

SIP
Simplex Ideal™ Peerless

Peerless™ 3000 & 4000 Operating Manual



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1. Introduction

1.0 Introduction

Thank you for selecting the Simplex•Ideal•Peerless Reel Mower Grinder. The Peerless 3000 Grinder is designed and built from top quality materials and components by people who care, and it will give you decades of service.

Please take a few minutes to register your grinder on our web site www.sipgrinder.com so that we can provide you better service and support.

1.1 Safety guidelines

The following are general safety guidelines. Please read and understand these guidelines before proceeding. As is the case with most machinery, failure to operate it in a safe manner may result in damage, injury or loss of life. Please be careful.

1. Always close shield or wear safety glasses and face shield when grinding!
2. Keep all guards in place and functioning.
3. Do not wear any loose clothing or jewelry which may get caught in the machinery. Secure long hair.
4. Keep your work area clean and organized.
5. Set up the work properly, using the correct tools and fixtures. Ensure that work is securely clamped.
6. Use the wrenches provided when changing the grinding wheel and always ensure that the nut is tight. Do not overtightening as that may damage the grinding wheel.
7. Always replace damaged grinding wheel.
8. Never leave grinder running while unattended.

In addition to the safety guidelines just listed, there are safety notices through out this manual which are denoted as follows:

An Information Notice provides information or a caution where minor damage may occur.



***Running the spin motor too fast
may damage the indexer.***

A Warning Notice indicates a situation which could cause severe damage, serious injury or death.



***Always close shield or wear safety glasses
and face shield when grinding.***

A Danger Notice indicates a very dangerous situation which if continued will cause severe damage, serious injury or death.



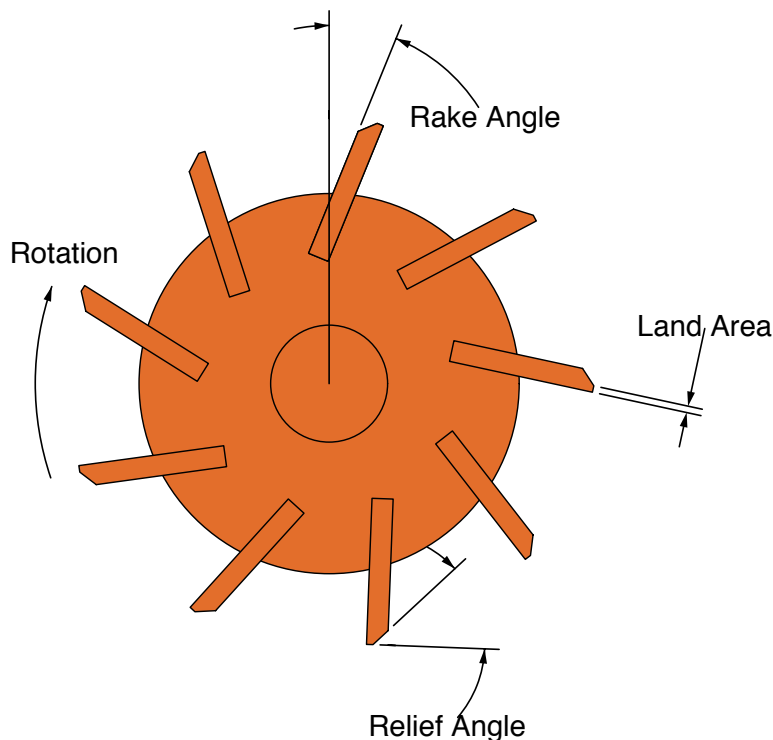
***Do not overtighten the nut as it will cause
the grinding wheel to explode!***

Again, make sure that you read and understand these warnings before proceeding because failure to operate any machinery in a safe manner may result in damage, injury or loss of life.

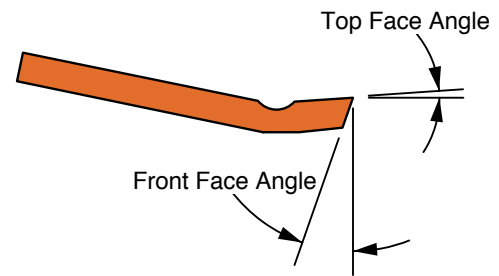
1.2 Principles of sharpening

The reel type lawn mower cuts grass using the principles of shears. It is necessary, therefore, to have two sharp cutting edges making close enough contact to cut the grass cleanly. This is the least harmful method of mowing grass, because each blade of grass is supported by the bed knife while the reel blade shears it off. This eliminates bleeding and brown tops which occur when the grass is whipped off with rotary type mowers.

On a five bladed reel mower, the bed knife does five times the work of any one reel blade as all the reel blades must shear against it. The bed knife, therefore, is the master cutting element and although made of heavier and harder steels, it is impossible to properly sharpen a mower with dull reel blades without sharpening the bed knife too.



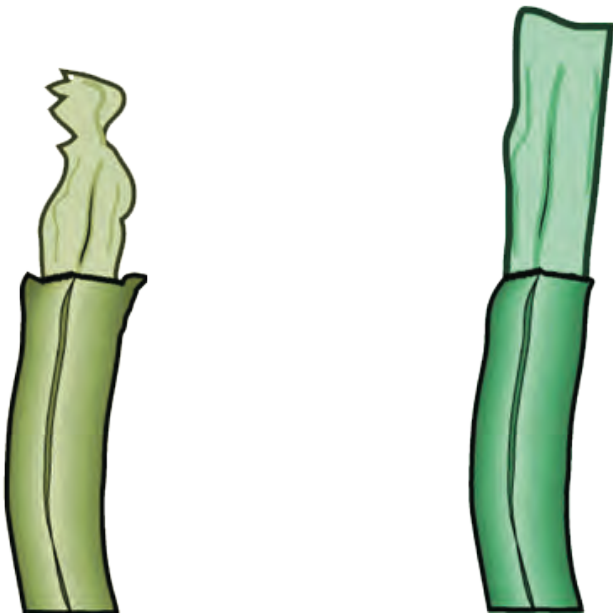
The figure above shows the different features of the reel mower blades. The reel blade **Relief Angle** reduces the contact area between the reel and the bed knife. It is created by individually relief grinding each reel blade. The **Land Area** indicates how much of the reel blade is contacting the bed knife and is created during spin grinding. The **Rake Angle** is set by the slot in the spider and ensures that the cutting edge is the first part of the blade to touch the grass blade. It can not be changed.



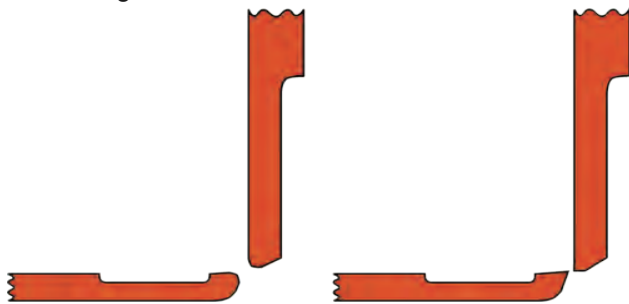
The bed knife **Front Face Angle** is used to support the blade as it is being cut. It does not need to be ground regularly as it does not wear and change shape. Bed knife life increases, however, by grinding both the top and front surfaces of the bed knife to eliminate the rounded edge. The bed knife **Top Face Relief Angle** provides reduced contact area between the reel blade and the bed knife blade. It also creates clearance for the cut grass and other materials. It is the wear surface on the bed knife and must be ground regularly to keep it straight and sharp.

For a mower to run easily and cut freely, it is important that proper bevel or relief angle be ground on both the bed knife cutting edge and the reel blades cutting edges. This gives clearance or relief behind the contacting edges and reduces drag and friction. Too little relief angle would leave more metal in contact causing the mower to run hard. Too much clearance or angle would weaken the cutting edges and they would nick easily and would not hold their edge.

1.3 Edge shape



If the mower is not cutting the grass cleanly, the cut end of the grass blade will appear torn and ragged. When a mower is brought in for servicing, it is important to determine why it is not cutting properly. Often, if the mower is operating satisfactorily in every respect except cutting the grass cleanly, it may only need an adjustment of the bed knife to the reel blades. Examination of the cutting edges and shearing corner on the reel blades and bed knife should determine if the mower needs a complete grinding job. Often, properly adjusting the bed knife is all that is required. Grinding the reel is necessary if any of the following conditions exist:



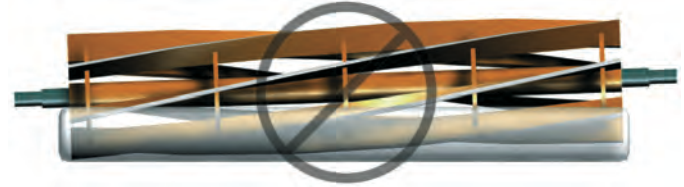
1. Significantly rounded blade edges.
2. Bent or nicked reel blades which cause streaking or irregular contact between reel blades.
3. Uneven blade wear.
4. Significantly cone shaped.
5. When all or most of the relief is worn away.

1.4 Reel shape

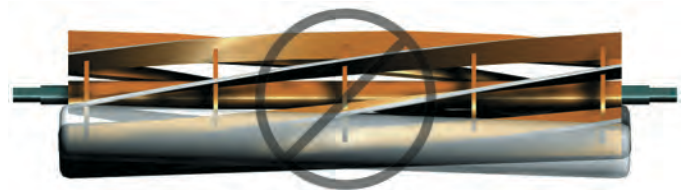
The process of sharpening a lawn mower is really one of reshaping the cutting edge of the bed knife and the reel blades by grinding, to restore their ability to cut grass. Equally important is the restoration of the match, or fit, of the reel blades to the cutting edge of the bed knife, against which all reel blades shear or cut. It is also important that the bed knife blade and the bottom of the reel blades are parallel to the bottom of the rollers and the rollers are parallel to each other. It is desirable for the reel to have little or no cone shape. This makes for a more even cut and minimizes ridges and lines in the cut and gouges in the turf.



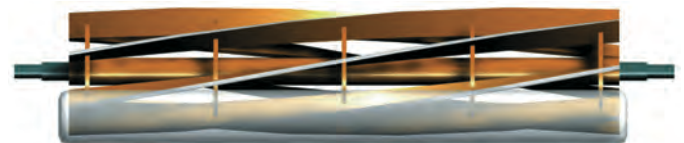
Through normal wear or improper grinding the reel will become cone shaped.



Conventional wisdom said that when you grind a reel, it should be ground into a true cylinder. This is true if both the front and rear rollers are adjustable. If one of the rollers is fixed and not parallel to the reel shaft, a cylindrical reel will result in an uneven cut. This is why it is important to always grind the bottom of the reel parallel to the bottom of the rollers.



It is also important that the rollers are parallel to each other. If they are not, the reel will rock and give an uneven cut or gouge the turf.



Only the Peerless grinders are designed to grind the reels parallel to the rollers and make it easy to parallel the rollers to each other.

1.5 Limited One Year Product Warranty

SIP Corporation warrants the grinder against defects in materials and workmanship for one year from date of original purchase. SIP Corporation will, at its option, repair or replace the defective part at no charge provided it is returned during the warranty period, with transportation charges prepaid, to our factory. Proof of purchase may be required.

This warranty is subject to proper use and maintenance in accordance with all instructional material and manuals provided with the grinder.

This warranty does not apply if the product has been damaged by accident, abuse, misuse, or misapplication; if the product has been modified without written permission of SIP Corporation or if the serial number has been removed or defaced.

This warranty applies only to the original purchaser.

The warranty and remedies set forth above are exclusive in lieu of all others, whether oral or written, expressed or implied. SIP Corporation specifically disclaims any and all implied warranties, including without limitation, warranties of merchantability and fitness for a particular purpose.

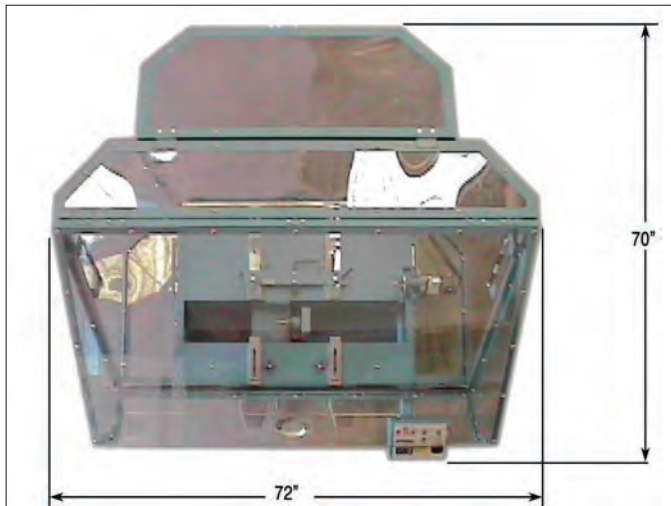
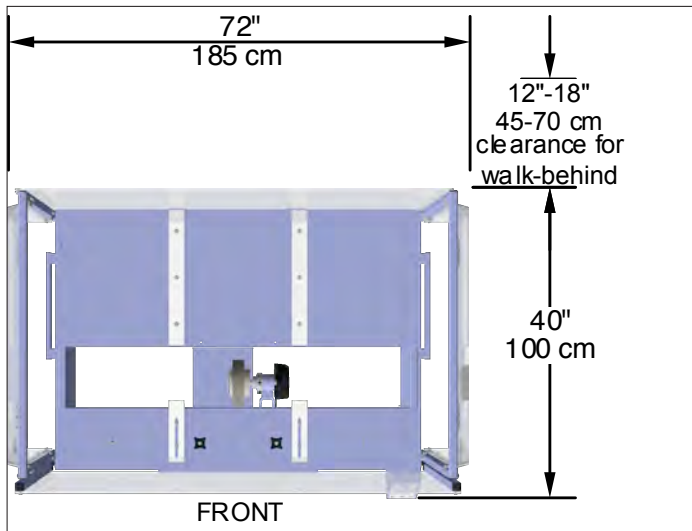
No SIP Corporation dealer, agent or employee is authorized to make any modification, extension or addition to this warranty.

SIP Corporation is not responsible for special, incidental, or consequential damages resulting from any breach of warranty, or any other legal theory, including but not limited to lost profits, downtime, or goodwill.

Some states do not allow the exclusion or limitation of incidental or consequential damages or exclusion of implied warranties, so the above limitations or exclusion may not apply. This warranty gives you specific legal right and you may also have other rights that vary from state to state.

You must obtain prior authorization before returning defective parts to SIP Corporation.

2. Installation and Set Up



2.0 Locating the grinder

Determine where on a concrete slab the grinder will be located. The reel mounts on top. The operator loads and works from the front. Adequate working area must be provided around the reel grinder.

The Peerless requires standard 110 volt, 60 Hz, single phase service. Foreign versions with 200 volt, 50/60 Hz, single phase are available. The grinder comes with an 8 foot grounded cord for 110 volt service. The grinder also requires about 70 psi clean compressed air.

2.1 Unpacking the grinder

While unpacking, examine carefully for any shipping damage. Any damage should be reported immediately to the carrier.

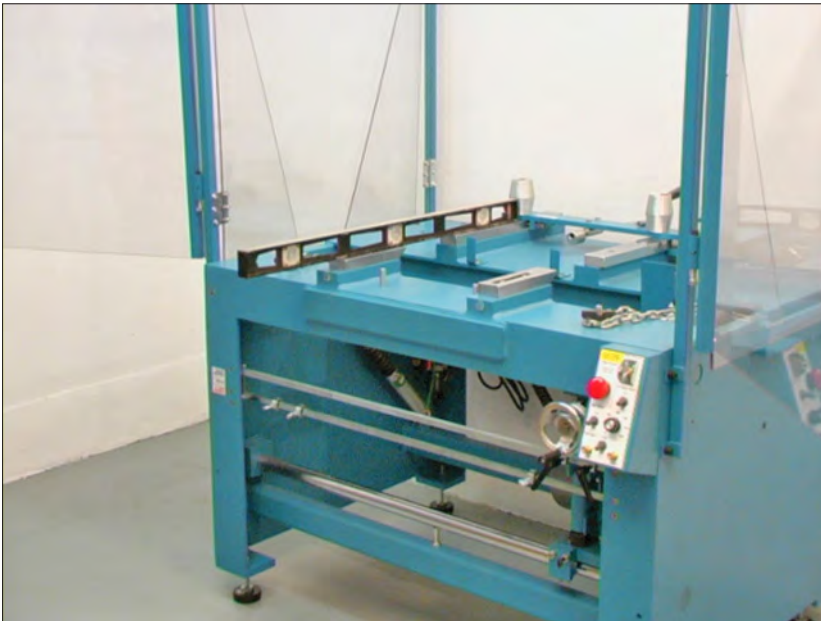
By now you have removed the plastic wrap from the main crate. After removing the box of accessories and any other optional equipment, unbolt the grinder from the pallet and place it in the location you have selected.





2.2 Leveling the Base

Mount the leveling pads provided in to the four corners of the grinder.



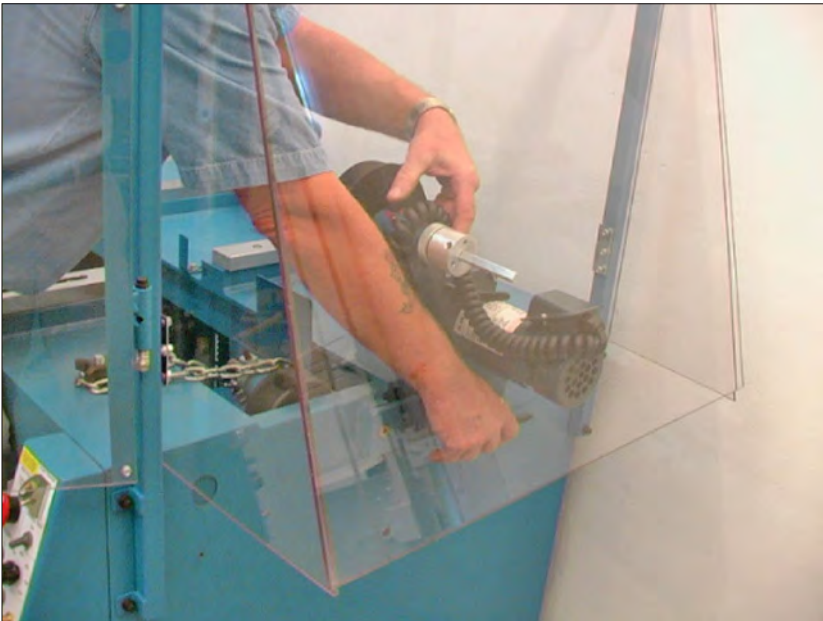
With the grinder in its final location, use a good quality carpenters level to adjust the leveling pads until grinder is level.



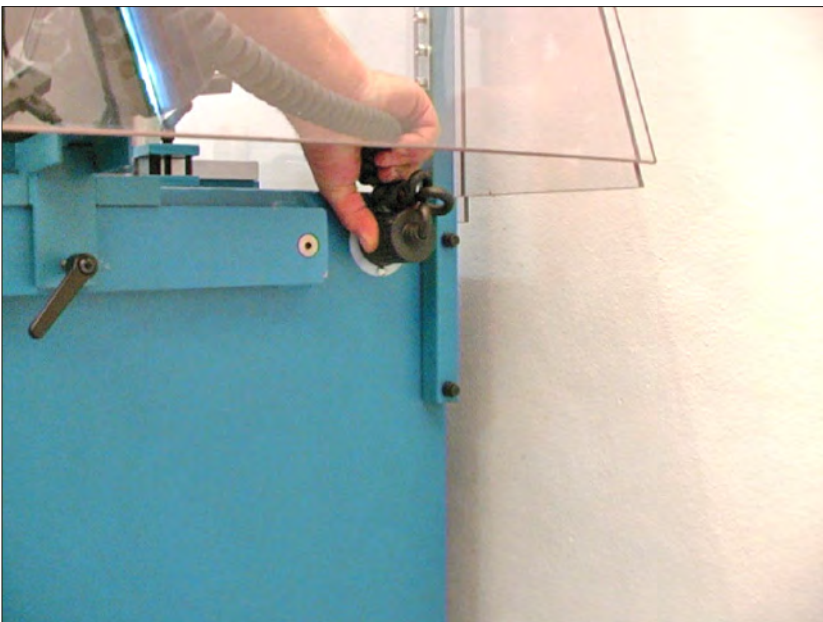


2.3 Mounting the spin motor

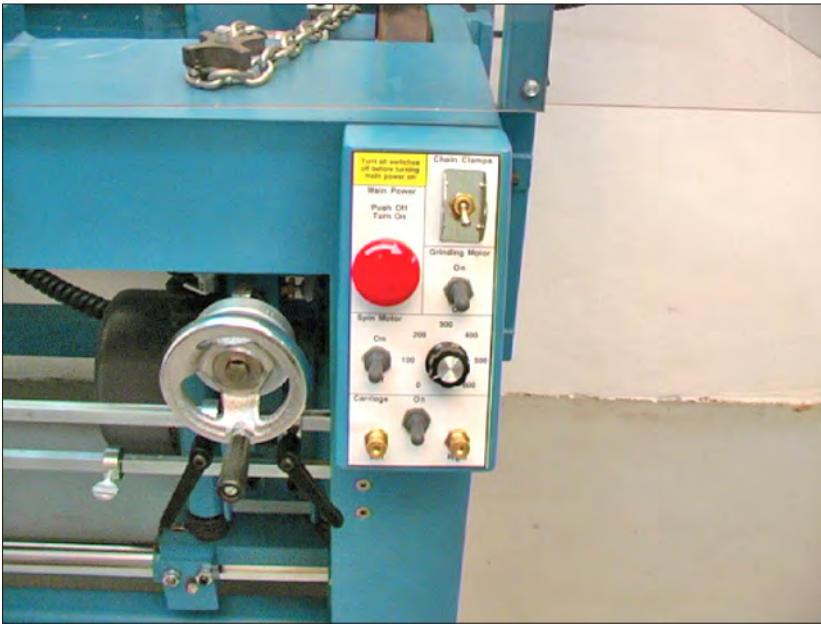
Unpack the spin motor from its box.



Mount the spin motor on its support rail on one end of the grinder. Clamp it in place. The clamping knobs are ratchet style handles and can be adjusted by pulling out and turning.



Plug and twist the motor plug into its receptacle on the same side as the spin motor is mounted. The spin motor is smart wired so that it will always rotate in the correct direction. The cord is only long enough to plug the motor into the side on which the spin motor is mounted.

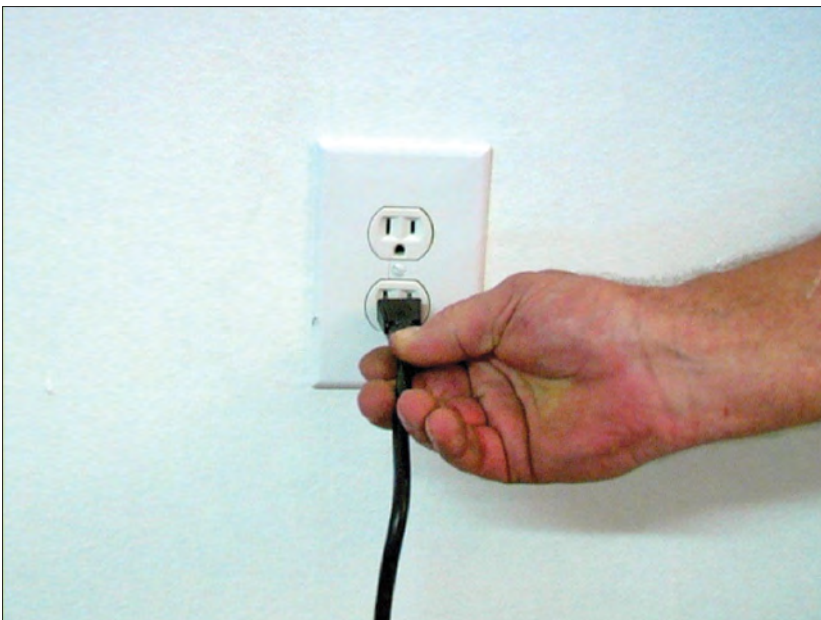


2.4 Connecting the service

Make sure that all of the switches are turned off.



Connect the air supply to the filter regulator and set the pressure gauge to 50 psi.



Plug the electrical cord into a 110 volt outlet.

3. Preparing to Grind

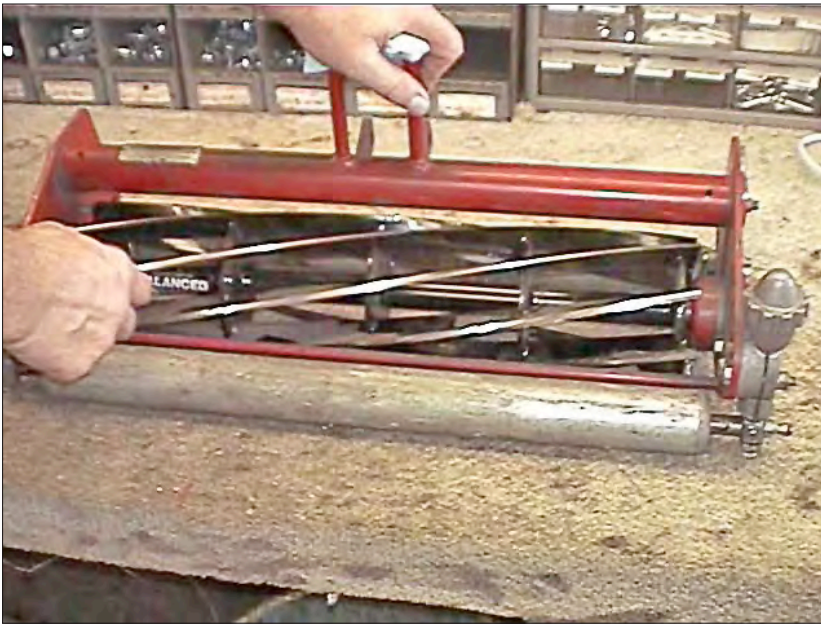


3.0 Preparing the reel mower for grinding

Clean all dirt, grass, rust, grease, and oil from the mower assembly, especially where it accumulates behind the lip of the bed knife.



Inspect for a wavy appearance or condition along the top face of the bed knife. This would indicate that the bed knife has been adjusted to the reel with excessive pressure. This could cause worn or loose reel bearings.

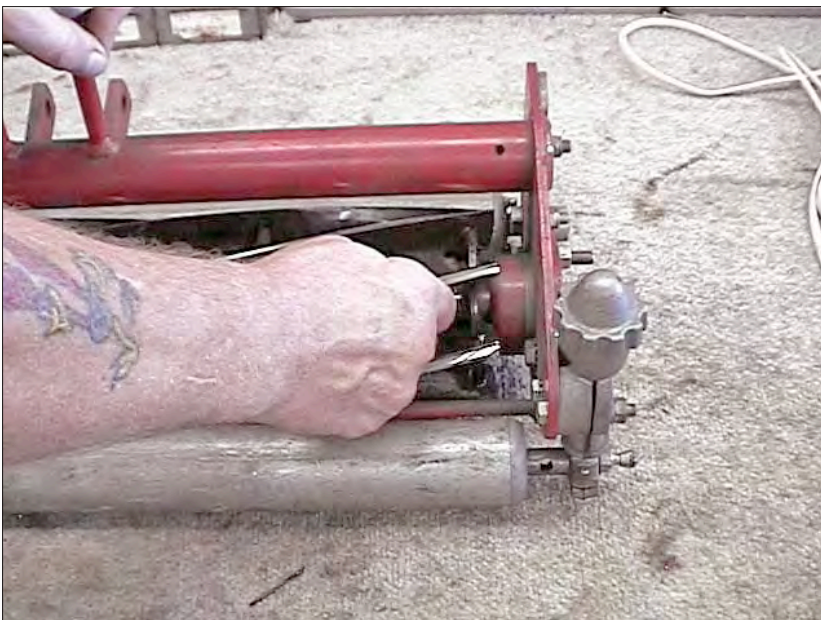


Check that the front spacer bar and that the bed knife is not loose. If the frame is loose, it is probably out of alignment. Check the mower manufacturer's manual to reset alignment.

Check the reel for free rotation and examine the reel blades for bad nicks that might indicate a twist or sprung spider.



Check to see that reel blades are securely fastened to the spiders and that the spiders are secure on the reel shaft. Repair as necessary.

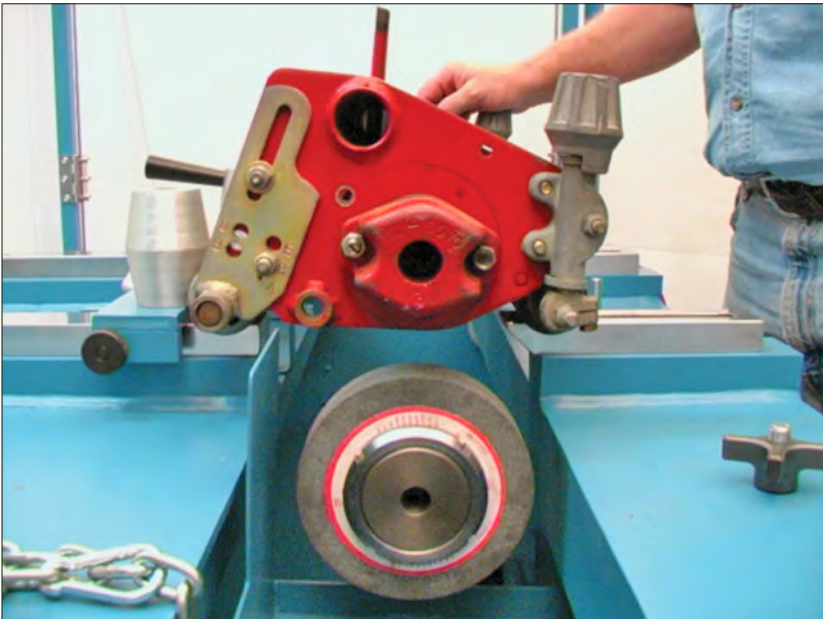


Check for axial and radial play in the reel bearings. Adjust or replace the bearings in accordance with the manufacturer's manual.

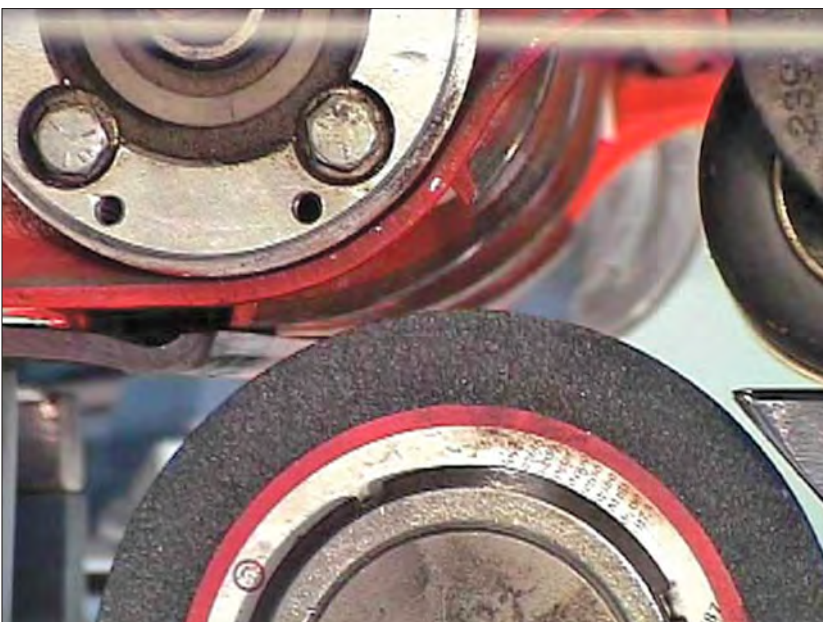


3.1 Mounting the reel mower for grinding

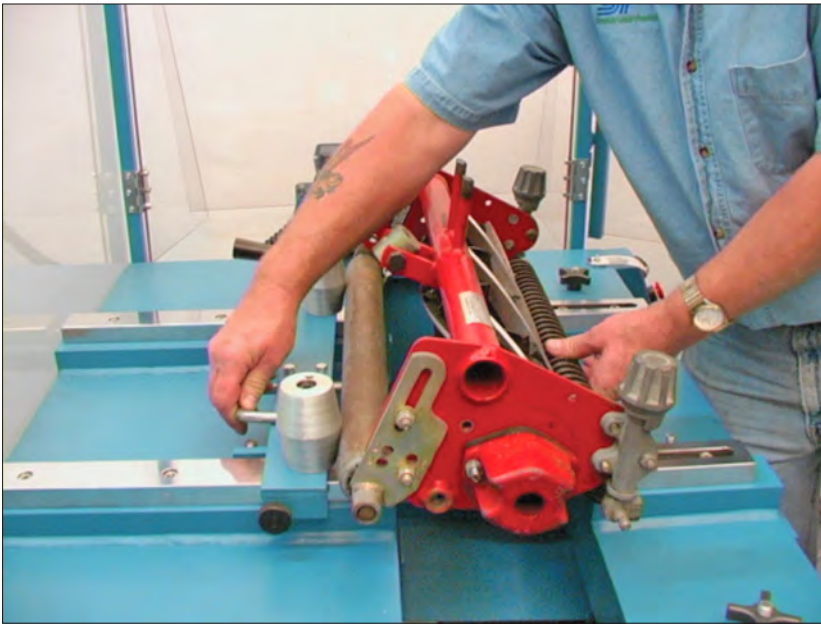
Place the reel mower on the reel support rails.



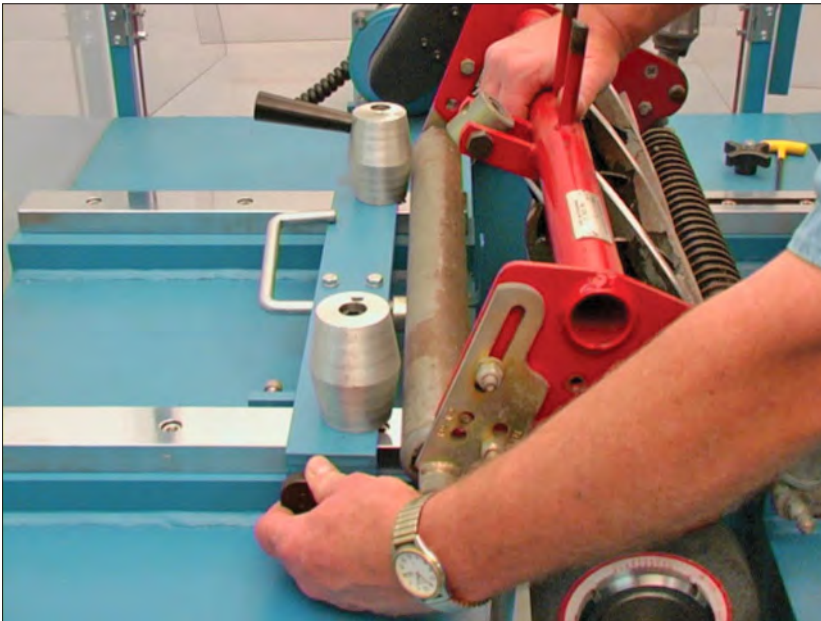
Position the reel front to back until the center of the reel shaft is above the center of the grinding wheel shaft.



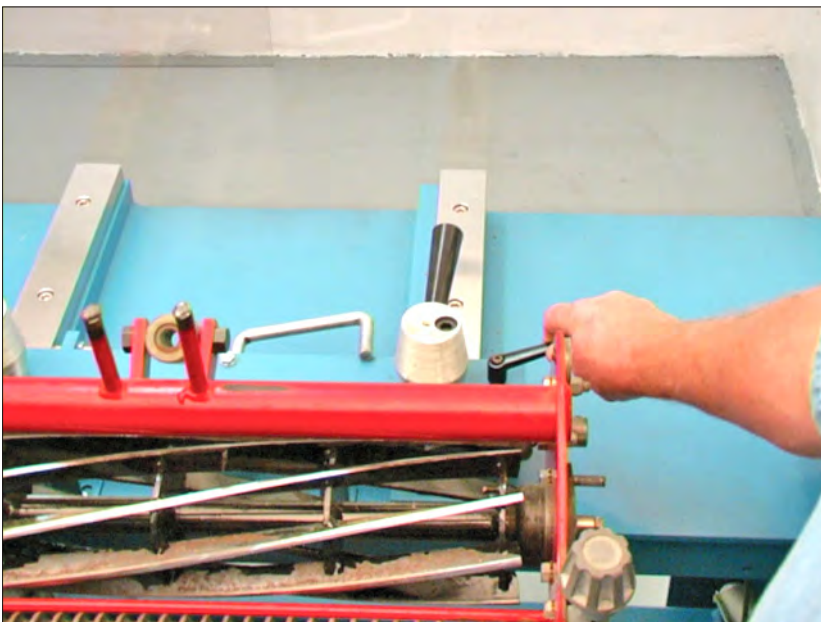
If you are grinding with the bed knife in place, locate the reel so that the grinding wheel will only grind the reel blades and clears the bed knife, front roller, and any other part of the reel. If you are going to relief grind, you will need to leave enough clearance between the reel blade and the bed knife for the relief grinding mechanism.



Bring the rear fence up to the rear roller.



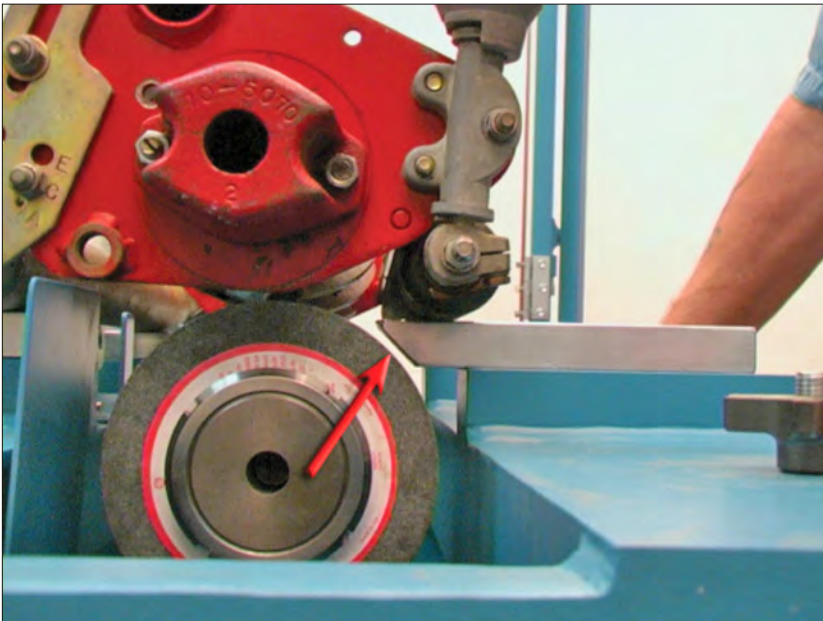
Lock down the left side making sure that the fence aligns itself.



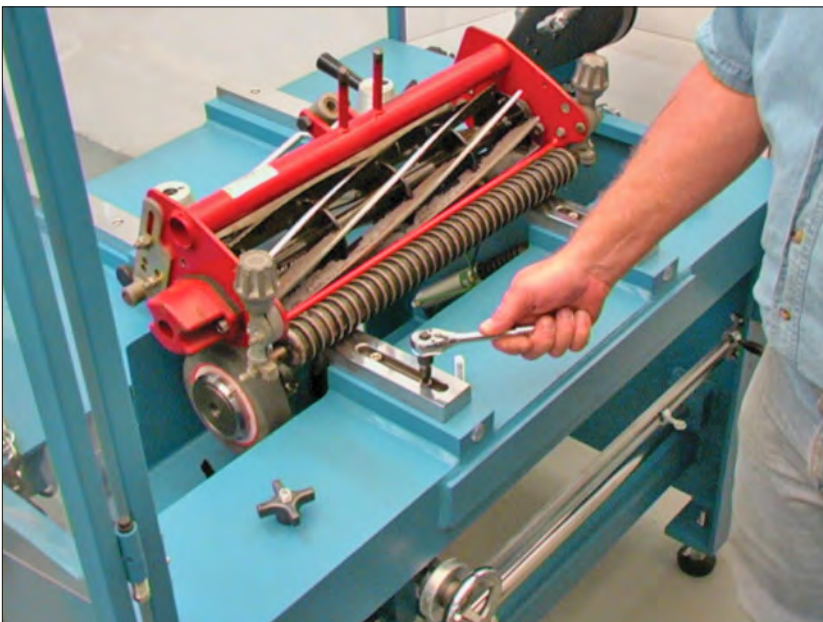
Lock down the right side. When doing a group of the same type of reels, the rear fence does not need to be moved.



Feed the grinding wheel up until it almost touches the reel blades.



Move the carriage past the reel support rails and make sure there is adequate clearance between the grinding wheel and the reel support rail.

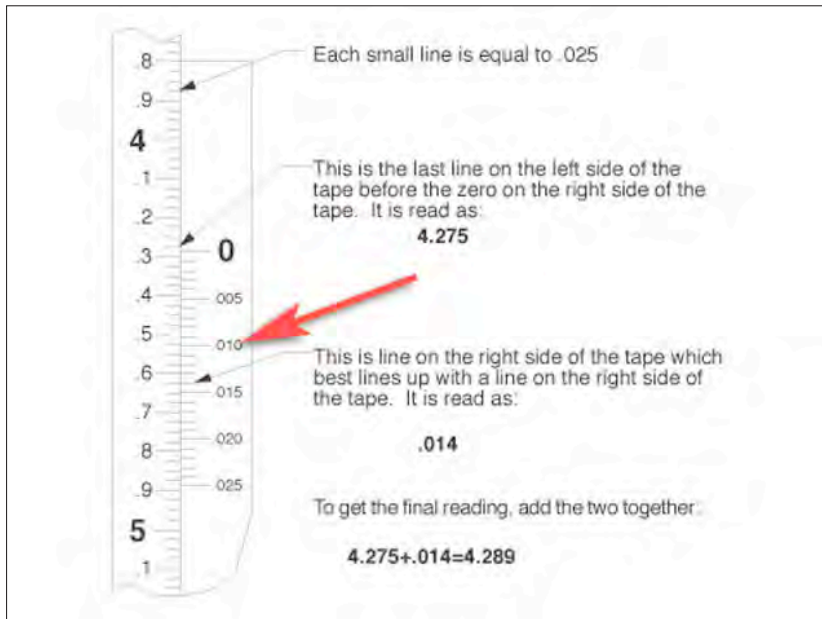
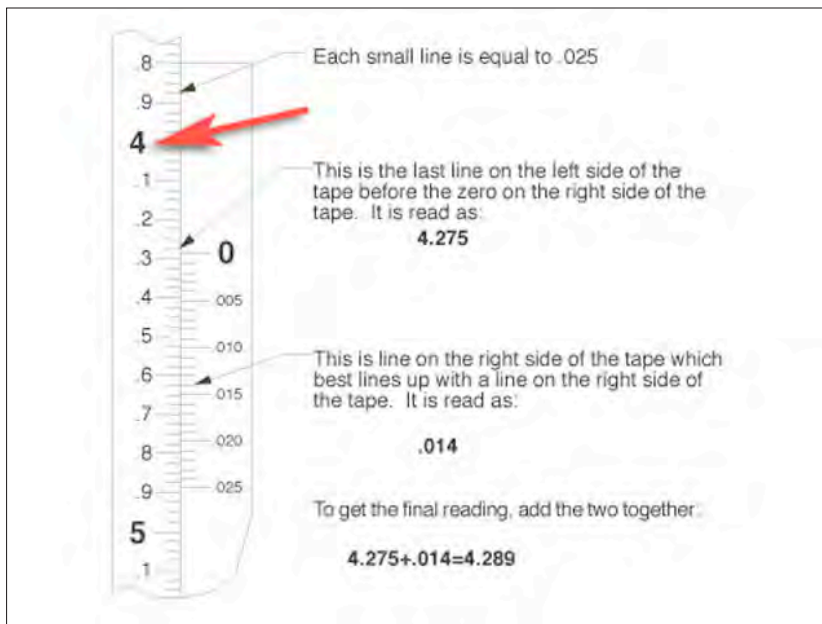


Make sure everything is secure. Loose equipment may cause damage.

If it does not, loosen the two socket head bolts in the front reel support rail and slide the rail back. Retighten the socket head bolts.

3.2 Pi tape basics

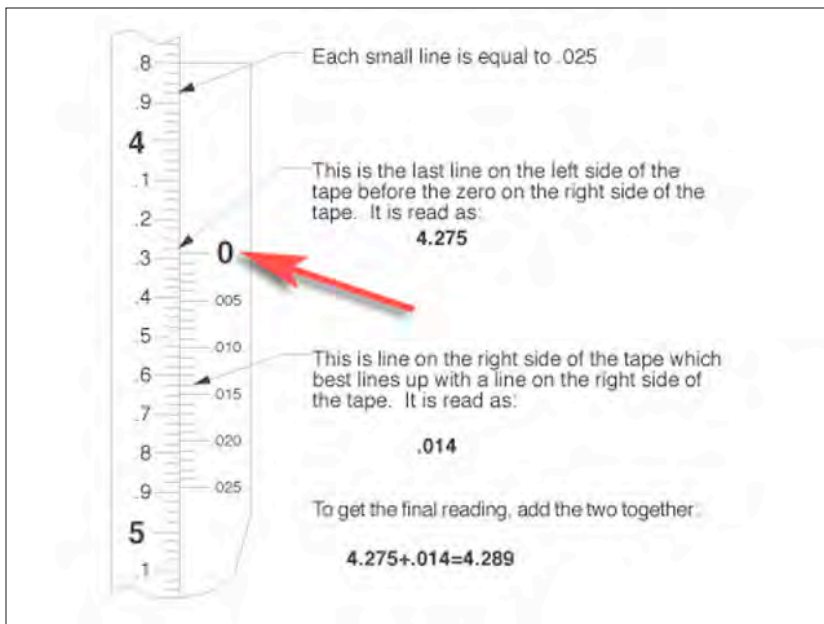
The pi tape measures the diameter of a reel by wrapping around the circumference. It is calibrated so that each inch is 3.142 inches long or pi (π) inches long. This will automatically convert the circumference into a diameter.



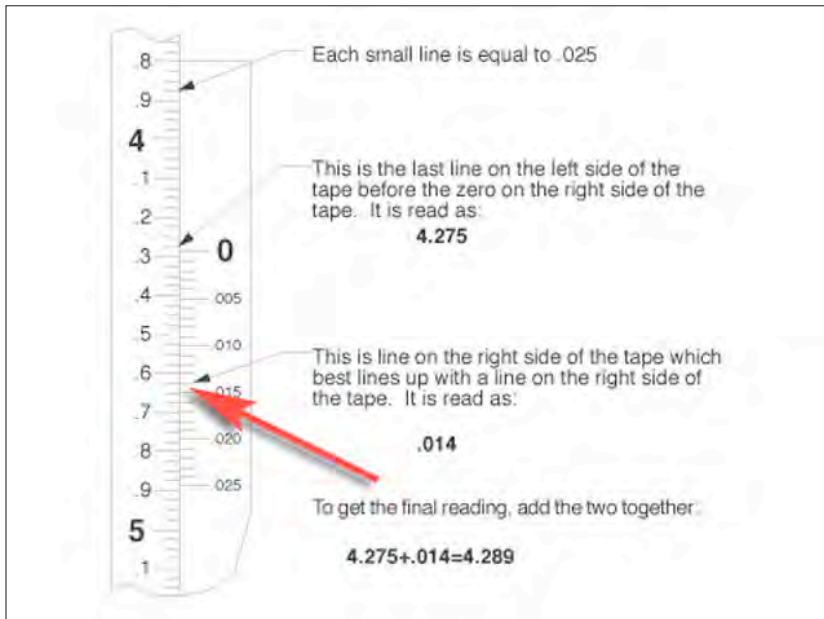
The pi tape also has a vernier, which makes it capable of measuring the diameter of the reel to .001 inches.



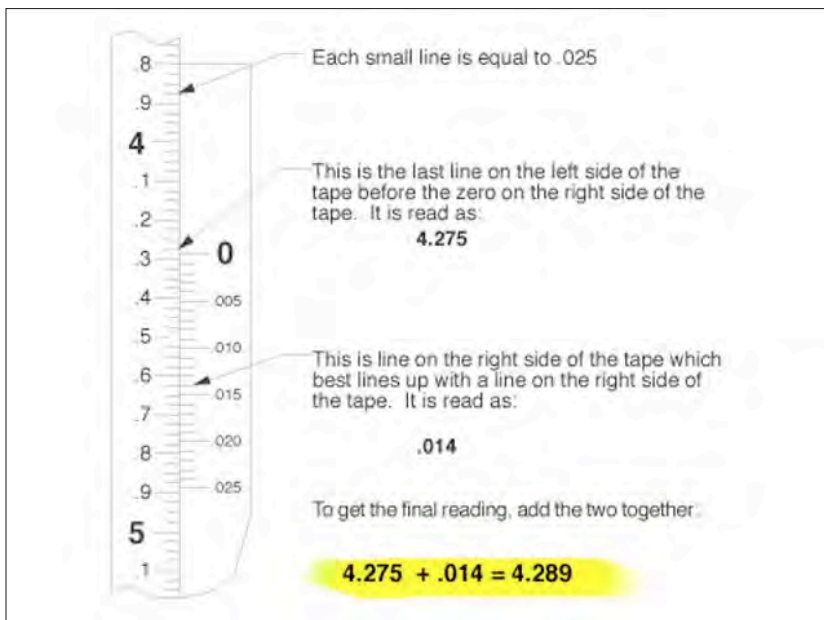
Make sure that the pi tape is tight and straight.



Locate the zero (0) on the right side or vernier side of the pi tape. Read the measurement just above the zero. Each large numbered line is 1 inch. Each small numbered line is .1 inches and each small line without numbers is .025 inches. The illustration at the left would then be 4.275.



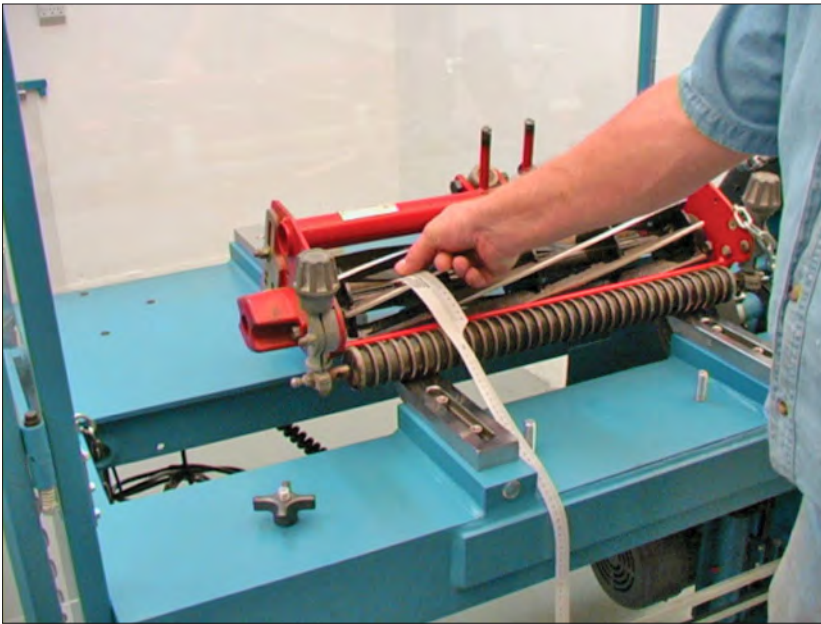
To read the vernier, find the two lines that best line up and read the number on the right side or the vernier side. This would be .014 in the illustration on the left.



Add together to get your final measurement.

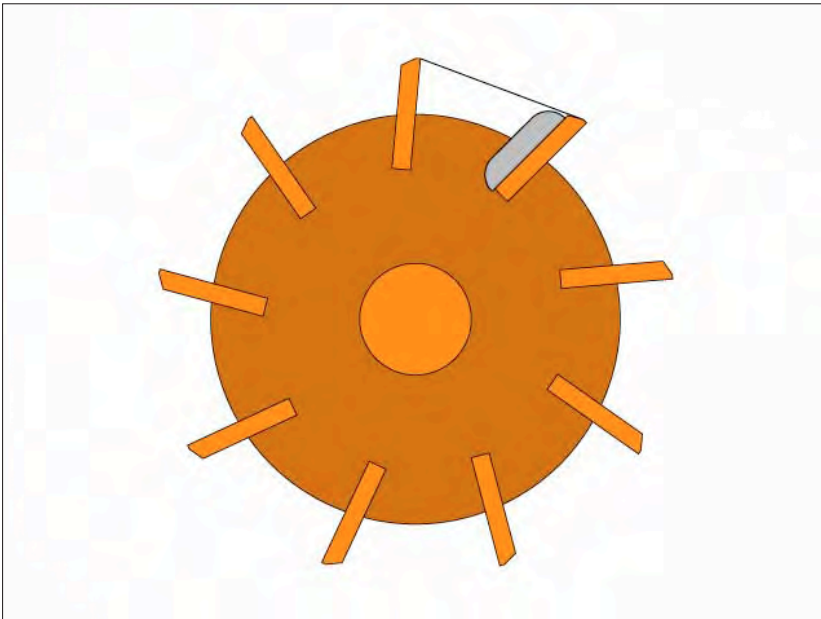
$$(4.275 + .014 = 4.289).$$

You should repeat each measurement you make at least once and until you duplicate the measurement within .003. The smaller the number is on any given measurement, the more accurate it is.

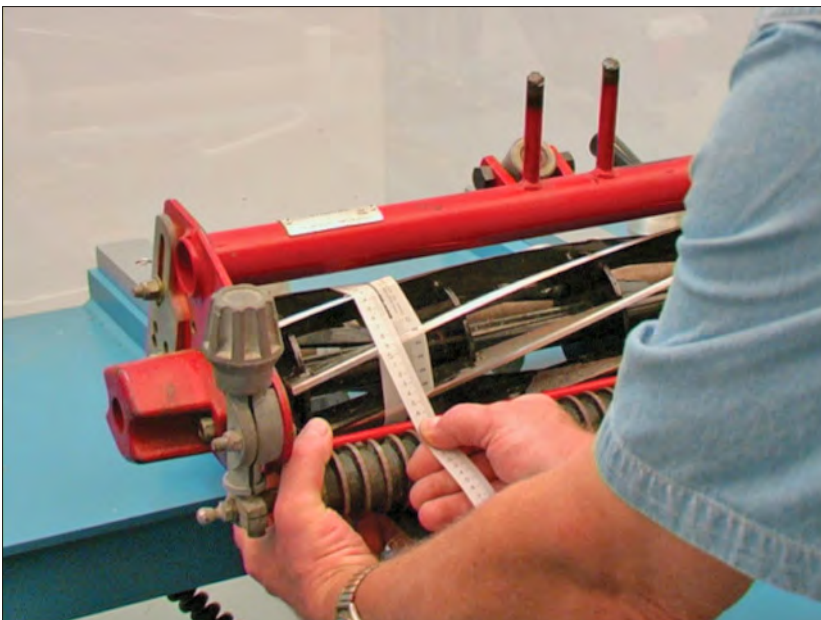


3.3 Measuring the reel

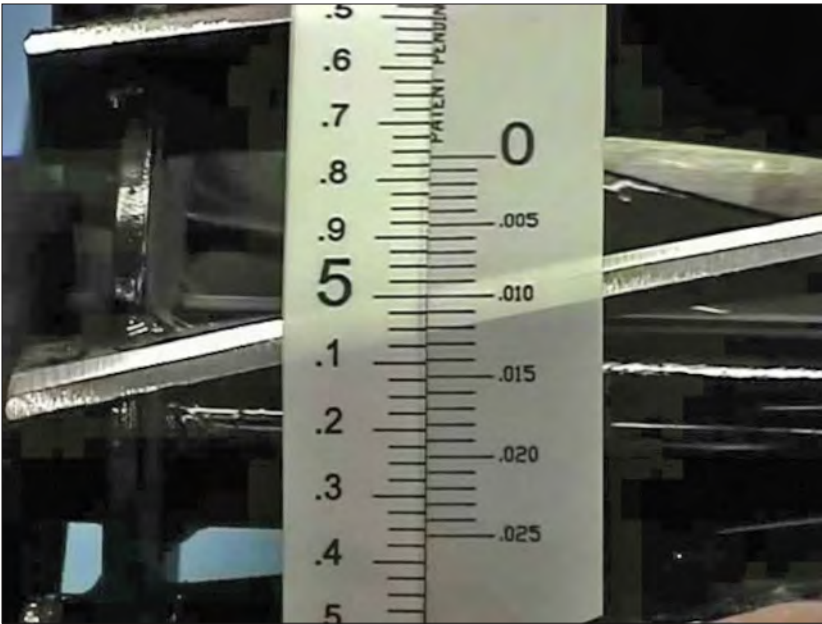
Place the magnet of the pi tape on a blade at the left end of the lawn mower.



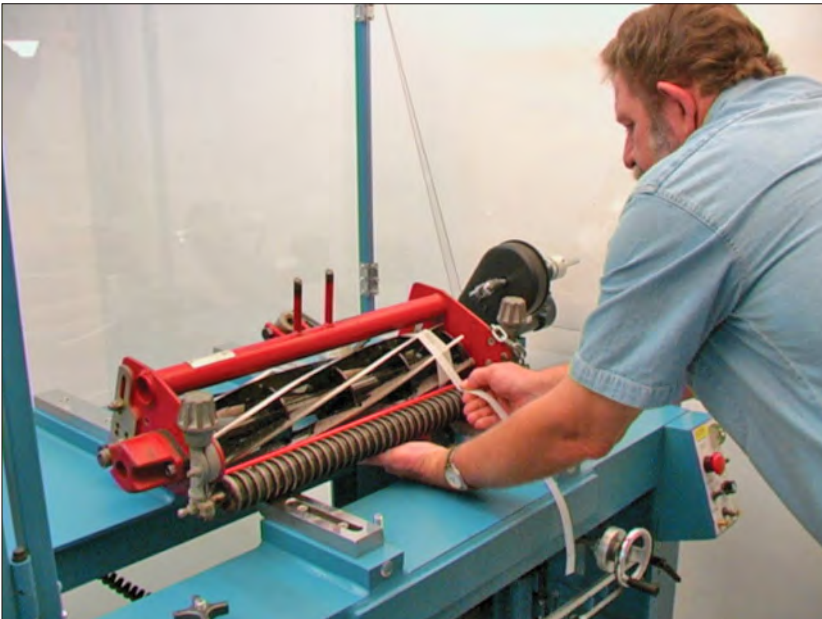
Make sure that the magnet does not extend beyond theoretical line drawn between two blades.



Keep tension on the pi tape as you rotate the lawn mower and wrap the pi tape around the lawn mower.



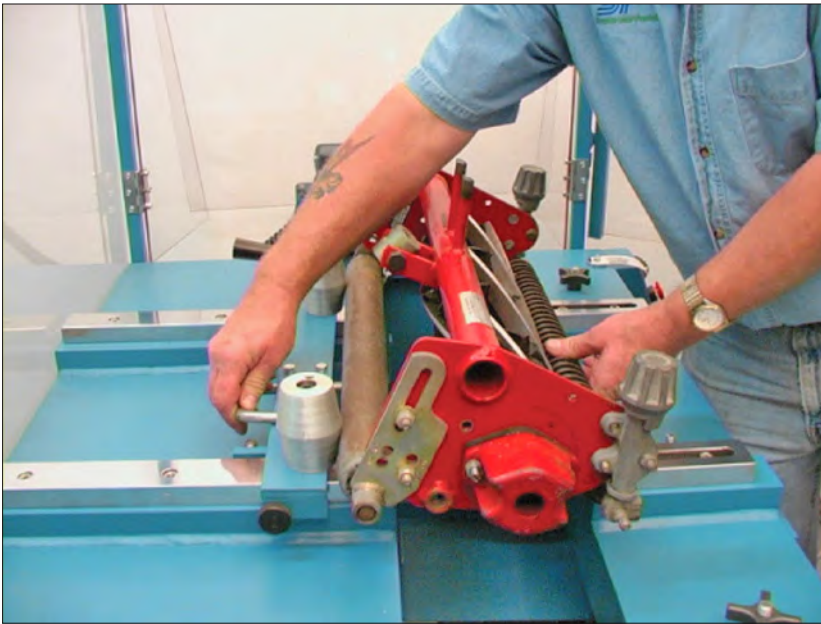
Make sure that you wrap it in a straight line so that the end of the tape lines up with the beginning of the tape. Note the lawn mower diameter (4.760 for example).



Place the pi tape magnet on one of the blades at the right end of the lawn mower. Again make sure that the magnet does not extend beyond theoretical line drawn between two blades.

Keep tension on the pi tape as you rotate the lawn mower and wrap the pi tape around the lawn mower.

Make sure that you wrap it in a straight line so that the end of the tape lines up with the beginning of the tape. Note the lawn mower diameter (4.770 for example).

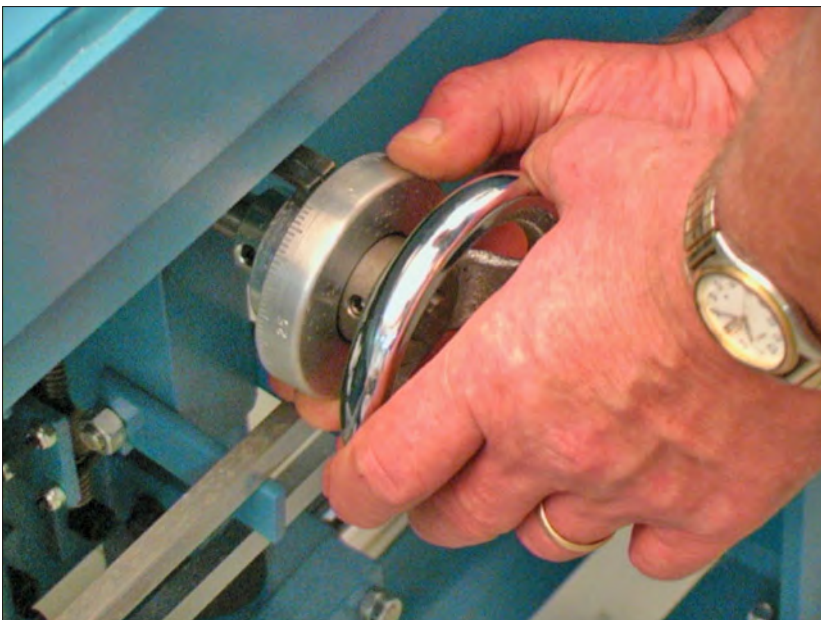


3.4 Adjusting the reel

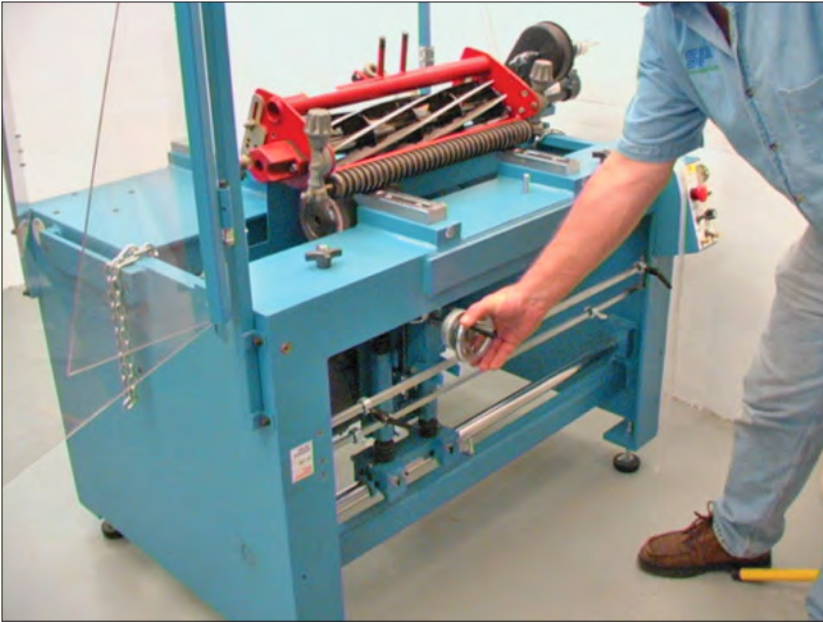
Lift the rear roller with the fence jack so that both ends of the front roller are on the table.



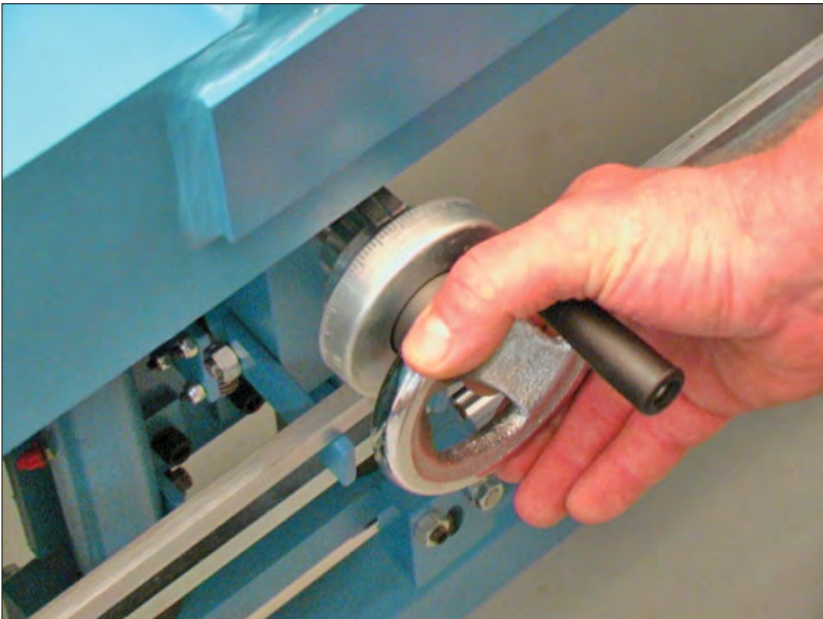
Feed the grinding wheel up at the large end of the lawn mower while turning the lawn mower blades and until the wheel just touches the lawn mower blades. You should do this at approximately the point you took your pi tape measurement.



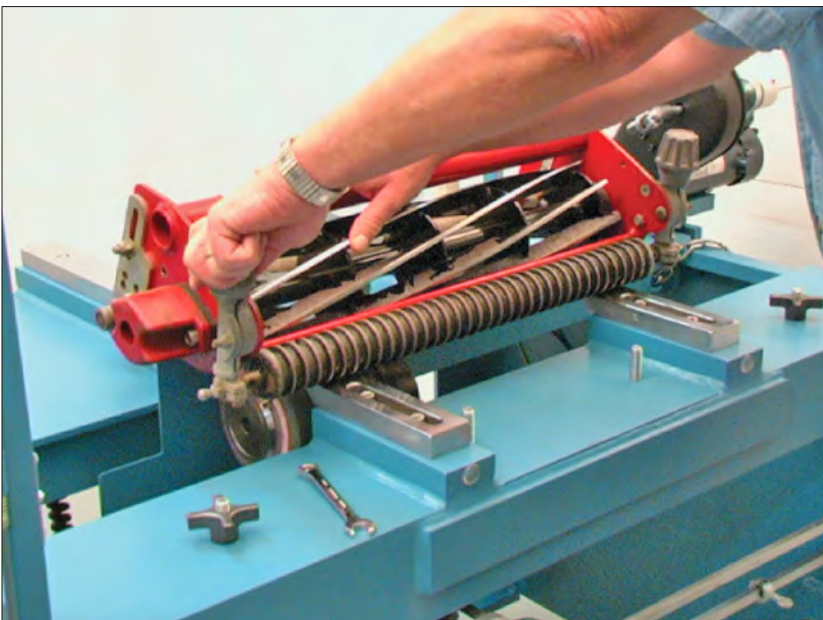
While holding the hand wheel, turn the dial until it reads 0.



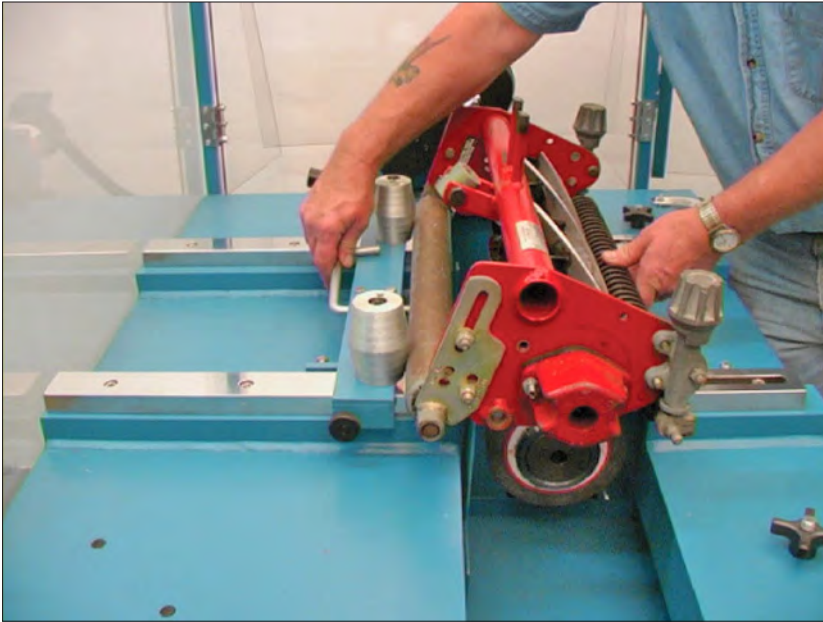
Move the grinding head to the small end of the lawn mower.



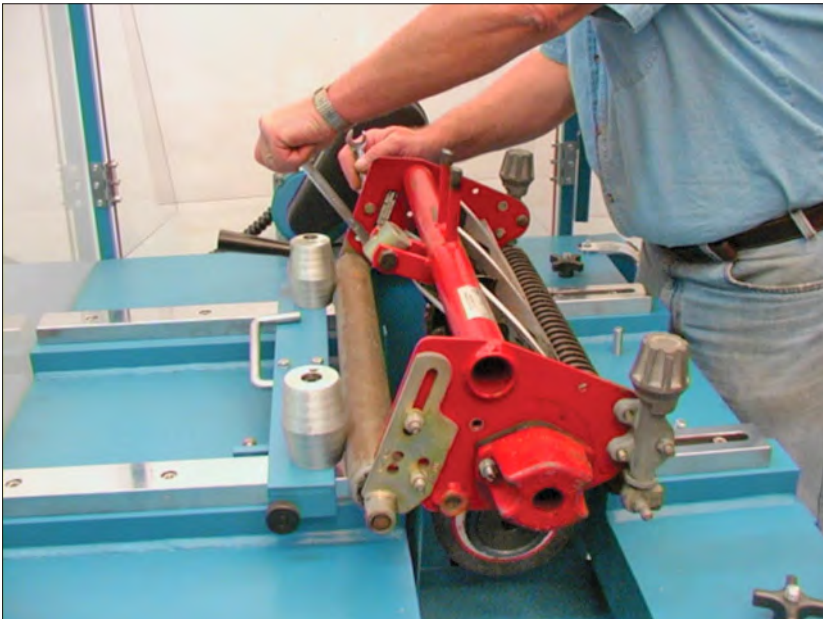
Infeed the hand wheel the difference in the left and right lawn mower diameters ($4.770 - 4.760 = .010$).



While turning the lawn mower blades, adjust the front roller until the grinding wheel just touches the lawn mower blade.



Lower the fence jack.



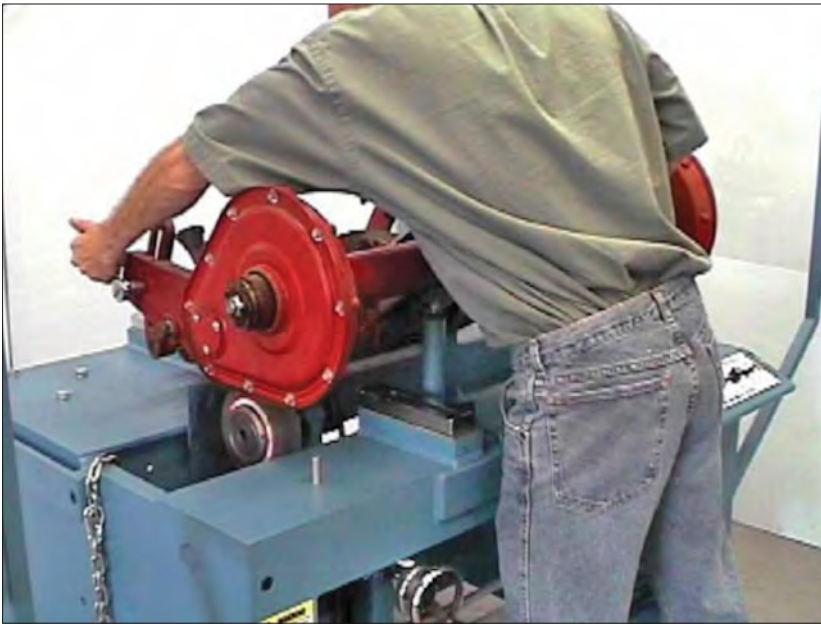
Adjust the rear roller until there is no rock.



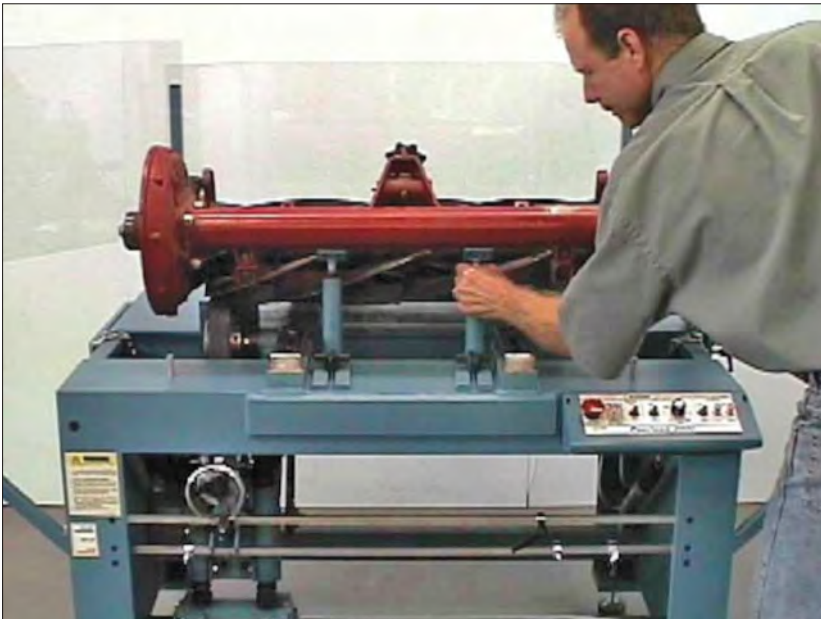
If the rear roller is fixed, you may adjust the front roller up to .010 to remove the rock, otherwise you need to adjust the frame.



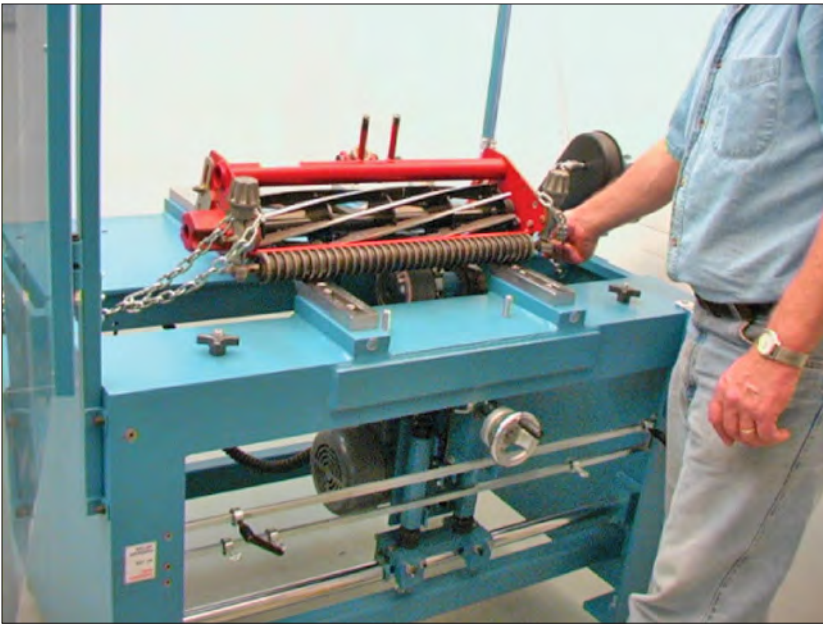
If you have lawn mower to bed knife adjustment, adjust the roller to remove the rock. Then make your adjustments using the lawn mower adjustments rather than the roller adjustments.



Use the support stands for lawn mowers without a front roller. To adjust the lawn mower, loosen the frame or roller mount.

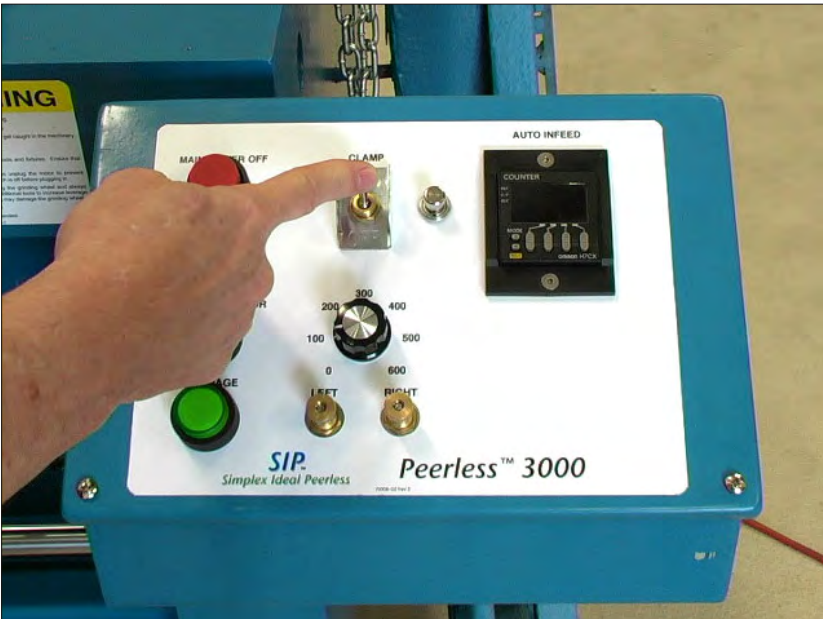


Adjust the support stands as necessary. Then retighten the frame or roller mount.

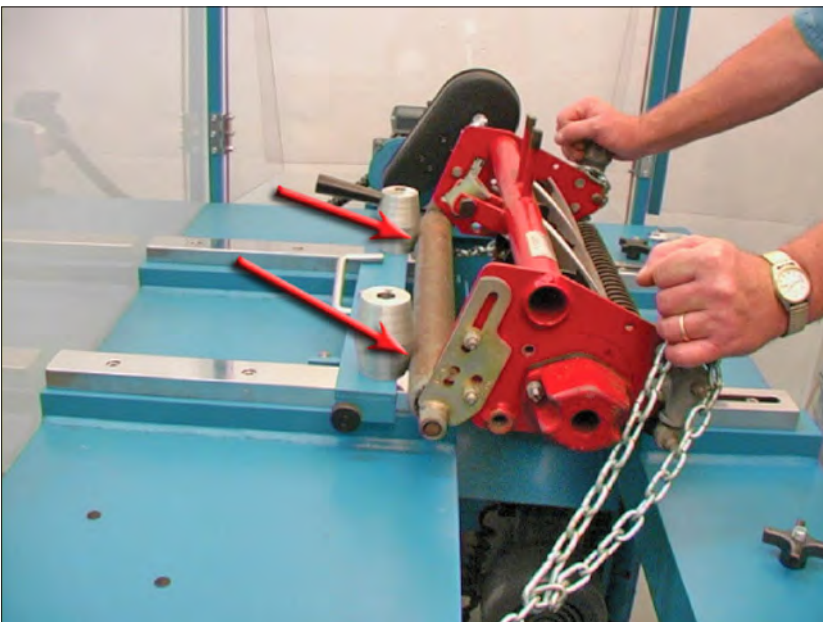


3.5 Clamping the reel

Loop the chains around the lawn mower frame.

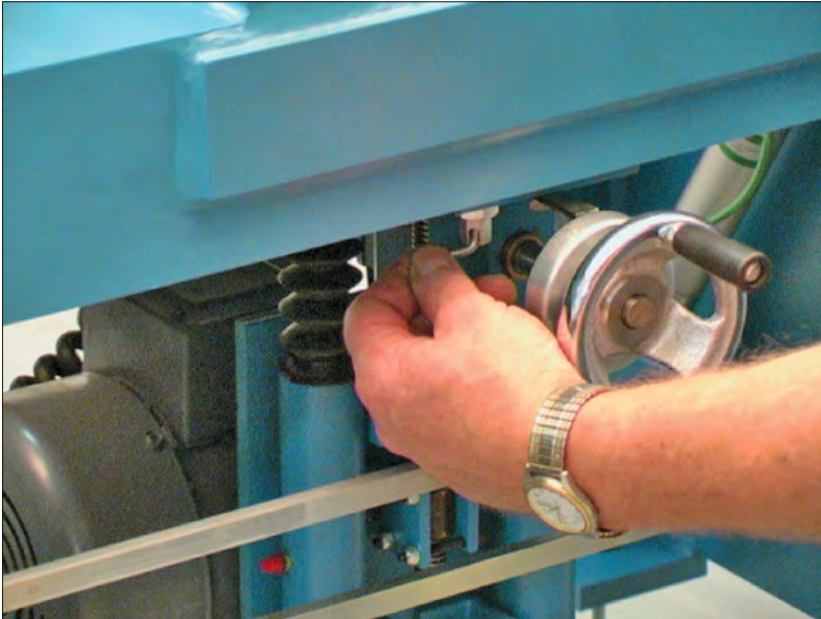


Turn the chain clamps on.



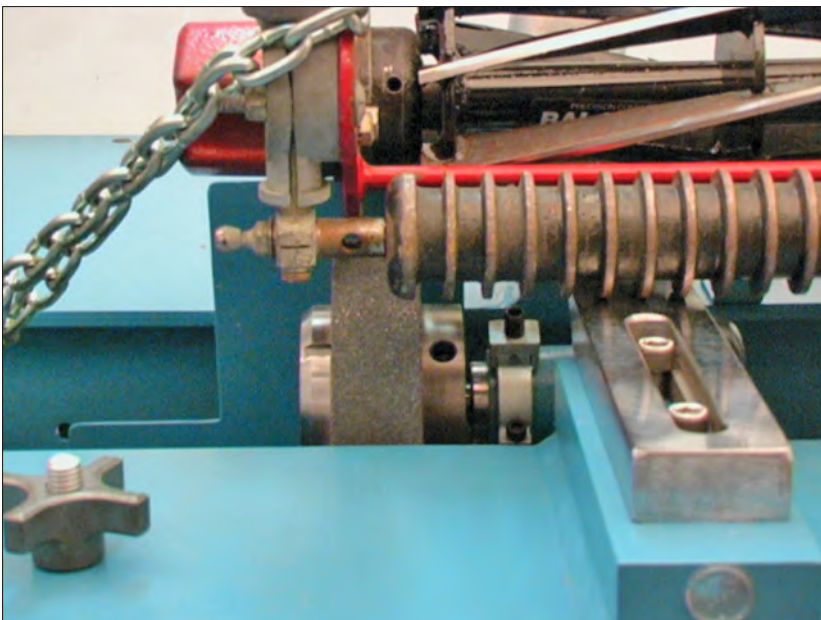
Make sure the lawn mower is properly seated and both chains are tight.

4. Spin Grinding

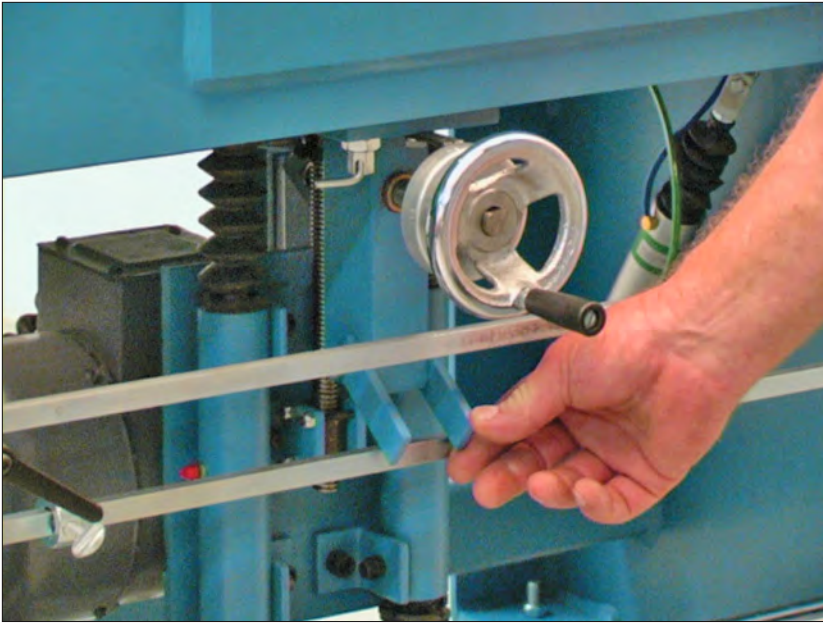


4.0 Setting the carriage stops for spin

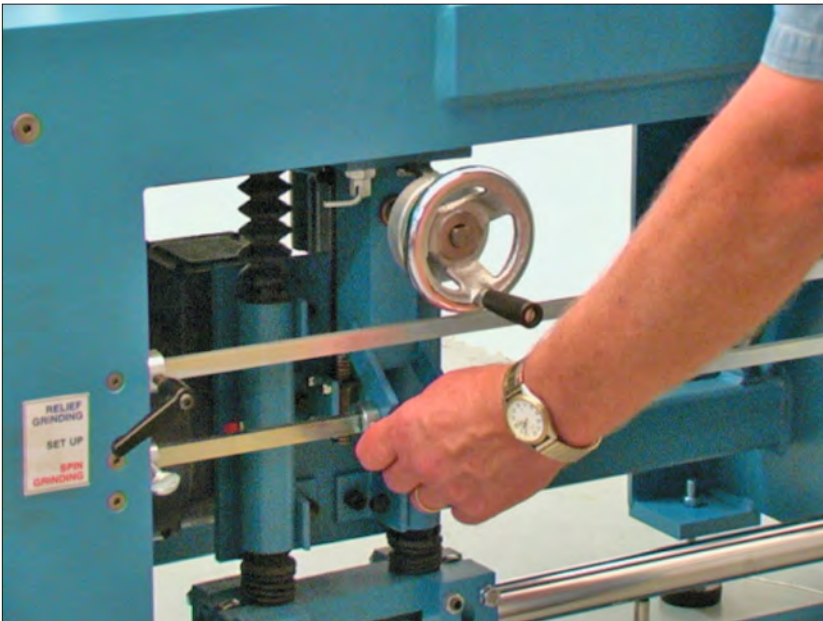
Disengage the grinding head from the carriage travel by pulling then turning the locking pin.



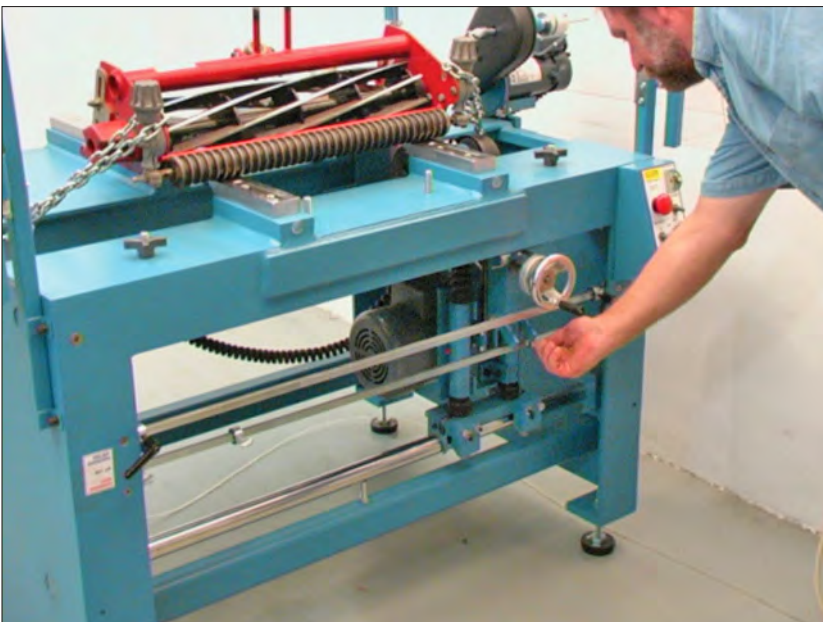
Move the grinding head to one end of the reel so that the grinding wheel is just off the end of the reel blade and does not touch the reel frame. If you can not clear the reel frame, you may leave all or part of the grinding wheel on the reel.



Move the stop levers to the down position.

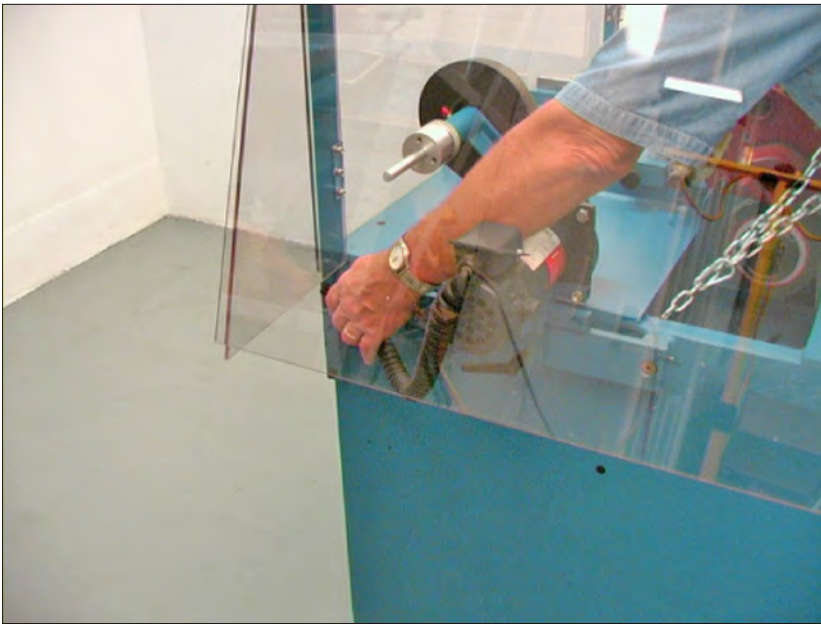


Loosen the clamp screw on the carriage stop and slide the stop so it touches the grinding head, then tighten the clamp screw.



Move the grinding head off the other end of the reel and set the stop for that end.

The third middle stop is for spin grinding conical reels. It can be set a few inches past where the grinding wheel stops grinding to shorten the stroke. As the grinding wheel increases the length of contact with the reel, the middle stop can be moved so that it is always a few inches past where the grinding wheel loses contact with the reel. When almost the whole length of the reel is being ground, the middle stop can be moved to the end. If you are going to use the middle stop, make sure you position the end stop to allow for the thickness of the middle stop.

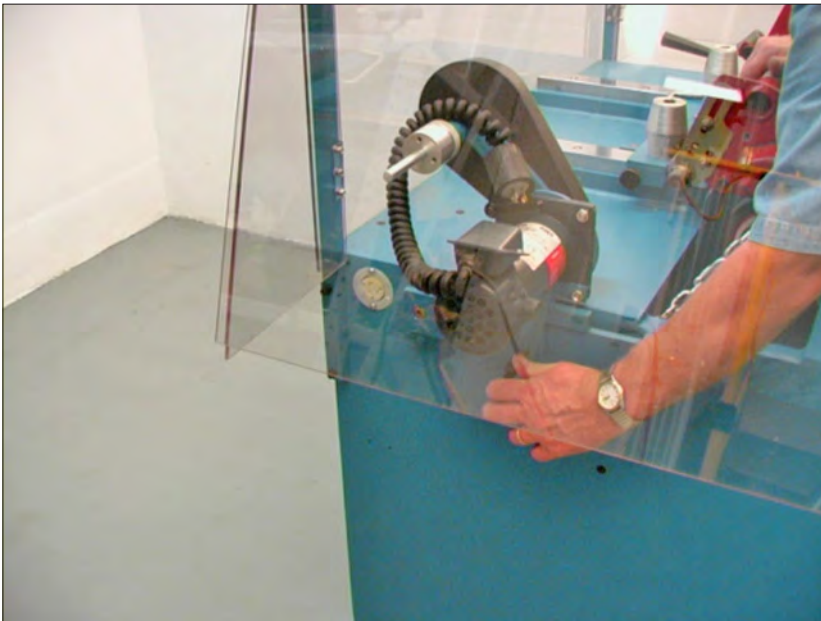


4.1 Engaging the spin motor to the reel



Make sure that all clamps are tight. Loose clamping may cause damage or injury.

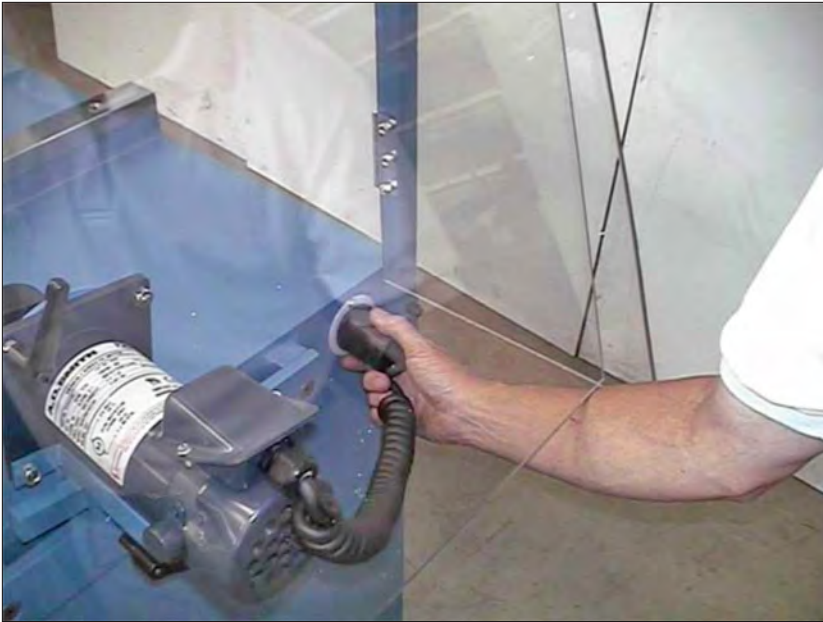
To change the side on which the spin motor is mounted, twist and unplug the spin motor plug.



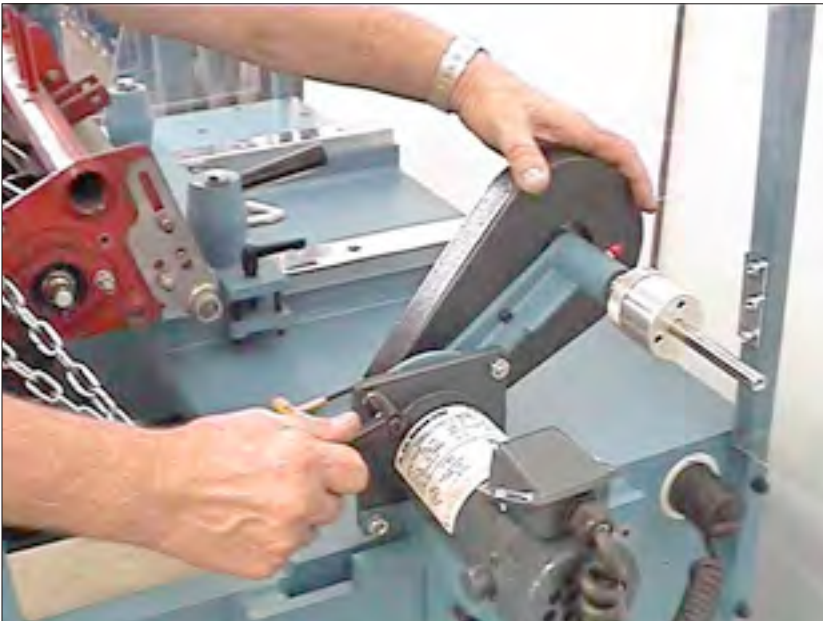
Hold the spin motor with one hand and loosen the locking knob which clamps the unit to its support.



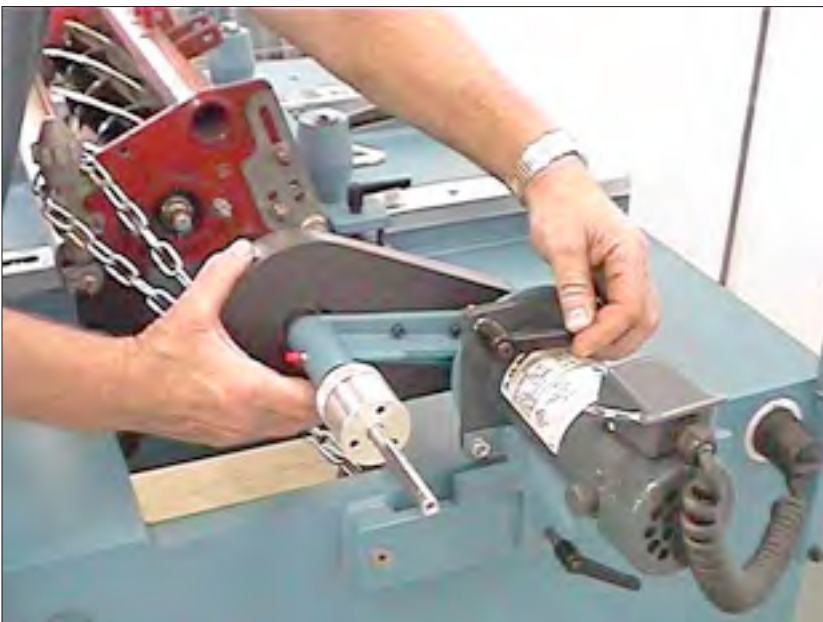
Lift the assembly off the support, turn it around, and place it on the support at the other end of the grinder.



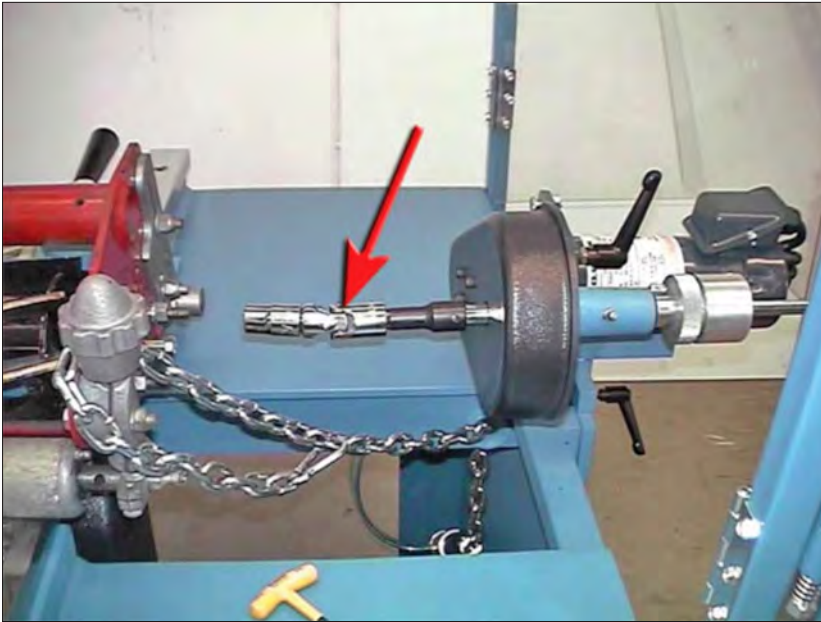
Plug and twist the spin motor plug in its receptacle on the same side as unit is mounted.



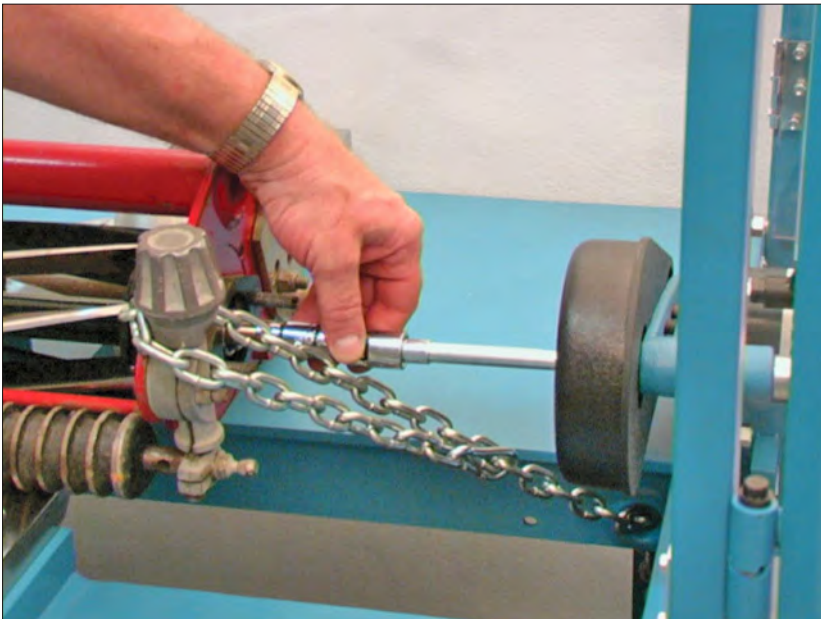
Unclamp the radius arm.



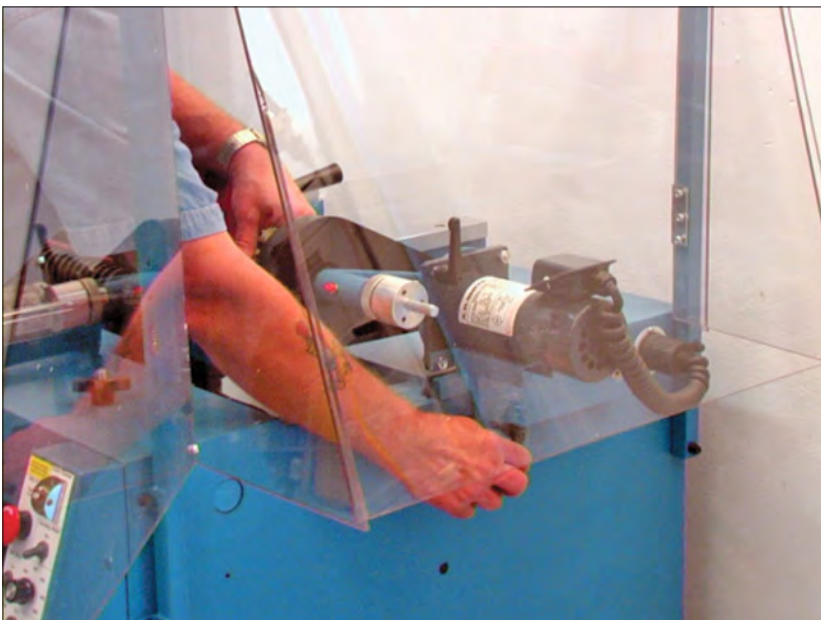
Swing the radius arm to the front.



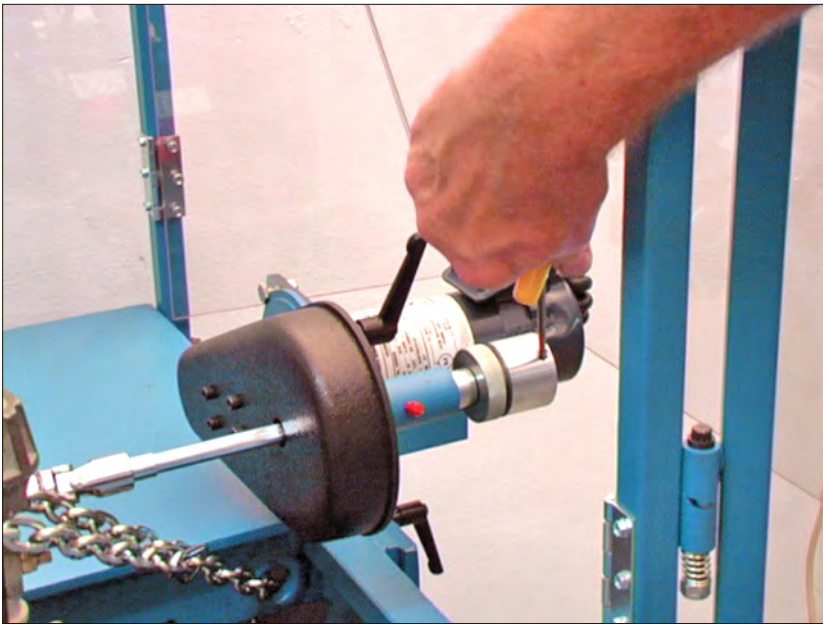
Select a 1/2" drive socket that will fit the drive of your reel mower and place it on the 1/2" drive shaft of the spin motor. Some mowers may require simple adaptors.



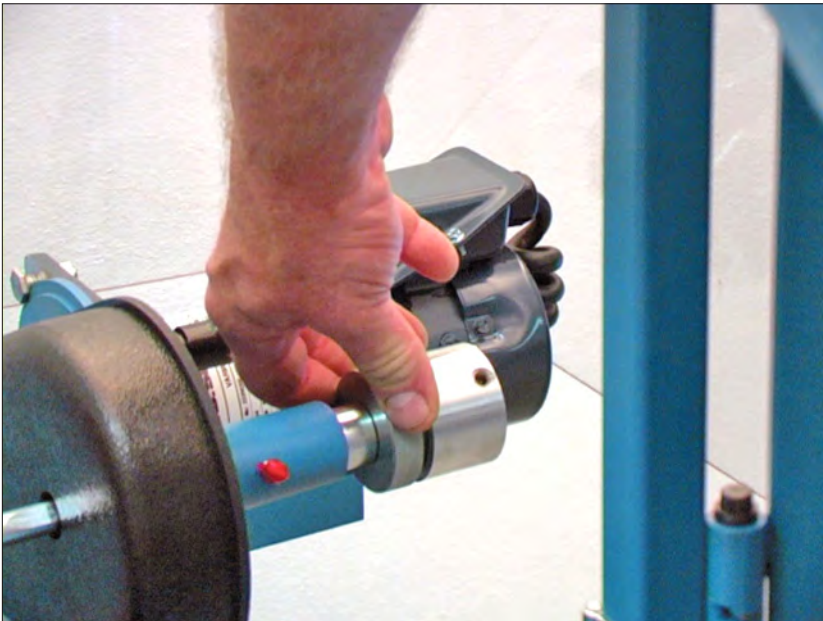
Position the socket so that it aligns with the drive on the reel.



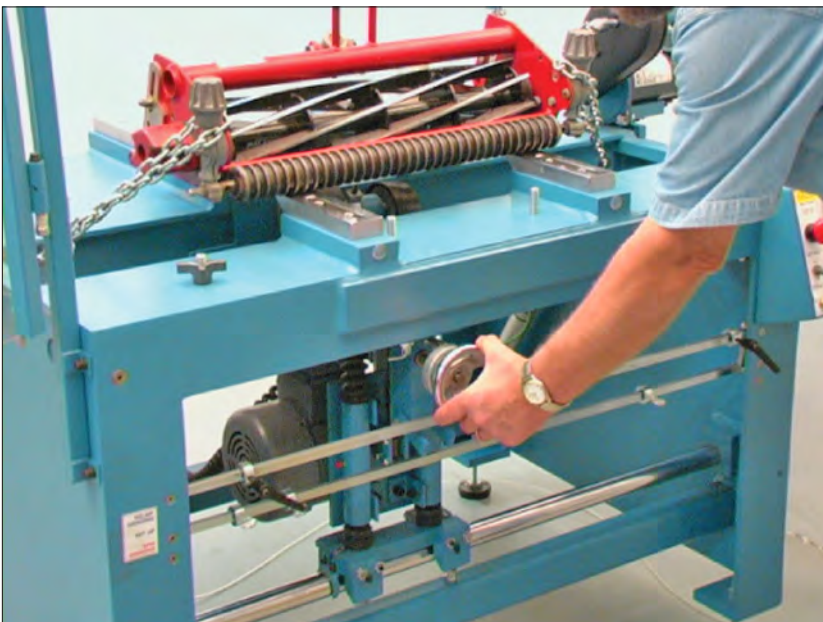
Lock the support and radius arm clamps.



Unclamp the setscrew which locks the spin motor shaft and slide the socket on to the drive on the reel, then retighten the setscrew.



Turn the knurled knob to the spin position to lock the clutch.

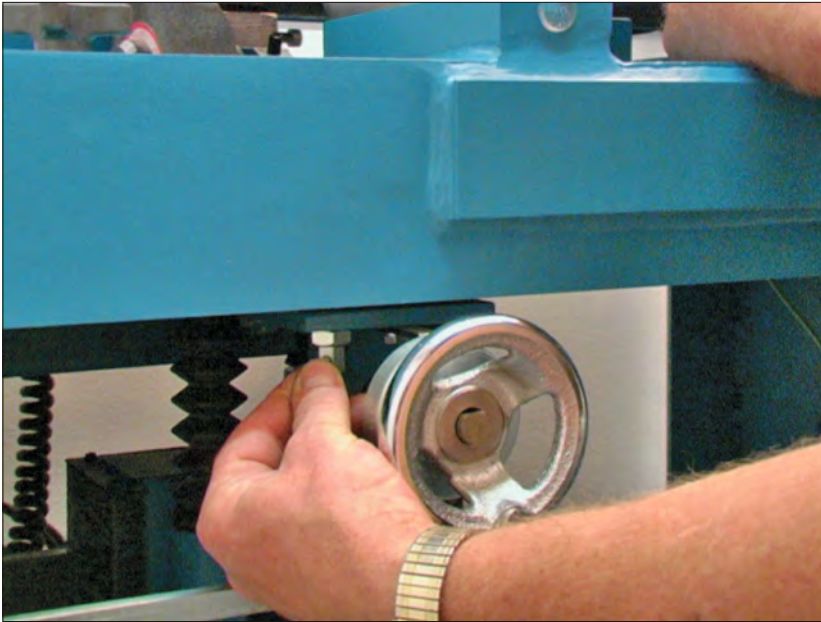


4.2 Spin grinding



Make sure that all clamps are tight. Loose clamping may cause damage or injury.

Feed the grinding head up until the grinding wheel just touches the reel at the large end then back off about .020.

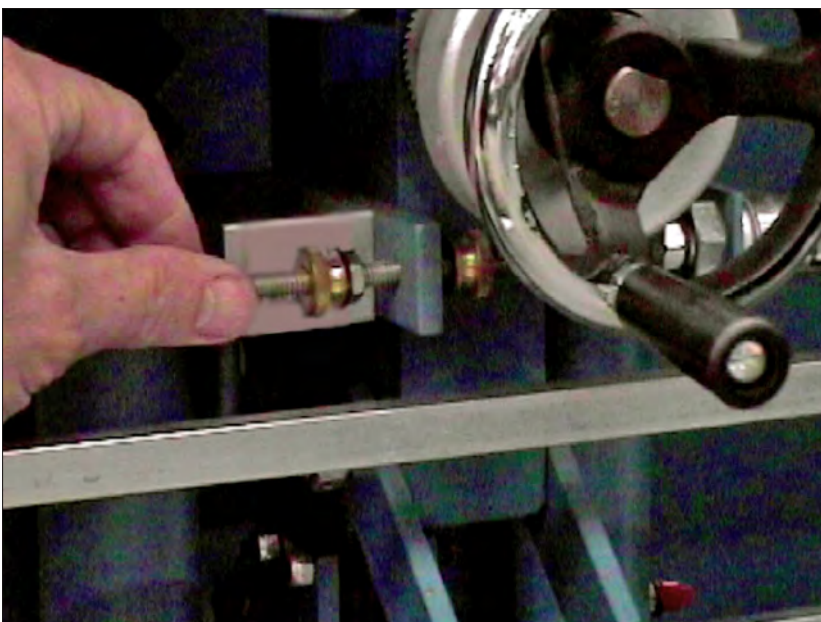


Engage the grinding head to the pneumatic drive.

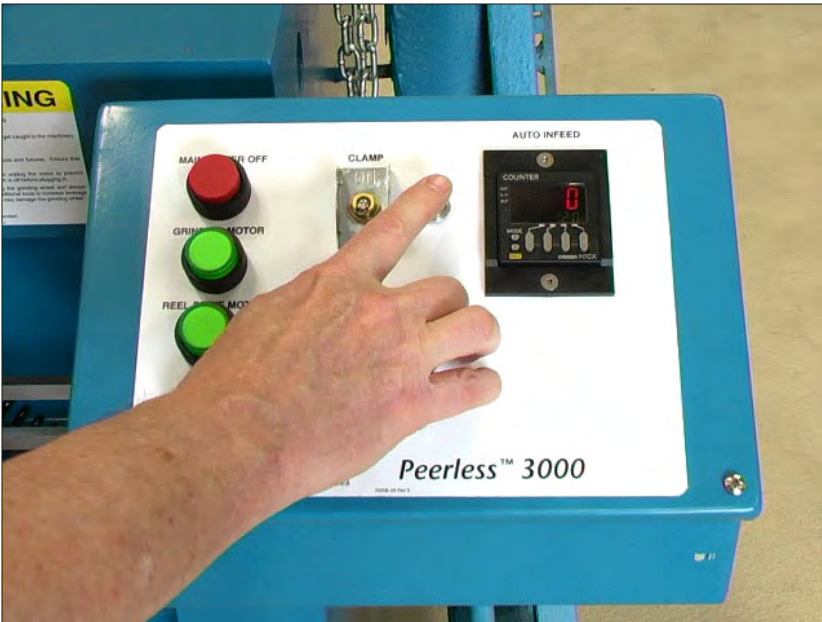


Gasoline vapors are highly flammable.

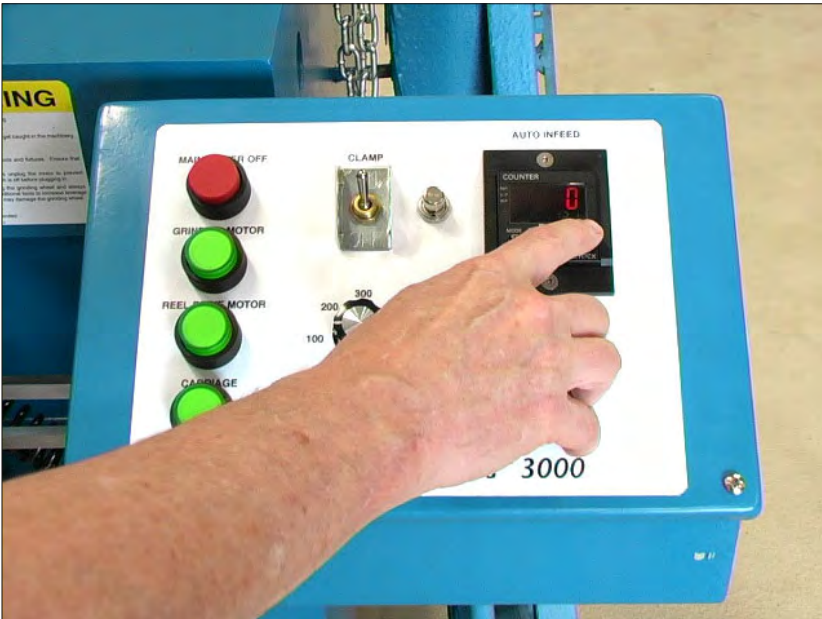
Turn the vapor detector on if you have a 4000 and are grinding a mower with a fuel tank.



Check the depth stop for the amount of infeed per pass.



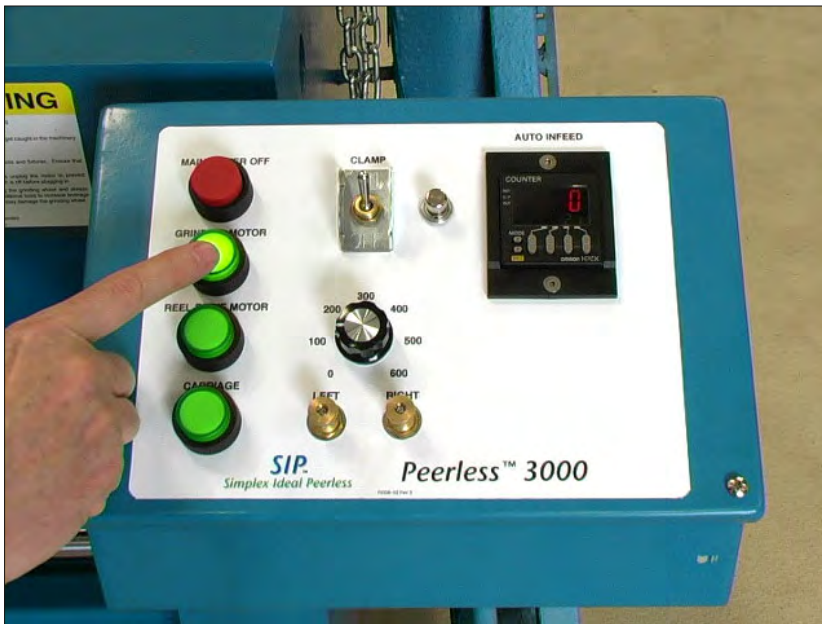
Turn on the counter.



Set the number of passes.

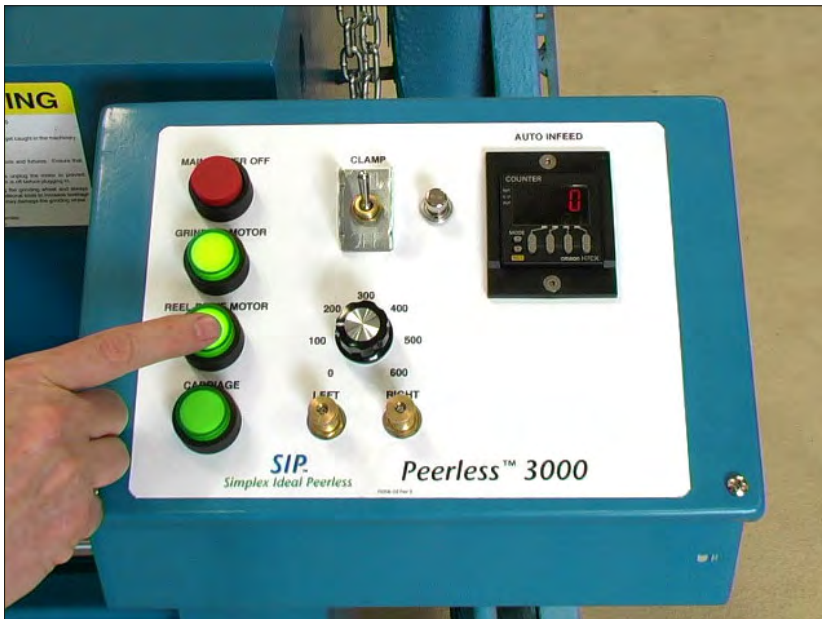


Push the Reset button.



Always close shield or wear safety glasses and face shield when grinding! Stay clear of grinding wheel when turning grinder on!

Close the door on the grinder. . Turn the grinding motor on.



Make sure the reel is properly aligned with the spin motor and that the reel spins freely. Start the spin motor.



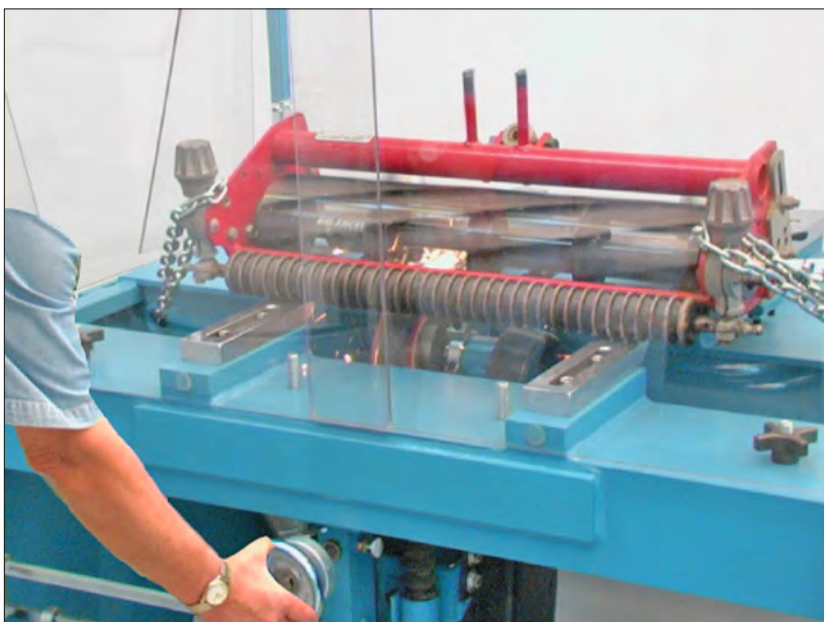
Set the spin speed, faster for small reels, slower for larger reels. 200-300 rpm is usually the slowest you will need to use.



Turn the carriage travel on. There may be a slight pause before the carriage begins to move.



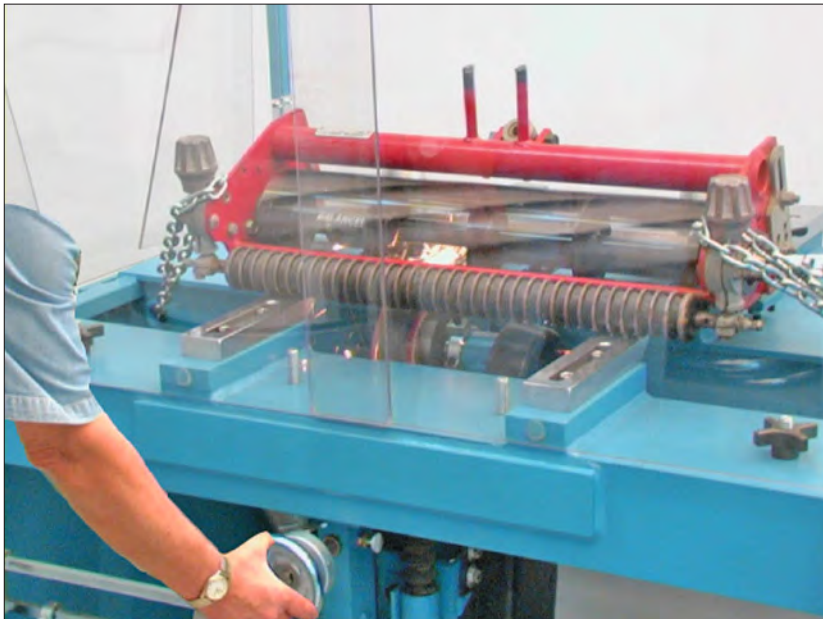
Set the carriage speed so it is about equal in both directions.



Slowly feed the grinding head in until the grinding wheel starts to grind the reel then allow the grinding head to travel back and forth.



Snug the tension screw. Depending on the size, type, and condition of the reel, you may wish to adjust the speed of the spin motor or the carriage travel so that you get a smooth, consistent grind.

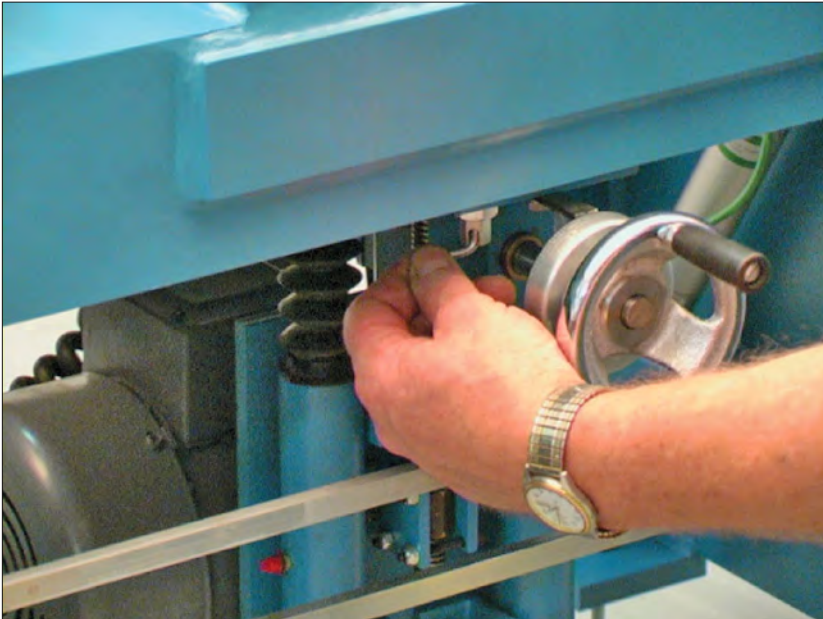


The auto infeed will continue to feed the grinding wheel. Listen for uniform grinding sound all the way across the reel. When the counter has reached the total count you selected it will stop infeeding and spark out. If the reel is not sharp you may reset the counter for additional passes. You also have full manual control of the grinding wheel infeed, even in full auto mode.

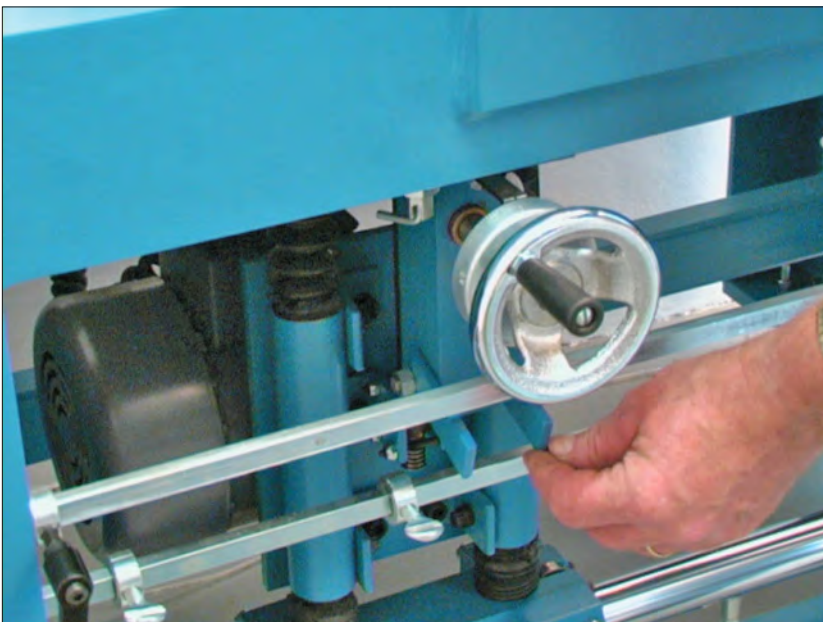


At the end of the last pass, turn the grinder off.

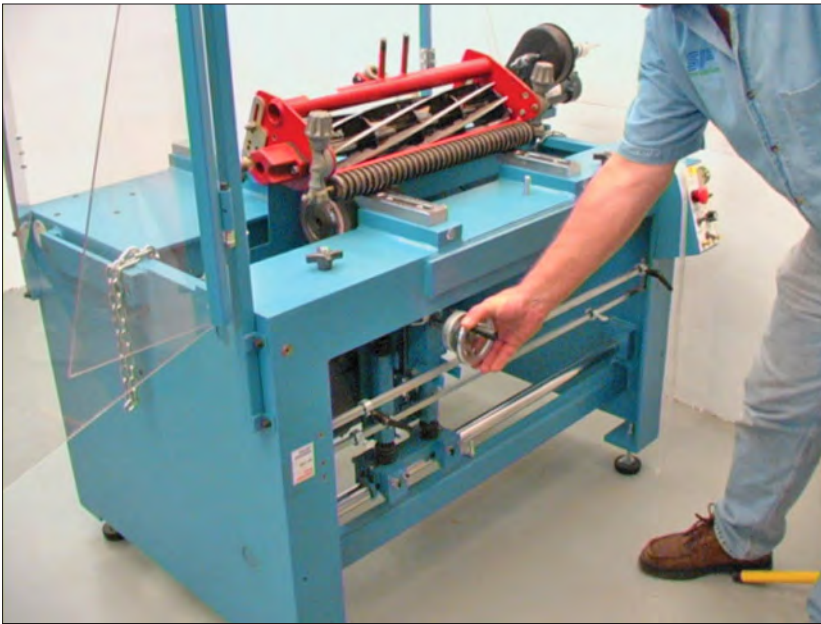
5. Relief Grinding



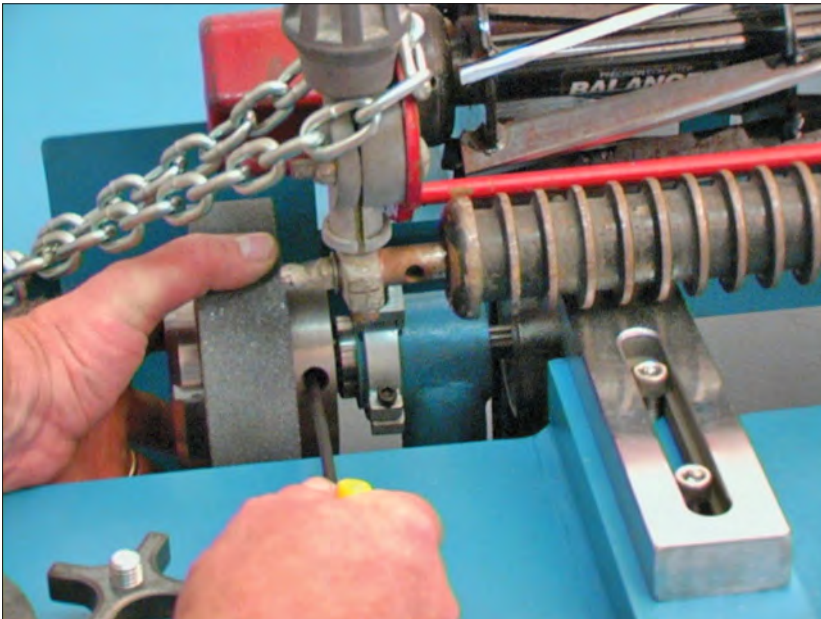
5.0 Changing the grinding wheel
Disengage the grinding head.



Move the stop levers to their center position.

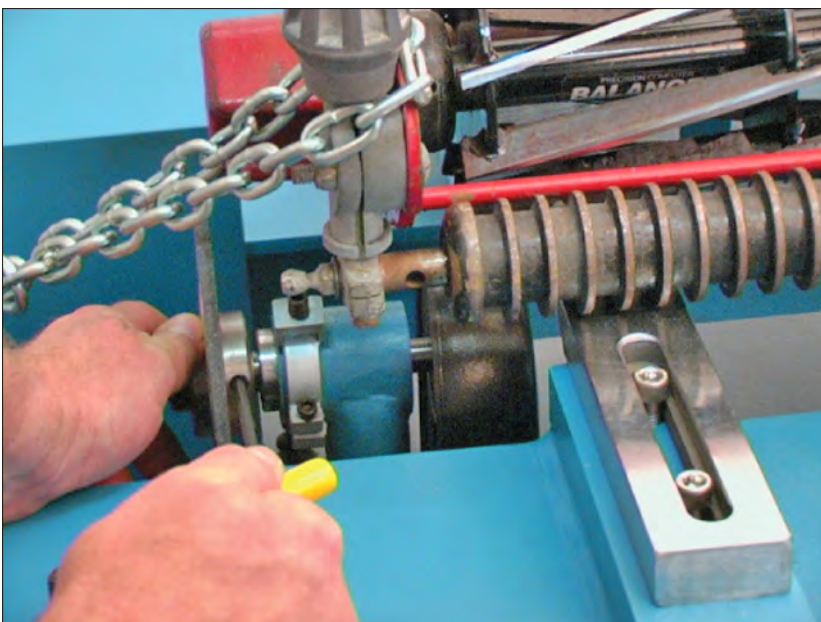


Move the grinding head to the left end of the grinder.

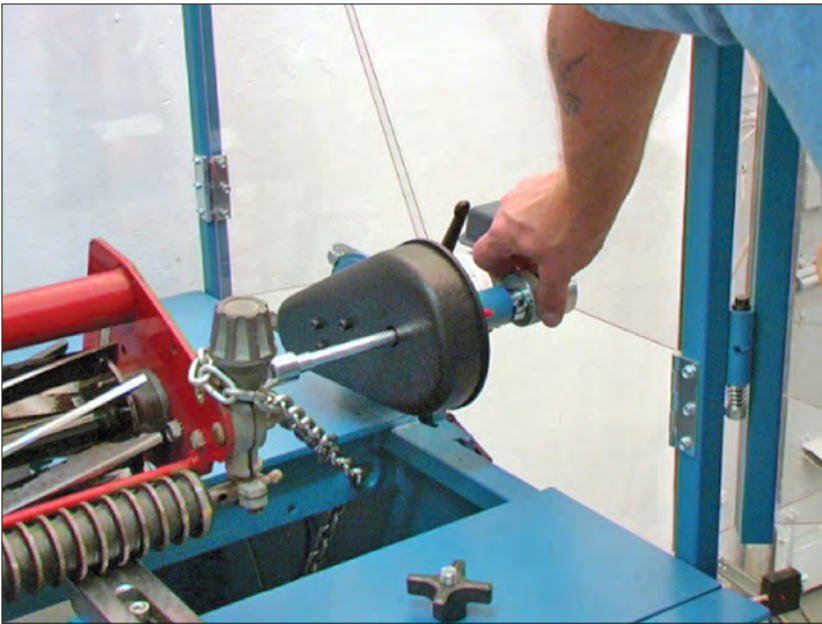


Do not use a damaged stone as it may explode and cause injury or death.

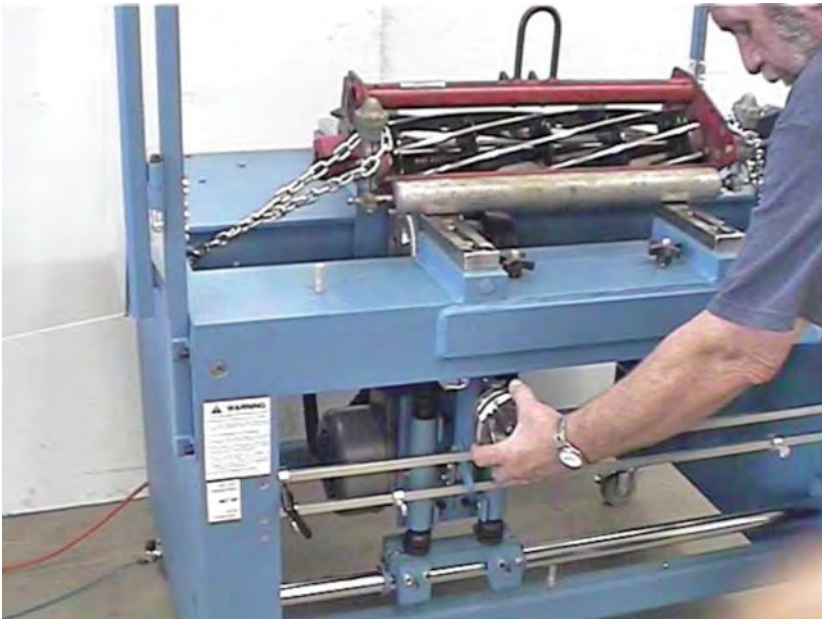
Use the T-handle allen wrench to loosen the set screw which locks the quick change hub to the shaft. Gently slide the spin grinding wheel off the shaft taking care not to damage it.



Gently slide the relief grinding wheel on to the shaft until it seats against the snap ring taking care not to damage it. Using the T-handle allen wrench, tighten the set screw which locks the quick change hub to the shaft.



Unlock the slip clutch.



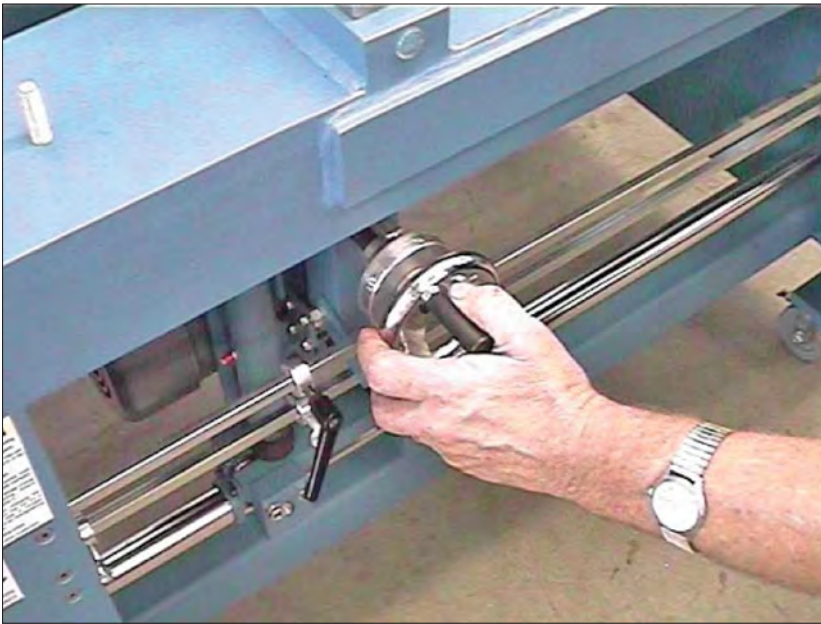
5.1 Setting the relief angle

You must set the relief angle so that the grinding wheel does not contact the blade in front of the one being ground. Find the closest blade gap by checking for uneven blade spacing or bent blades.

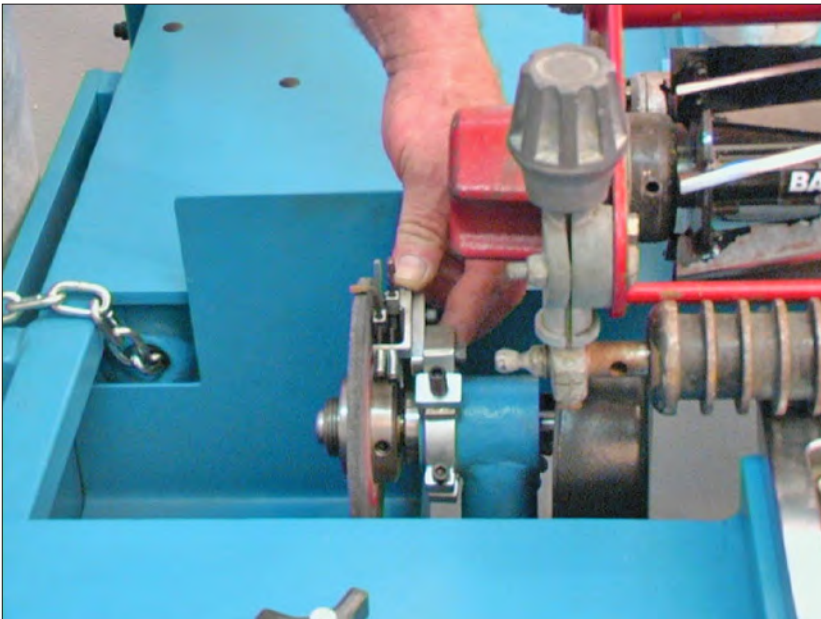
Move the grinding wheel to the left end of mower blade. Feed the grinding head up until it makes contact with one of the reel blades, as it is rotated back and forth past the grinding wheel.



When the blade is just touching the wheel, rotate the reel blade so that the two blades with the closest gap are just touching on either side of the grinding wheel or so the grinding wheel is touching the blade to be ground and the spider.

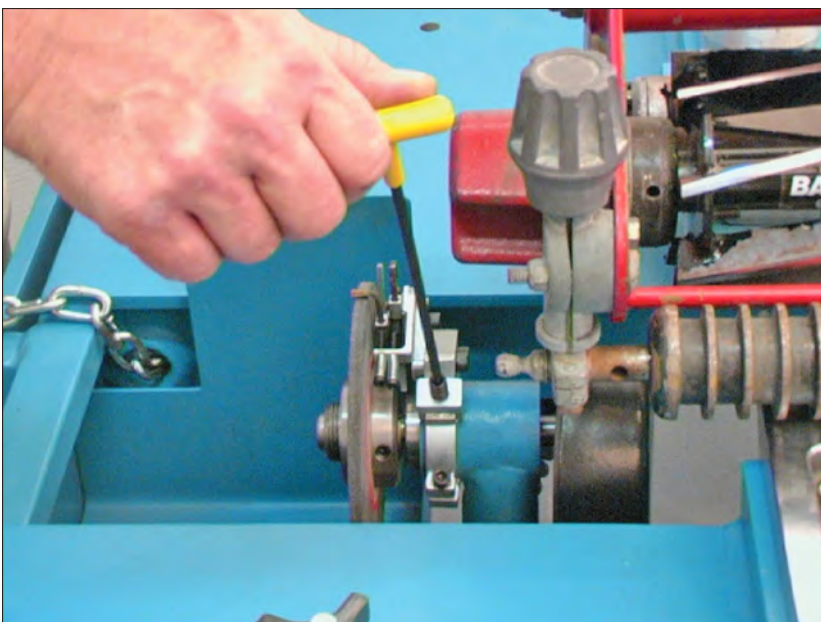


Adjust the grinding wheel down 1-2 revolutions for smaller reels and 4 or more revolutions for larger reels. Make sure that the relief angle does not exceed 45° . This will give approximate the correct relief angle for most reels. You may need to adjust up or down depending on your reels.

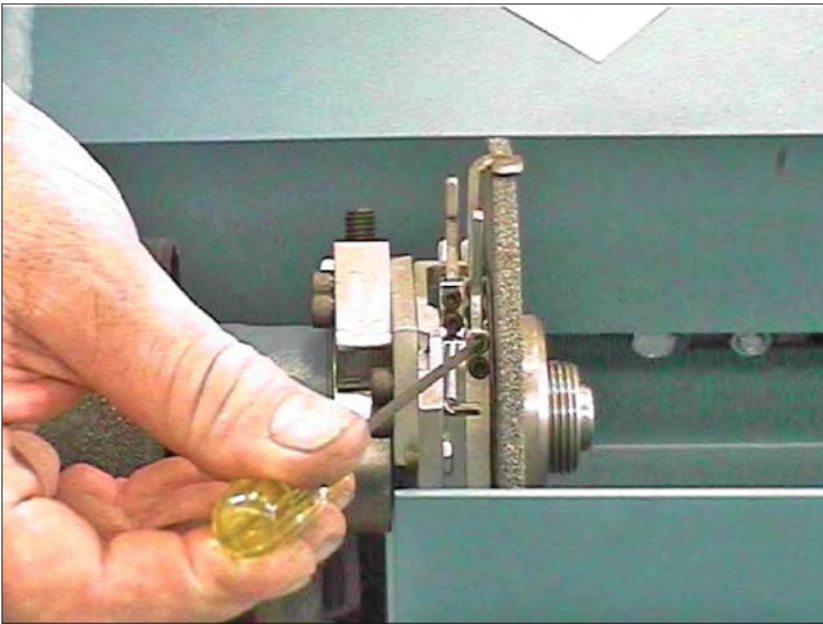


5.2 Mounting the Indexer

Position the indexer assembly behind the grinding wheel. Slide the mounting strip into the clamp ring.

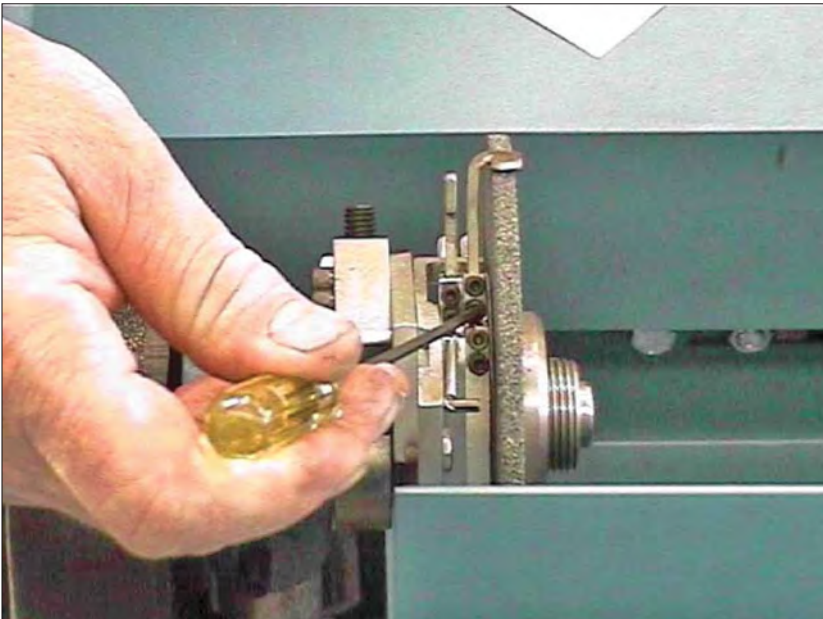


Tighten the clamping screw as shown.



5.3 Stop height fine adjustment

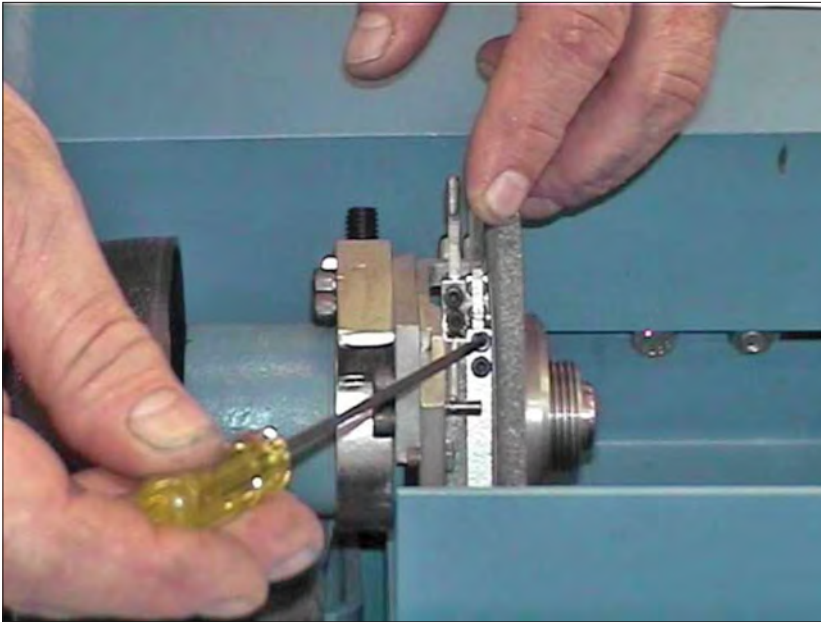
Loosen the two safety catch clamping screws and remove the safety catch.



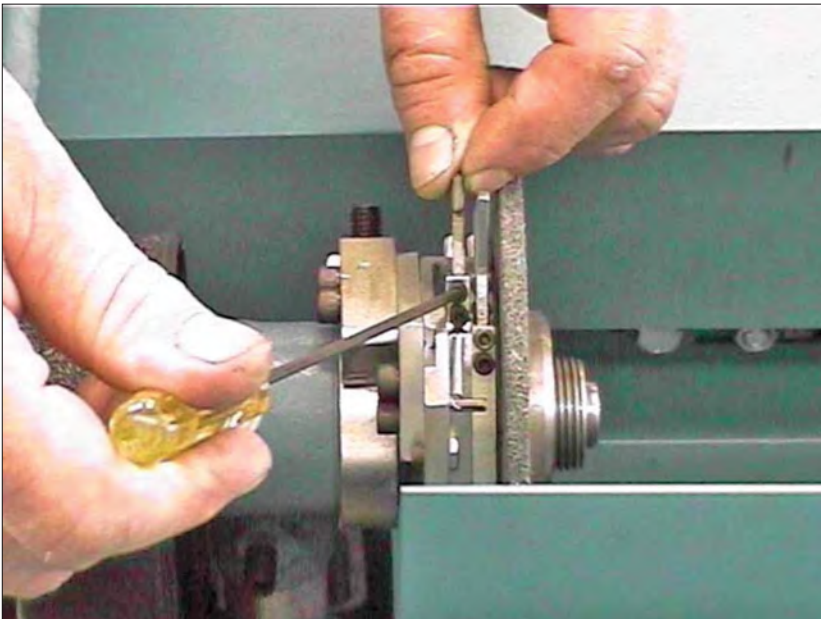
Loosen the two blade stop clamping screws.



Adjust the blade stop up or down until it just clears the grinding wheel. You can use several thicknesses of paper to set the gap. Tighten the two blade stop clamping screws.



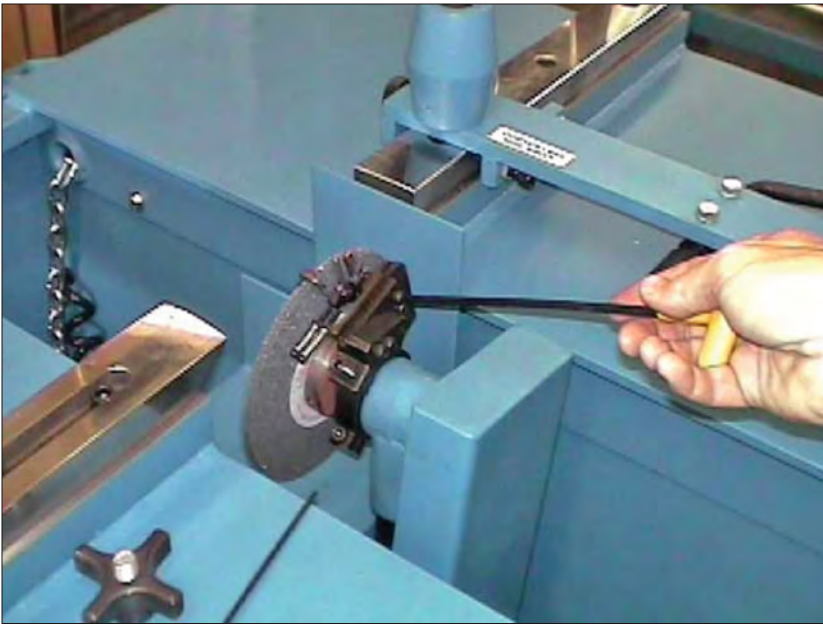
Replace the safety catch and adjust it up or down, then tighten the two safety catch clamping screws. Changing the end of the safety catch that is inserted will change the gap between the indexing stop and the safety catch. You can also rebend the safety catch or make a new one from 1/8 keystone.



Loosen the two indexing stop clamping screws.



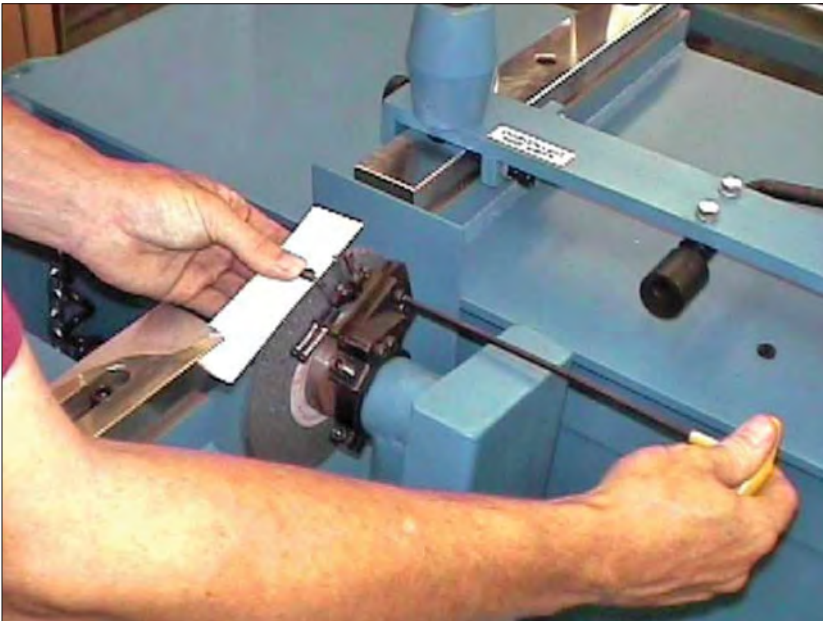
Adjust the indexing stop up or down until it is just below the blade stop. Tighten the two indexing stop clamping screws.



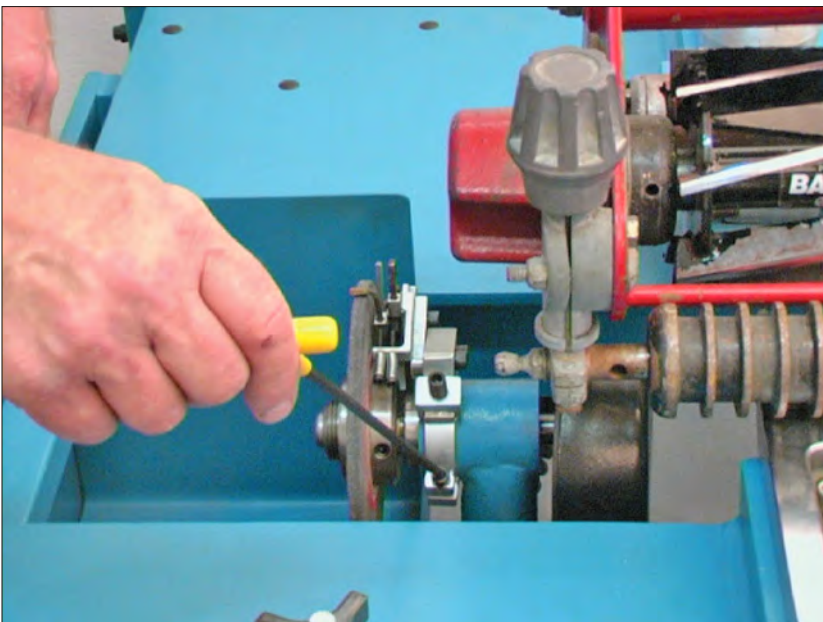
5.4 Stop height coarse adjustment

This adjustment is only necessary to compensate for grinding wheel wear or to accommodate worn reels so that the indexer will not interfere with the spiders.

Loosen the two clamping screws.



Raise or lower the indexer assembly until the stop is just above the top of the grinding wheel. Tighten the two clamping screws.



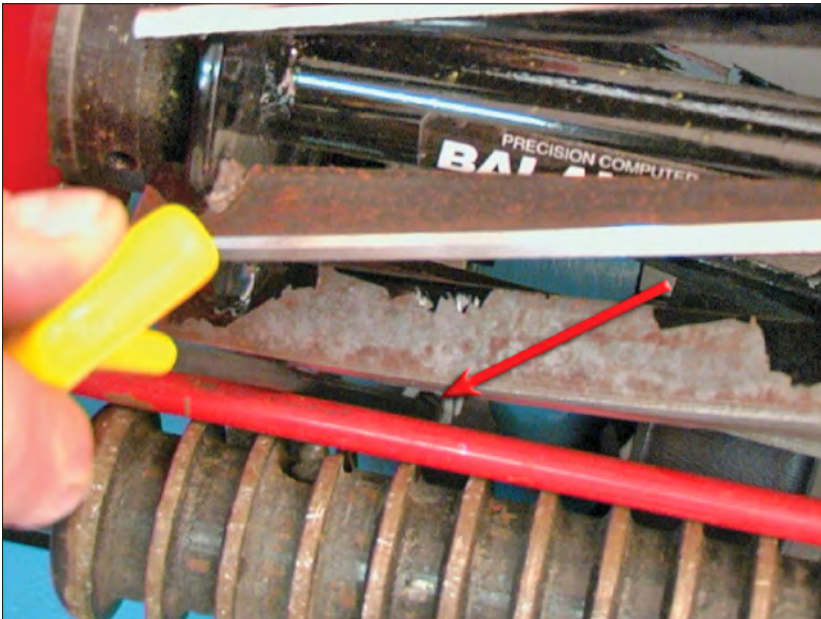
5.5 Engaging the indexer

This procedure is usually only required when setting up the first reel of a particular model or size.

With the grinding head off the left end of the reel, loosen the clamping screw.



Move the grinding head to the right on to the reel until the reel blade is touching the grinding wheel. Rotate the indexer assembly back until the blade stop and the grinding wheel are both touching the reel blade to be ground.



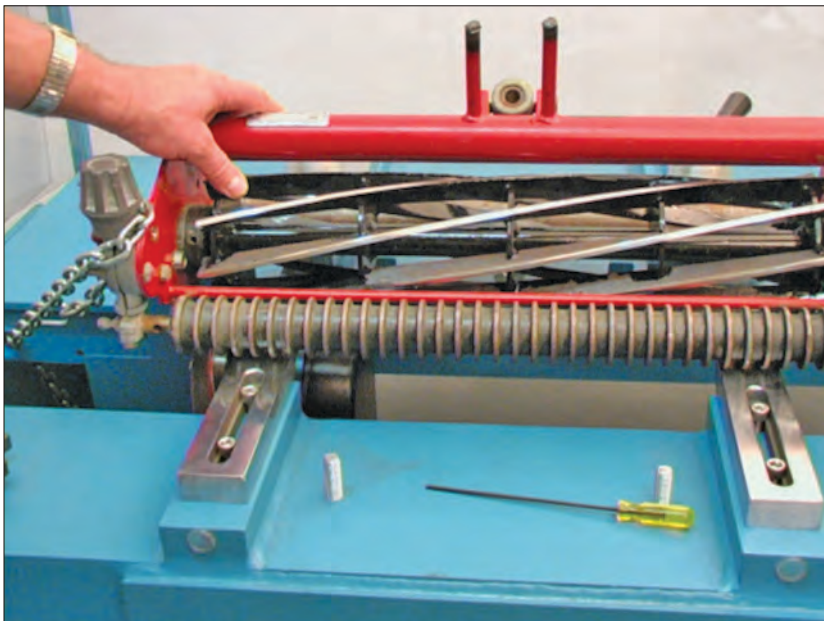
Retighten the clamping screw.



Back the grinding wheel of slightly so that the reel blade rests only on the stops and not the grinding wheel.



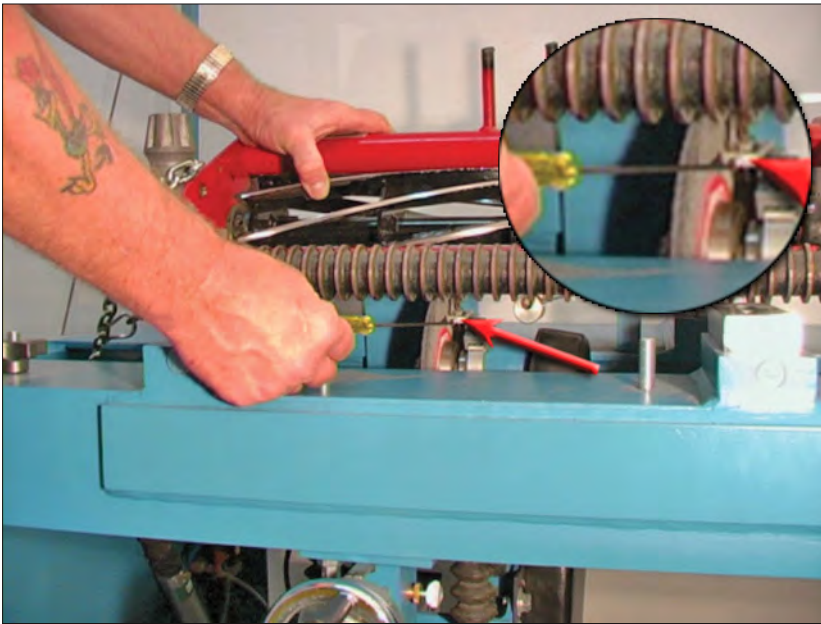
Move the grinding head to the left end of the reel so that the right blade stop is just off the end of the reel but the indexer stop is not.



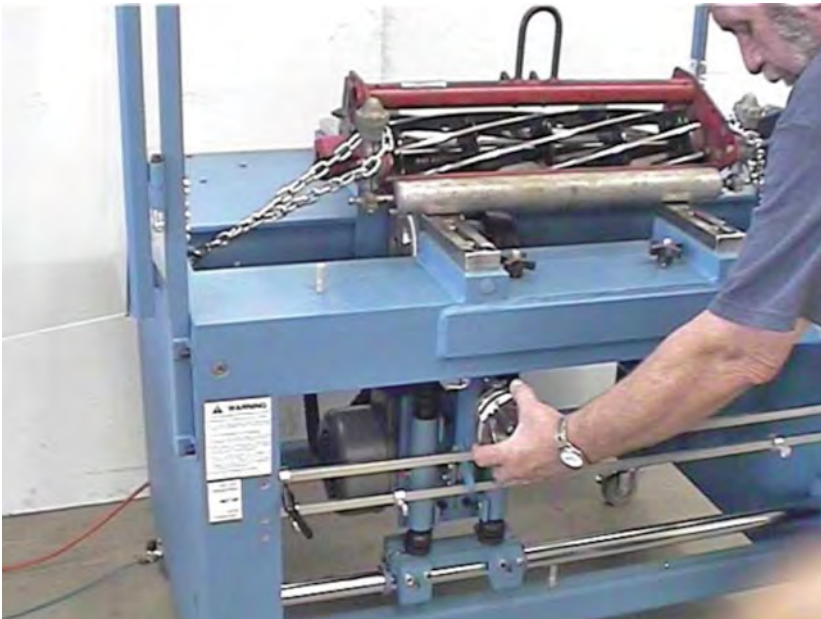
Rotate the reel blade so that it catches the indexer stop.



Move the grinding head to the right so that both the blade stop and the indexing stop are against the reel blade.

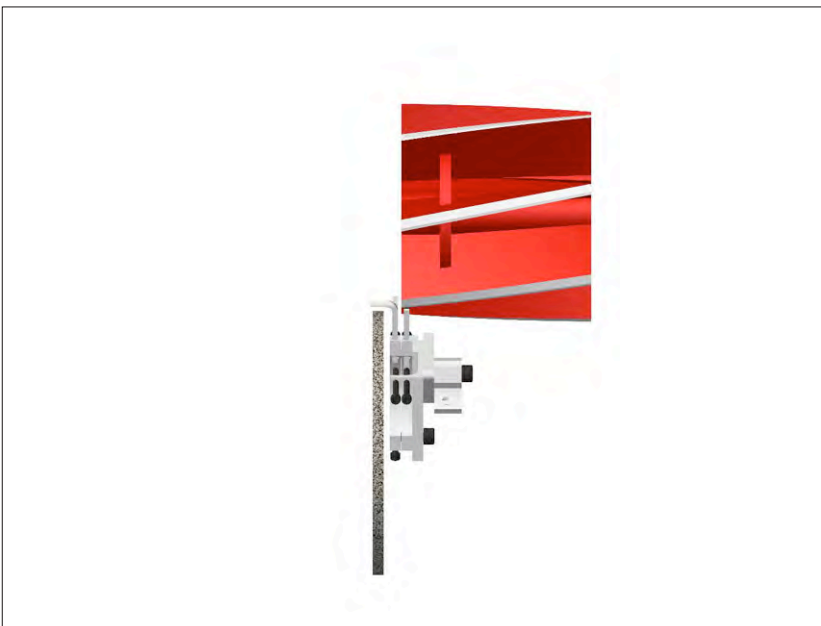


Adjust the indexer stop in or out in short, quick turns until it just touches the blade. You can tell this by feeling the reel move with your thumb. If you do not use short, quick turns, you will not feel the blade move.

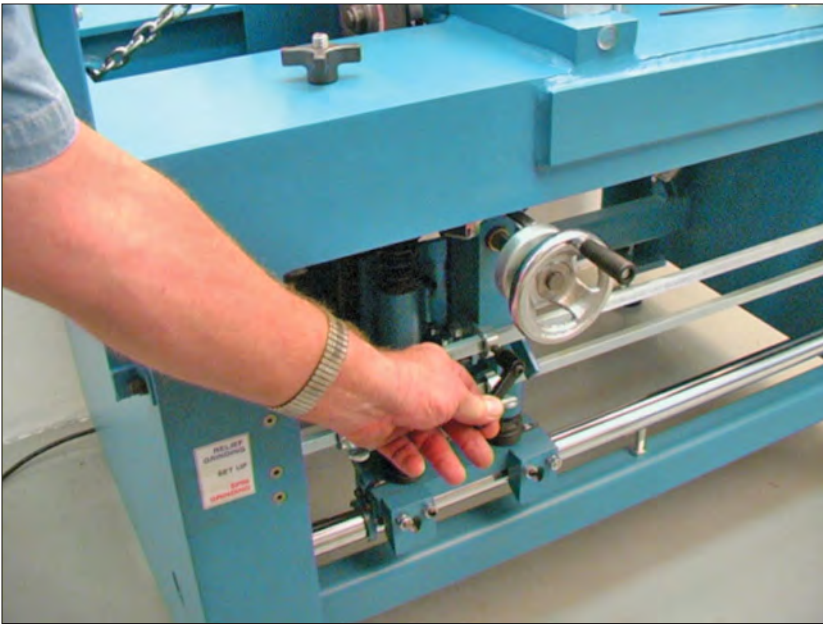


5.6 Setting travel stops

Move the grinding head to the left end of the reel...



so that the right blade stop is off the end of the reel while the indexer stop is still on the reel blade.



With the left lever in the up position, set the left carriage travel stop.



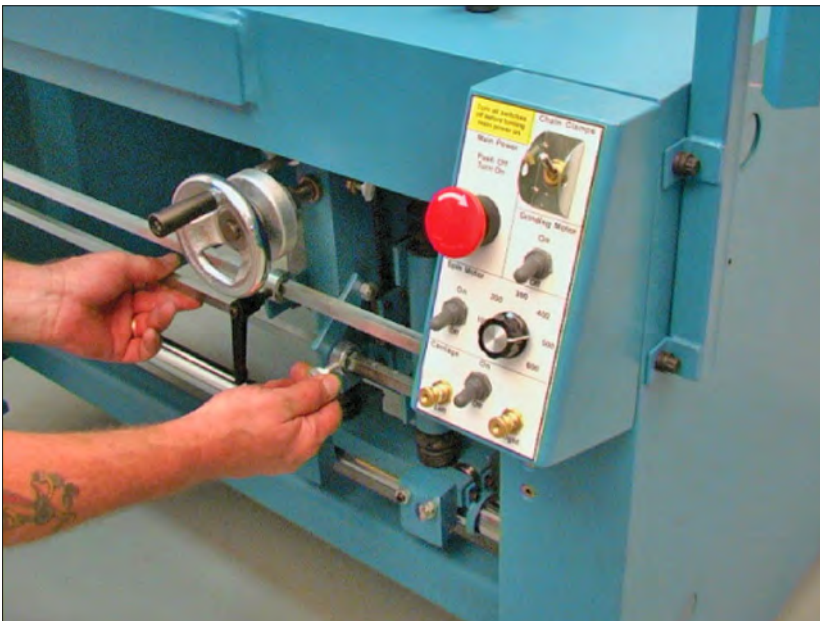
Move the grinding head to the right end of the reel...



so that the grinding wheel is off the end of the reel while the left blade stop is still on the reel blade.



Set the top travel stop against the top lever.

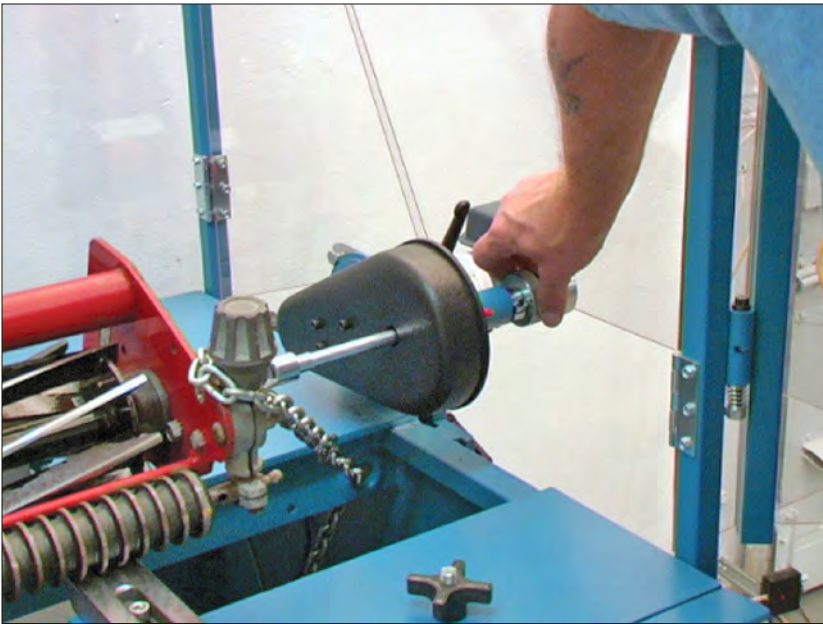


While holding the bottom travel stop bar to the right, set the bottom travel stop against the bottom lever.



5.7 Checking the indexer

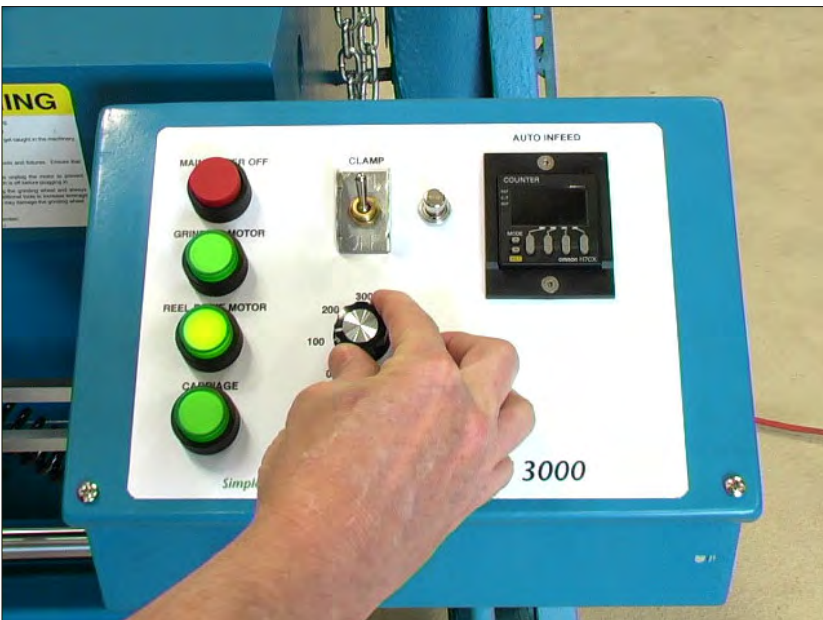
Rock the reel back and forth between the indexer and safety catches to ensure that the blade being ground touches the safety catches before the blade in front touches the grinding wheel.

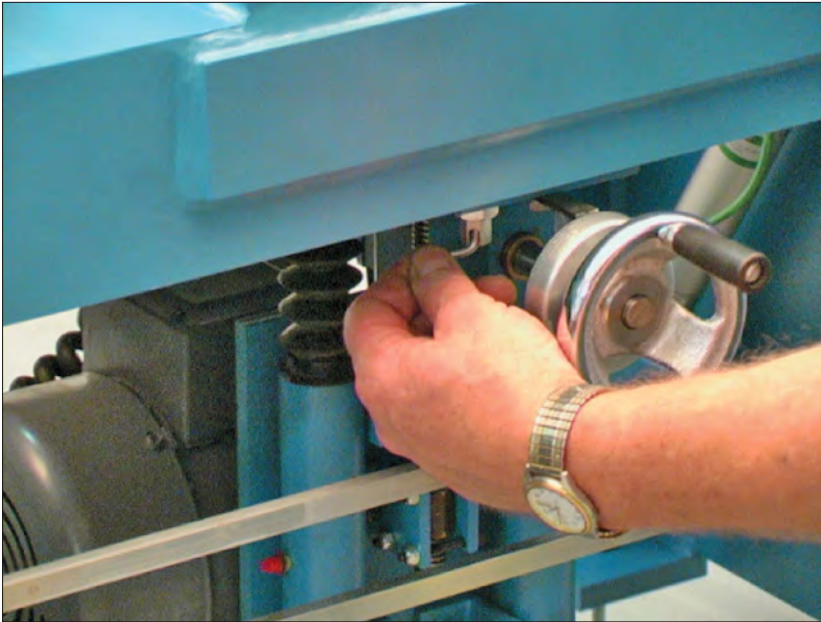


Check that the slip clutch is unlocked for relief.

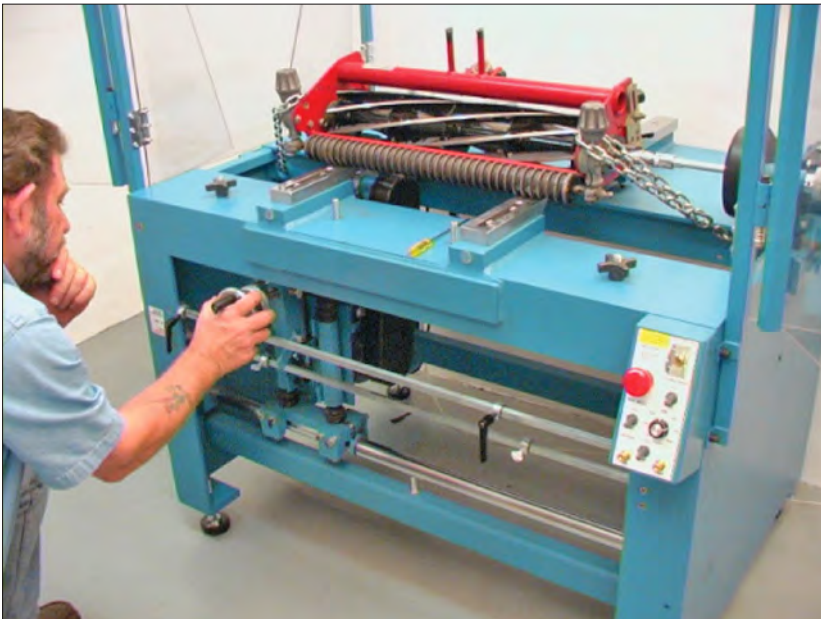


Turn the reel drive speed to zero, turn the reel drive motor on then slowly increase the speed until the reel drive motor is turning as slowly as possible. This should cause the reel blade to remain against the reel blade stops as the grinding head moves in either direction.





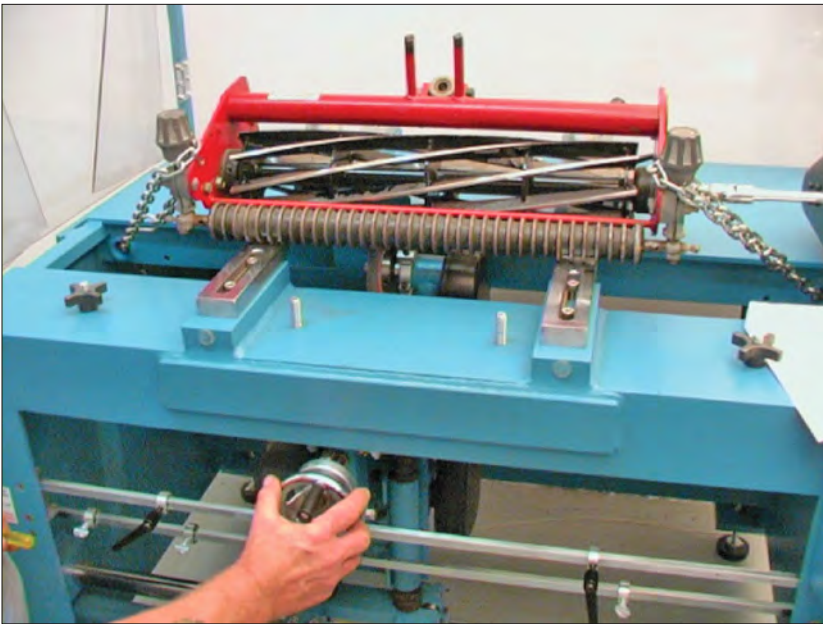
Disengage the carriage travel.



Move the grinding head back and forth across the reel and check for correct function of the blade stop and indexer.

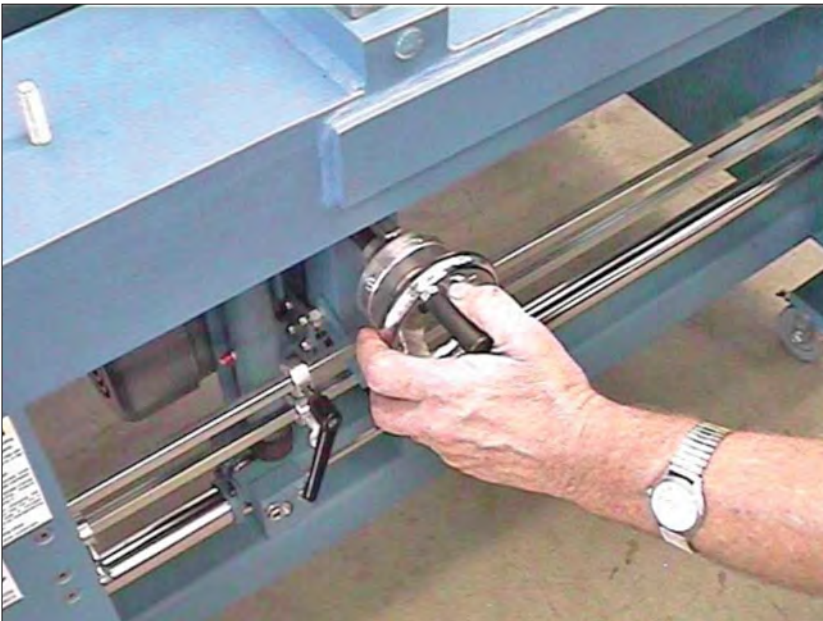


Turn the reel drive motor off.

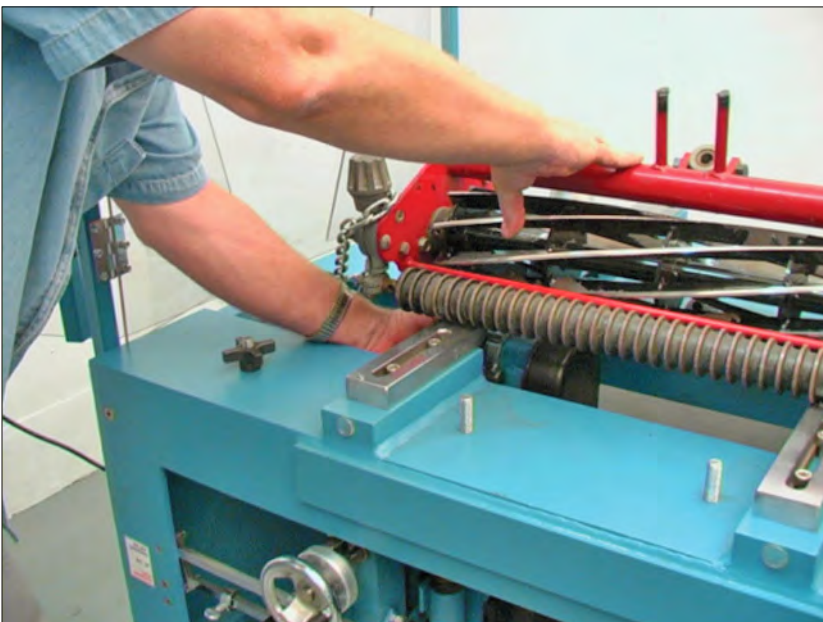


5.8 Adjusting for variations in the amount of relief

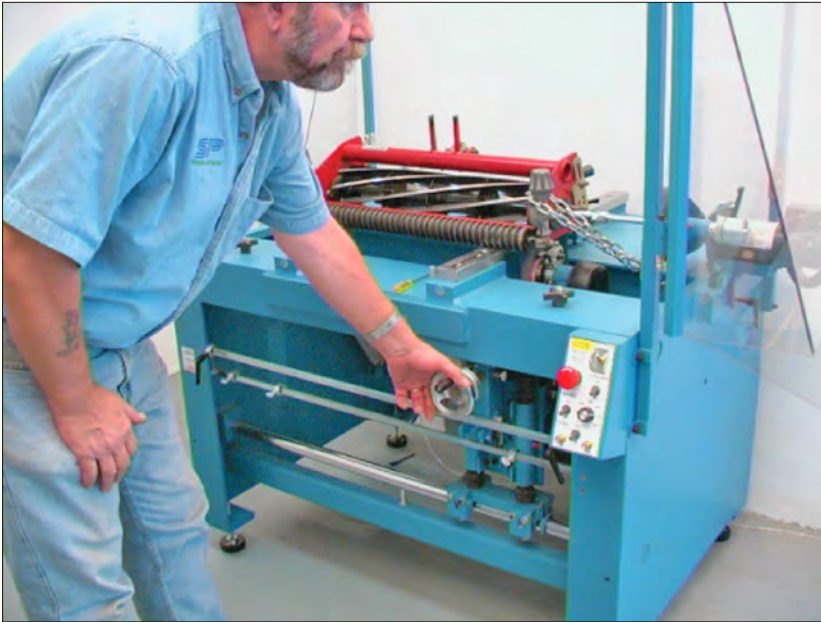
Move the grinding head to the left end of the reel.



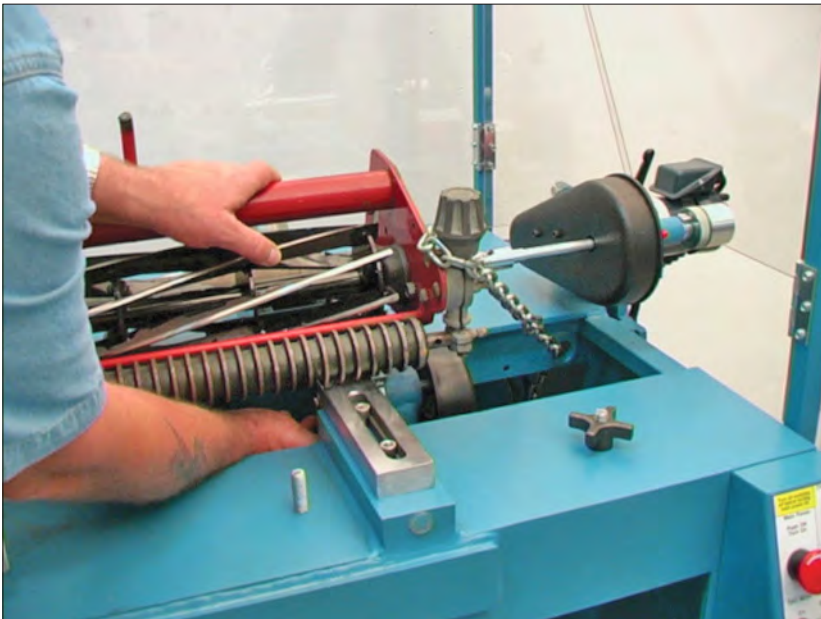
Feed the grinding wheel up until it just touches the reel.



Check that it just touches by holding the reel blade against the blade stop and turning the grinding wheel



Move the grinding head to the right end of the reel.



Again hold the reel blade against the blade stop and turn the grinding wheel to see if you have the same contact as on the left end of the reel. If you get the same contact while infeeding the grinding wheel up or down .010, go to Section 5.9, otherwise continue on to the next step.



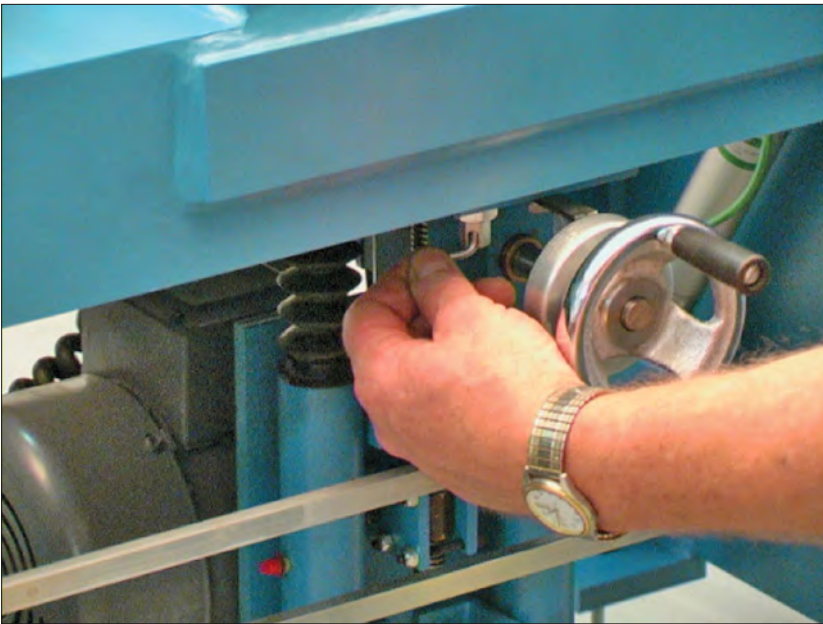
Loosen the bolt on the top of the right fence post. Rotate the post back and forth until you achieve the same contact as you had on the left end of the reel. Lock the bolt on top of the fence post. Check again to see if you have consistent contact and repeat these steps as necessary. This procedure may not be accurate if the reel blades have some relief left.

5.9 Relief grinding



Always close shield or wear safety glasses and face shield when grinding! Stay clear of grinding wheel when turning grinder on!

Engage the grinding head into the carriage travel.

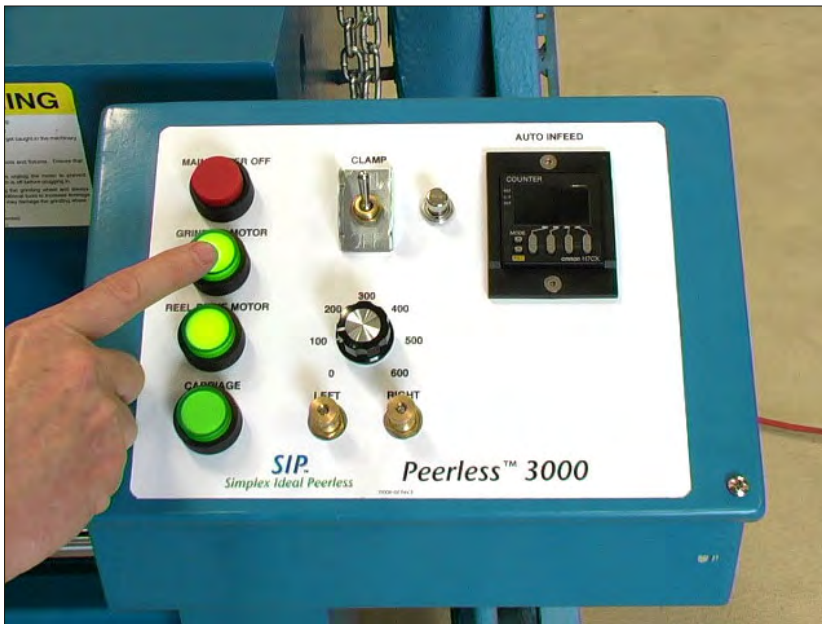


Turn the reel drive motor.



Check the speed.





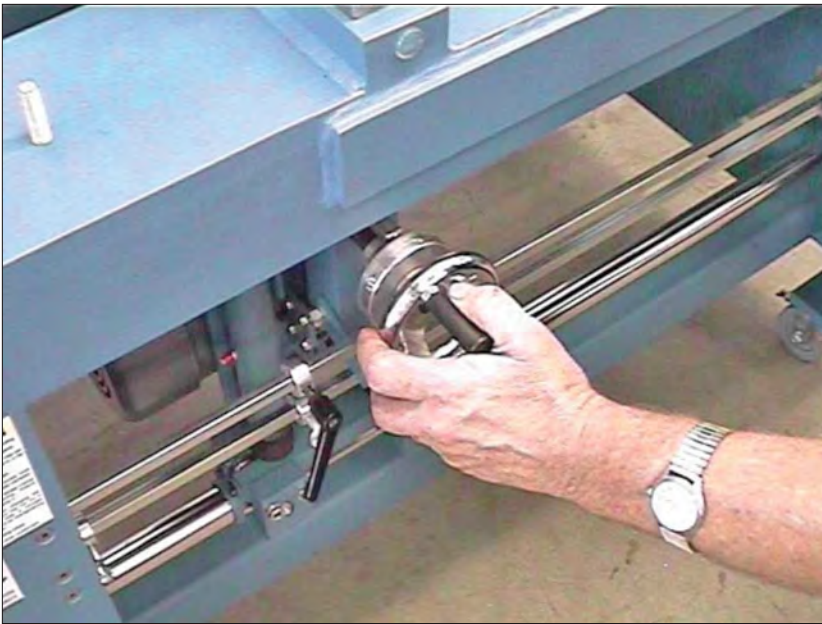
Turn the grinding motor on.



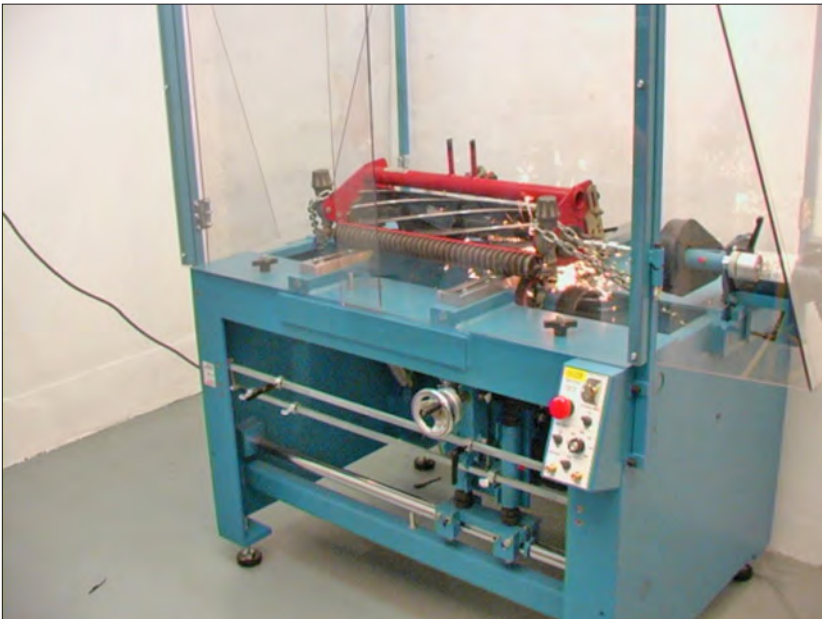
Turn the carriage travel on.



You may need to adjust the speed to get a satisfactory grind. Most of the grinding is done as the grinding wheel feeds into the blade. This will be as the grinding head is moving to the right for right hand spiral blades and to the left for left hand spiral blades.



Feed the grinding wheel up to obtain the desired percent of relief grind. The amount you feed will depend on reel size and condition and grinding wheel size due to wear.

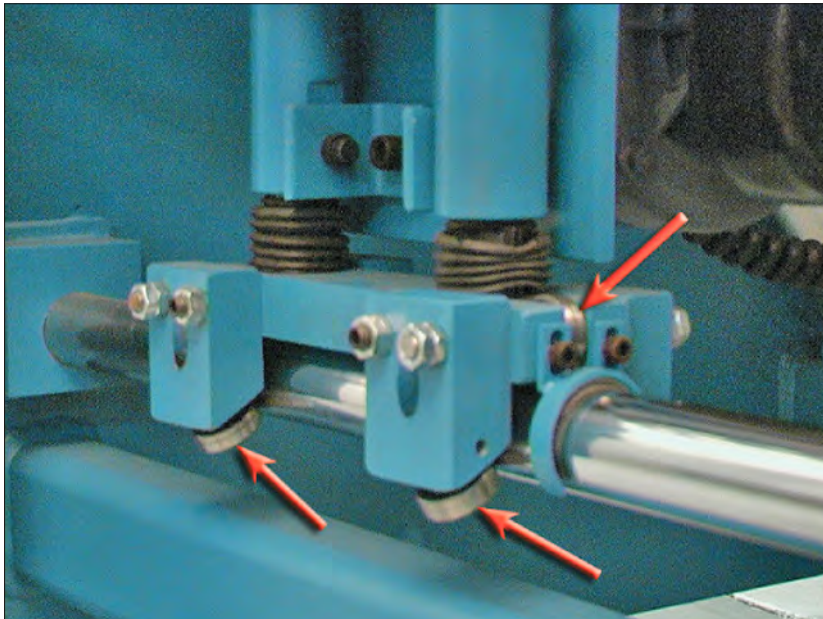


Let the grinder continue to grind the reel blades until you have the desired relief on all of the reel blades. Many reels can be ground with one or two passes. Larger reels with thick or hard blades may take three or more passes. If the reel blades ride on the stops before the desired relief is achieved, you may infeed the grinding wheel slightly to increase the percent of blade ground.



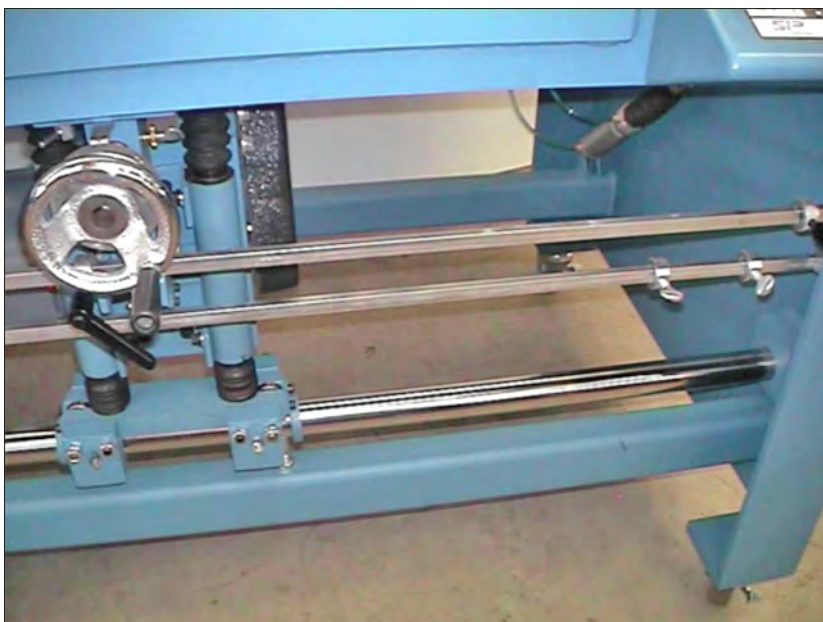
When you have the desired relief ground, turn the carriage travel off, then the reel drive motor off, then the grinding motor off.

6. Maintenance



6.0 General maintenance

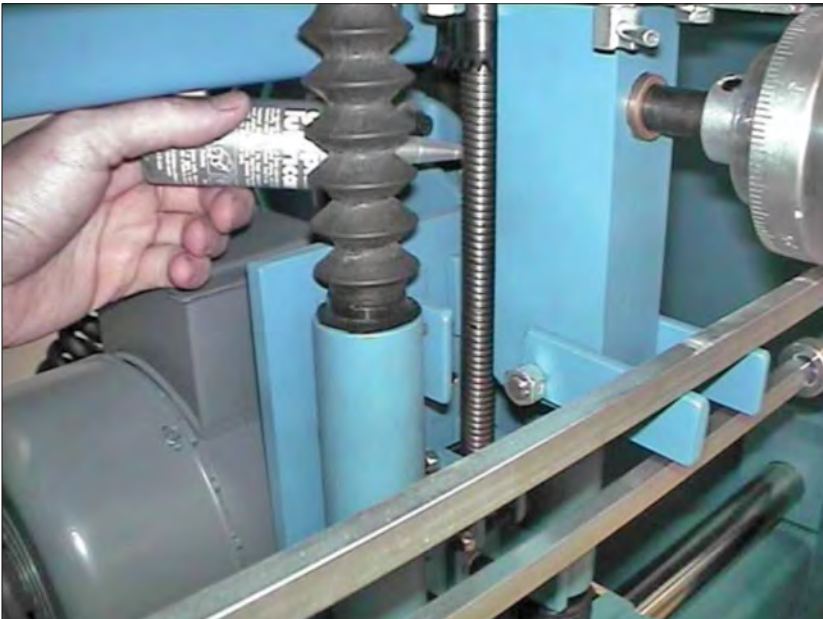
The carriage bearings are permanently sealed and lubricated. They require no lubrication or attention except to be kept clean.



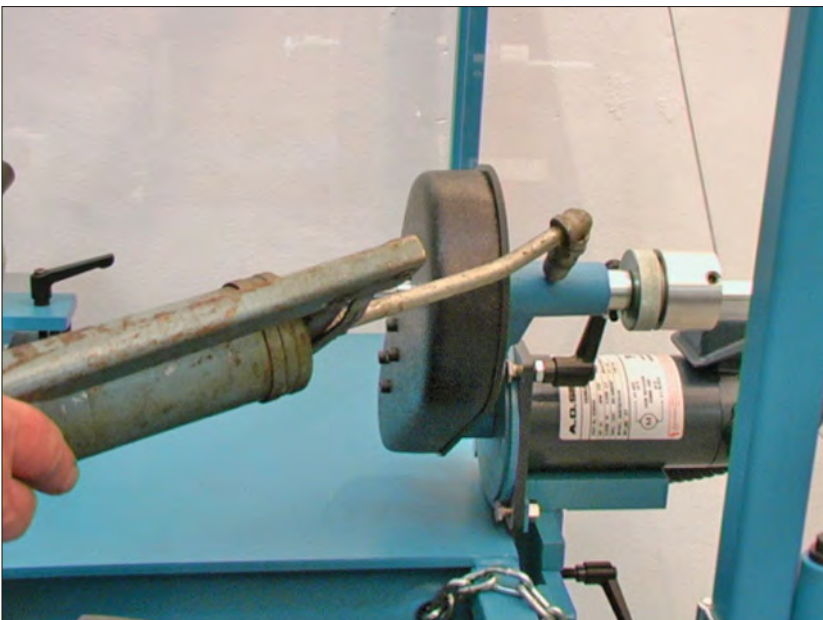
The track shafts must also be kept clean and free from grinding dust and are equipped with integral wipers. Do not oil the track shafts as that will cause the grinding dust to cling to the track shafts and make the wipers ineffective.



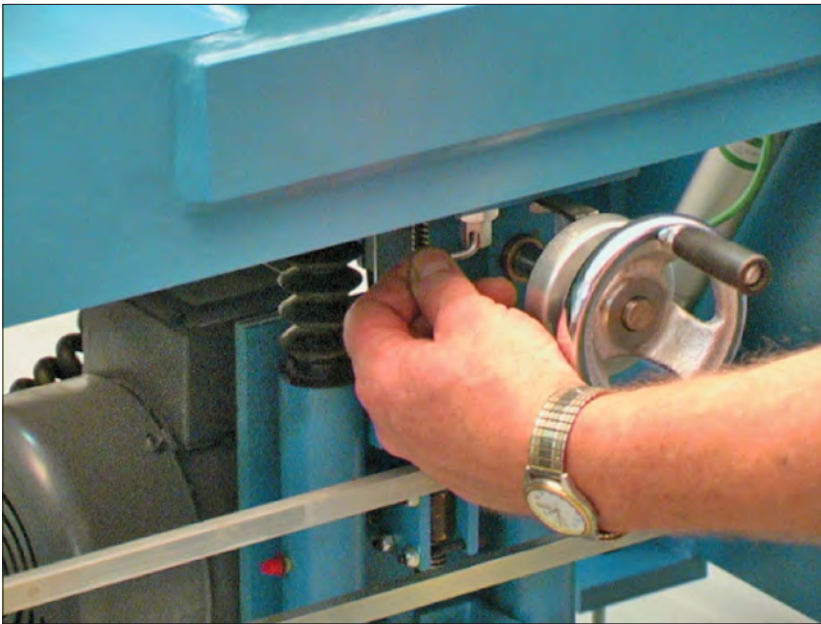
The grinder is equipped with a totally enclosed fan cooled motors which requires no regular maintenance. The motors should be cleaned periodically with either a vacuum or compressed air.



The feed screw should be lubricated lightly with dry graphite as needed for easy operation.



The spin motor shaft has a grease fitting which should be greased at least once a year depending on service.

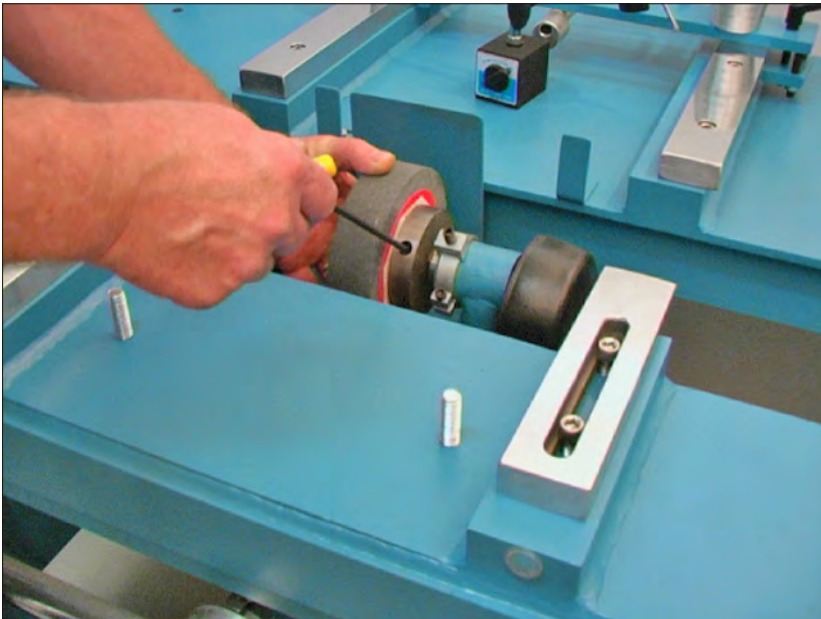


6.1 Aligning the head vertically

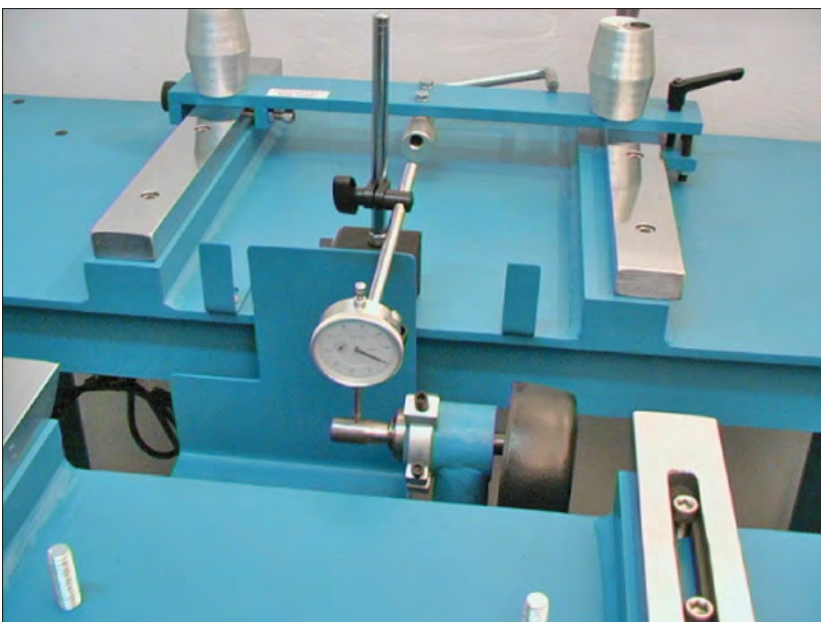


The grinding head is aligned at the factory and should only be adjusted if you are sure it is out of alignment.

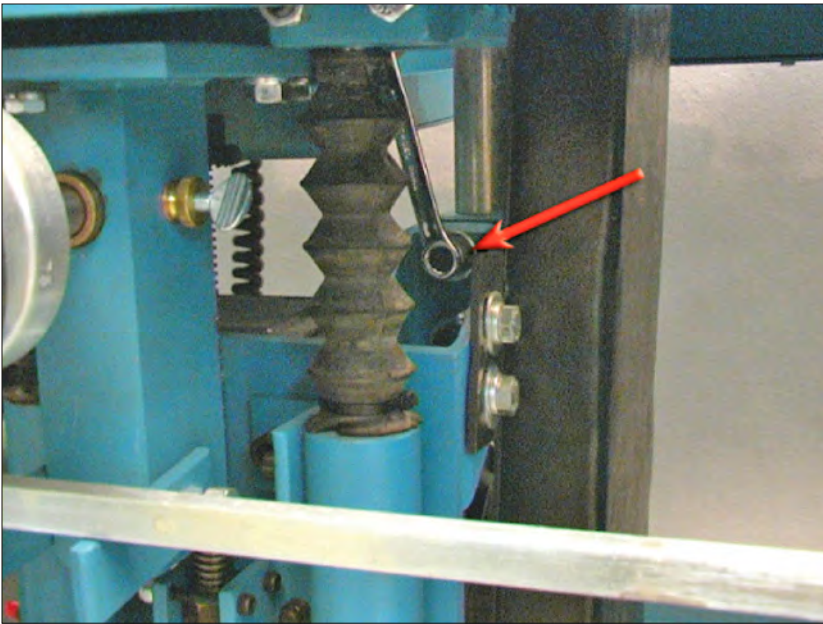
Disengage the grinding head from the carriage travel by pulling the pin down and turning it.



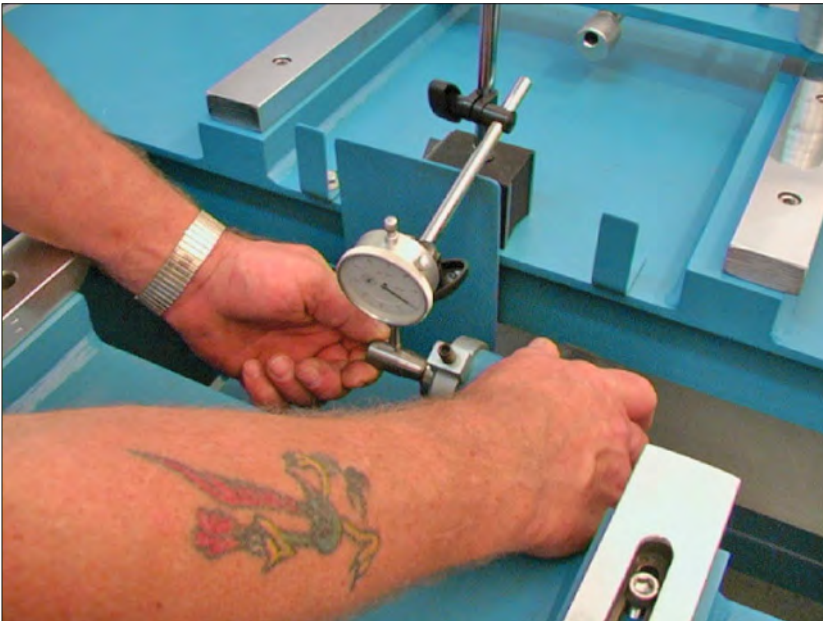
Remove the quick change hub if one is mounted.



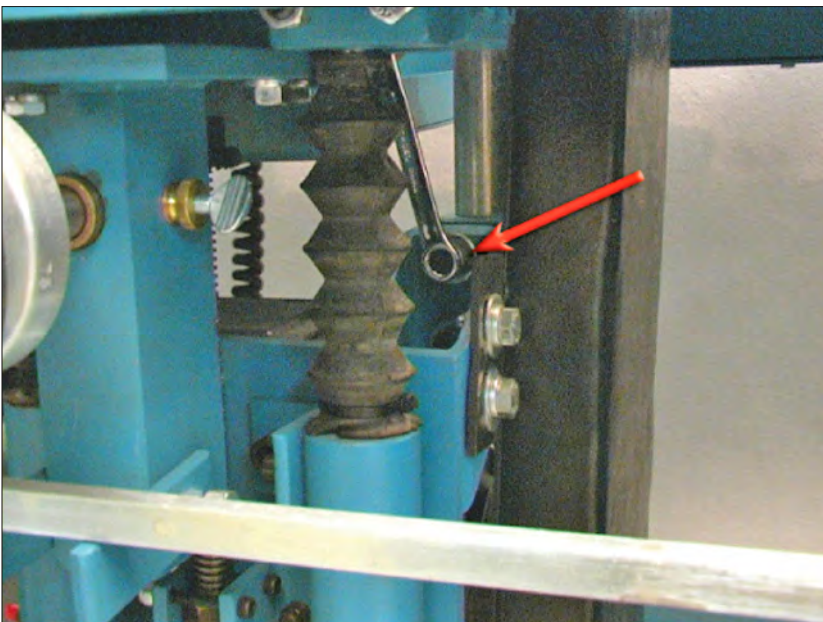
Mount the dial indicator and magnetic base so that the tip of the dial indicator rests on top of the grinding wheel shaft. Move the grinding head back and forth and read the difference on the dial indicator.



If the difference is greater than .002-.003 you should adjust the head by loosening the bolts.



Adjust the head until the shaft varies less than .002-.003.



Tighten the bolts. Recheck the alignment to make sure that you do not move the bearing housing.

6.2 Aligning the head horizontally

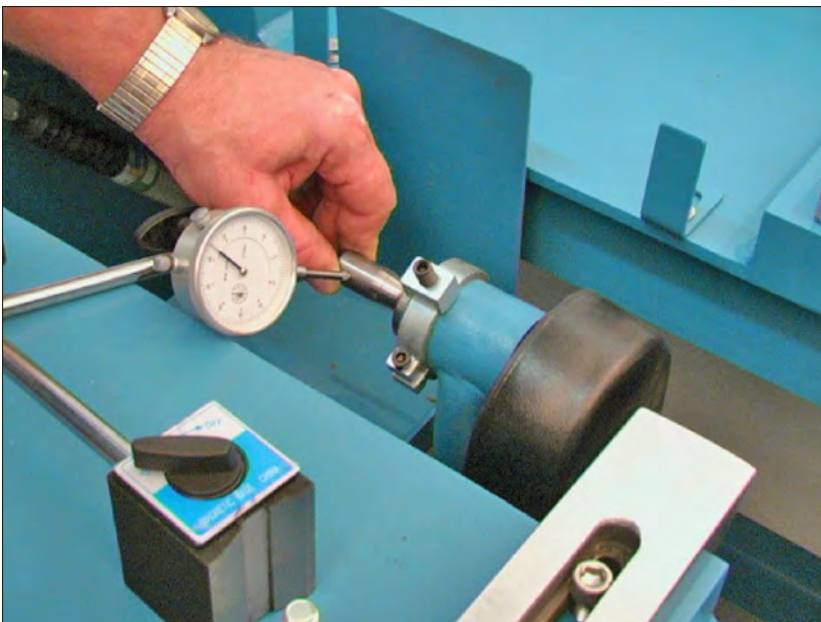
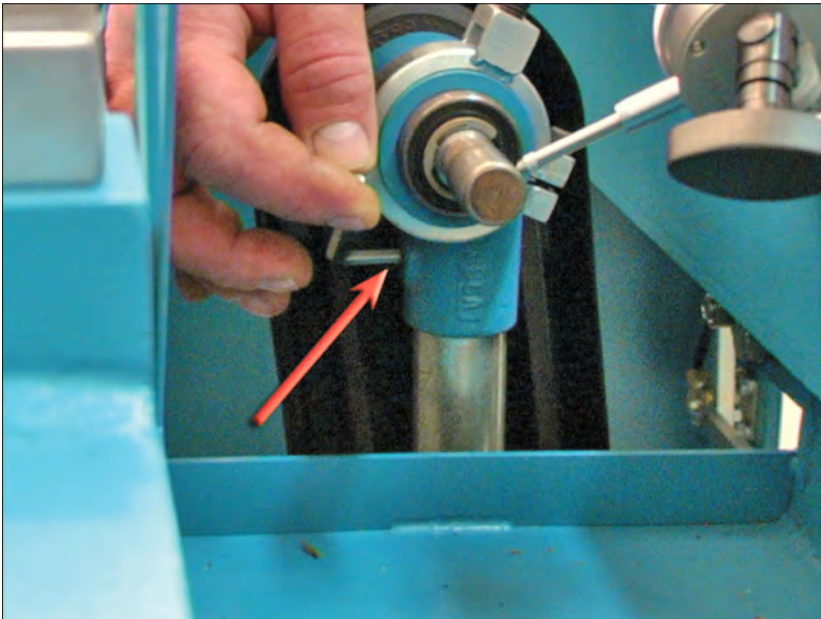
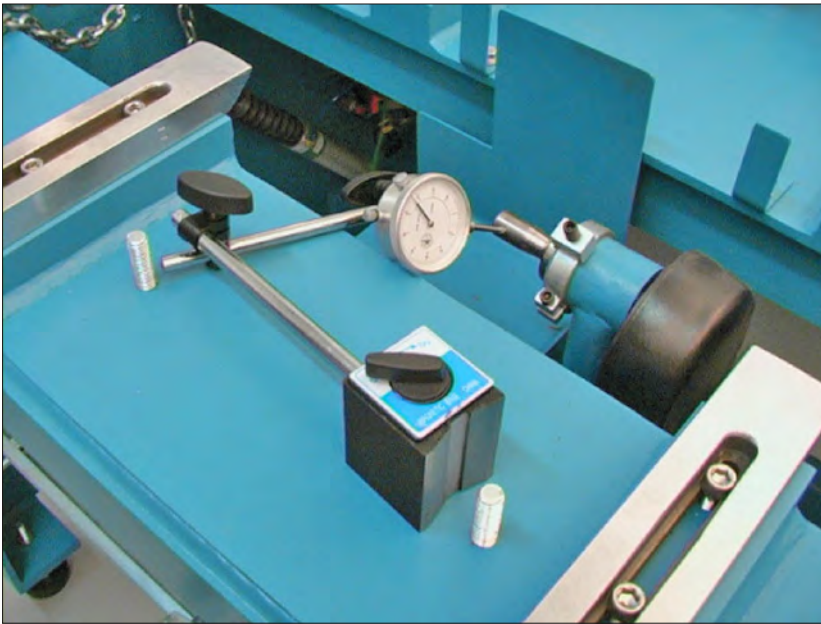


The grinding head is aligned at the factory and should only be adjusted if you are sure it is out of alignment.

With the grinding head disengaged and the grinding wheel removed (see Section 6.1), mount the dial indicator so that the tip touches the front of the shaft. Move the grinding head back and forth and read the difference on the dial indicator.

If the difference is greater than .002-.003 you should adjust the head by loosening the set screws. You may have to loosen the set screw at the bottom of the support shaft and rotate it so that the set screws can lock into a new spot on the support shaft.

Rotate the head until the shaft varies less than 0.003. Retighten the set screws, taking care not to move the head.

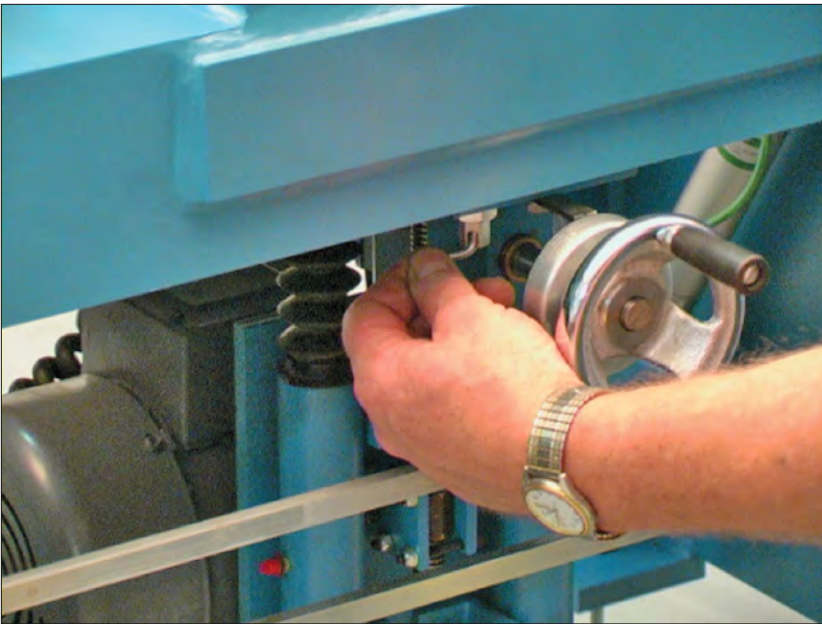


6.3 Dressing the grinding wheel

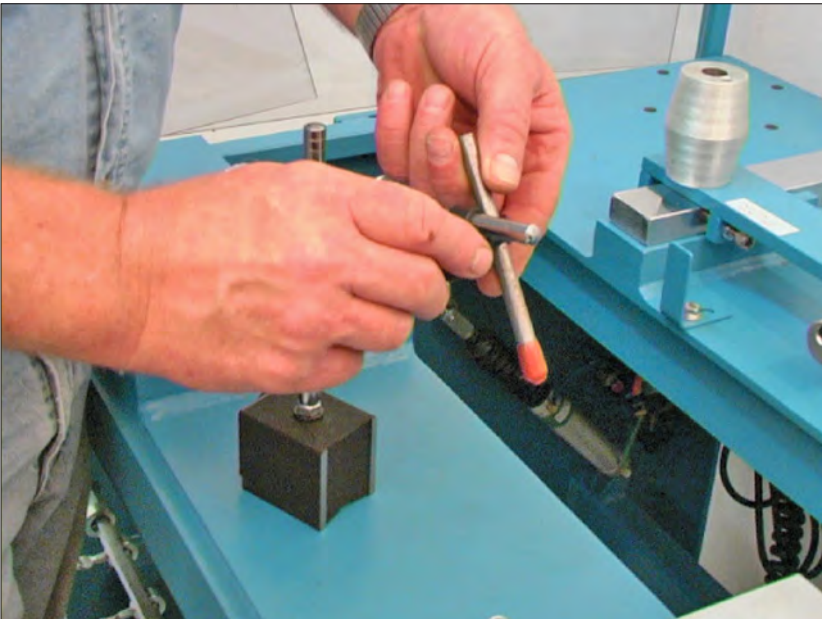


Wear face shield! Stay clear of stone when starting machine!

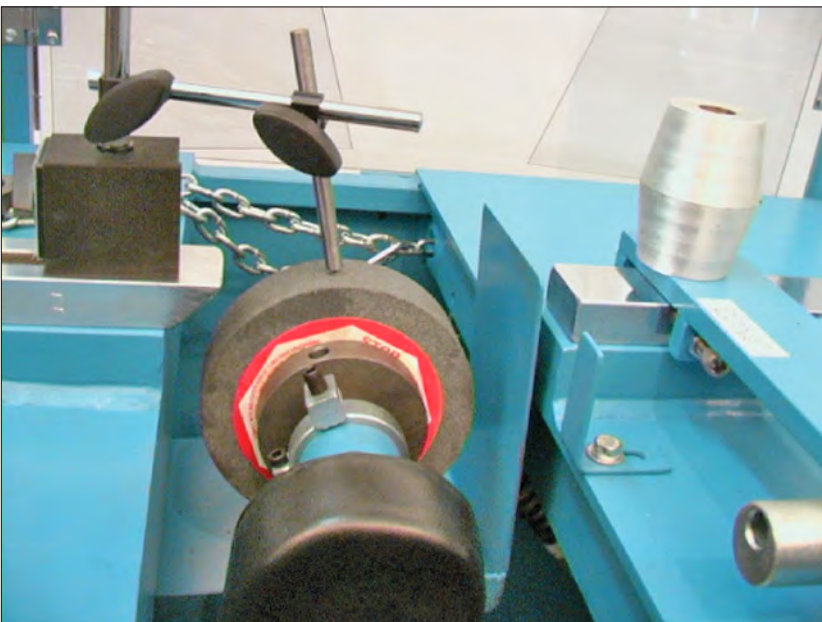
Disengage the grinding head.

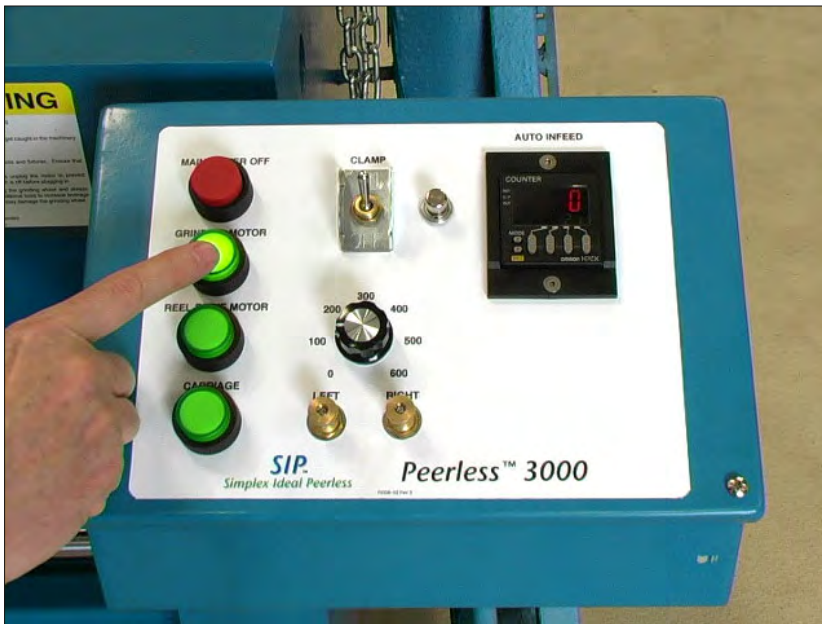


Mount the diamond dresser on to the magnetic base.



Clamp the magnetic base on to one of the reel support rails. Position the diamond dresser tip on the top of the stone.

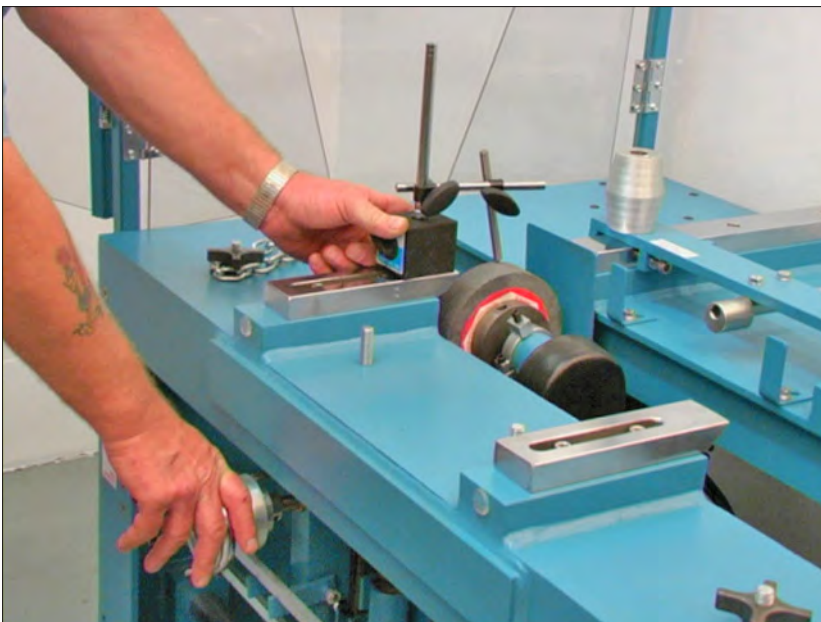




Turn on the grinding motor.



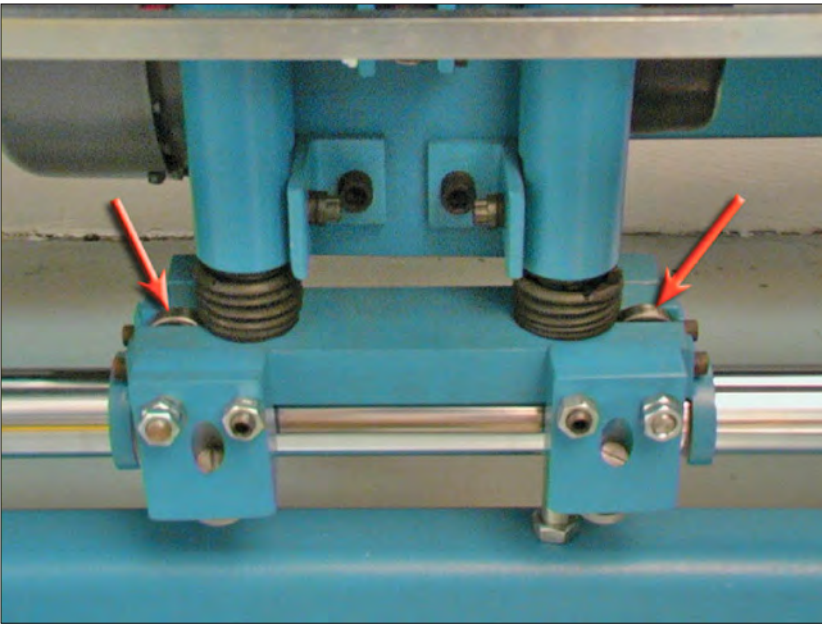
Feed the grinding head up until it just touches the diamond dresser.



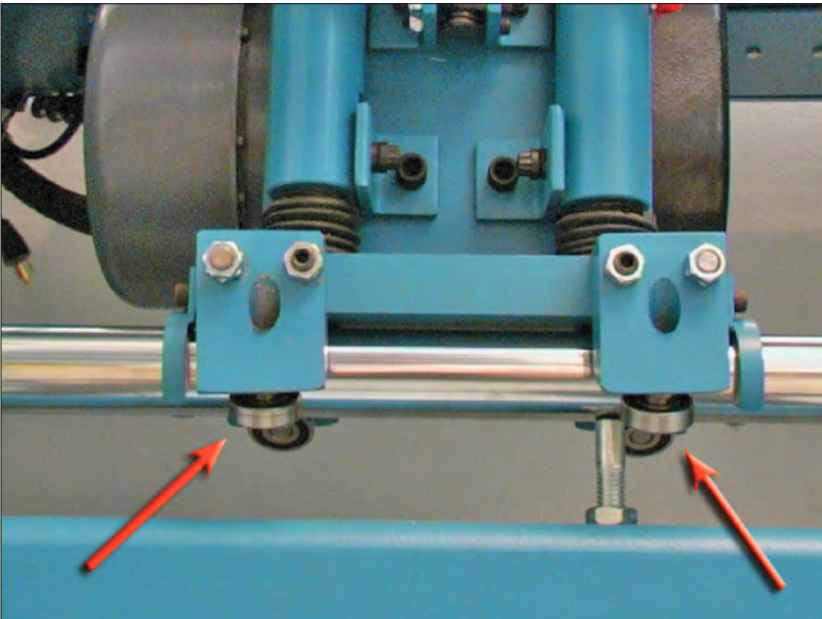
As you hold the magnetic base, move the grinding head back and forth and slowly infeed the stone until the stone is clean and true.

6.4 Adjusting the grinding head bearings

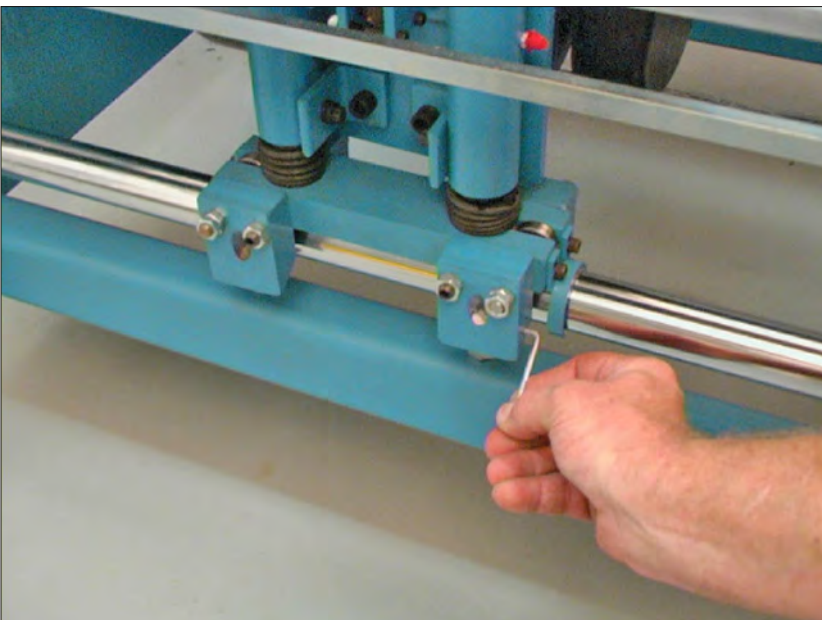
The two bearings on the top of the bottom bearing block do not need adjusting.

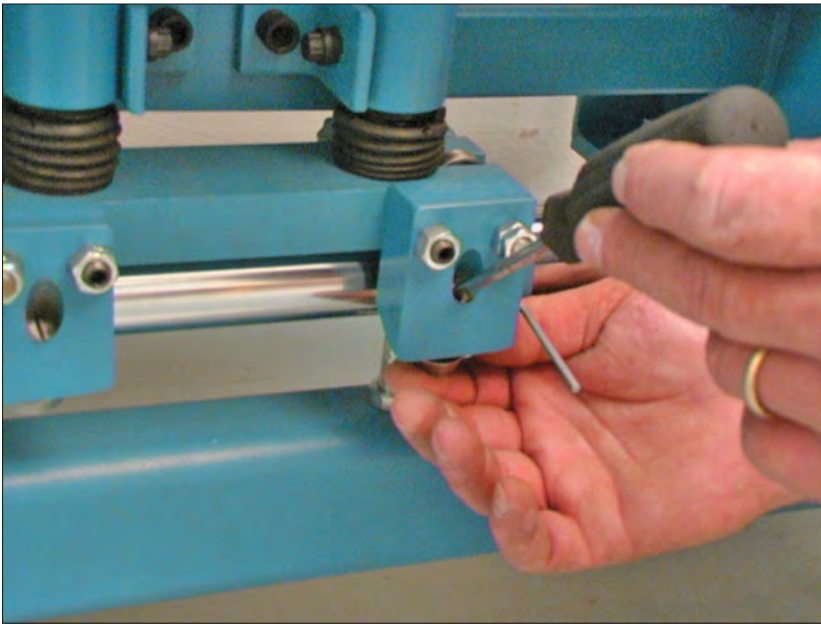


The remaining eight bearings, four on the top track shaft and four on the bottom are mounted on eccentric axles and may need occasional adjusting.

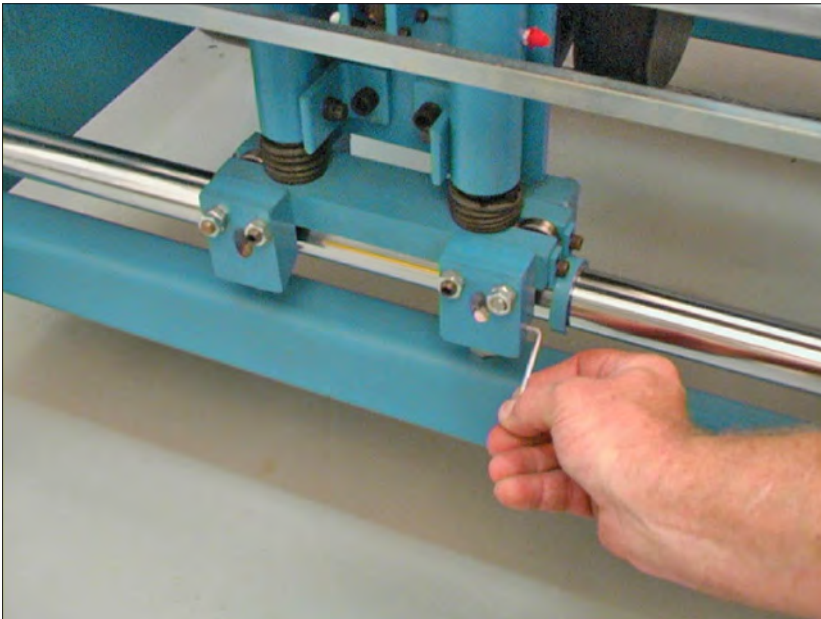


Loosen the set screw which locks the bearing axle.

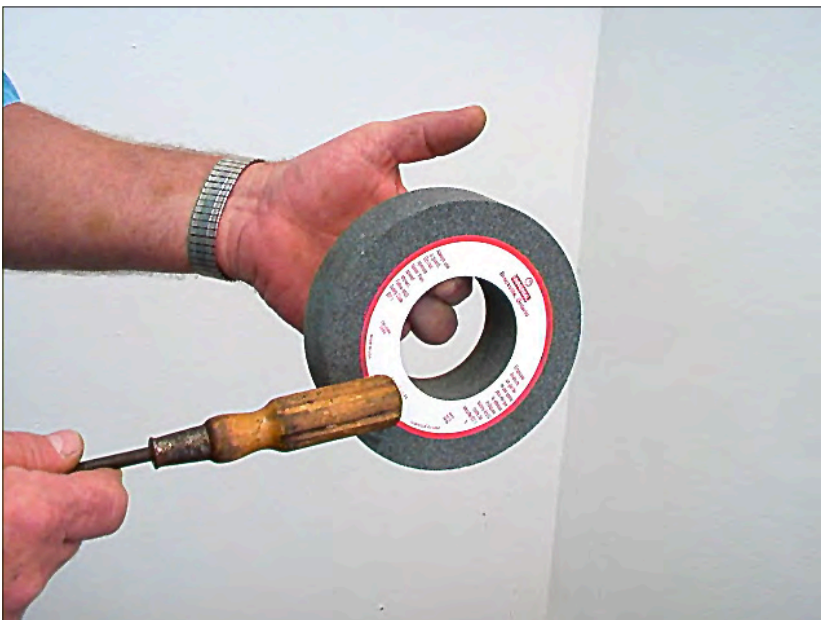




With a screwdriver, turn the axle so that bearing just touches the chromed track shaft.



Retighten the locking set screw. The bearing should just touch the track shaft and slip when turned. Not all bearings will be in full contact with the track shaft over its full length.

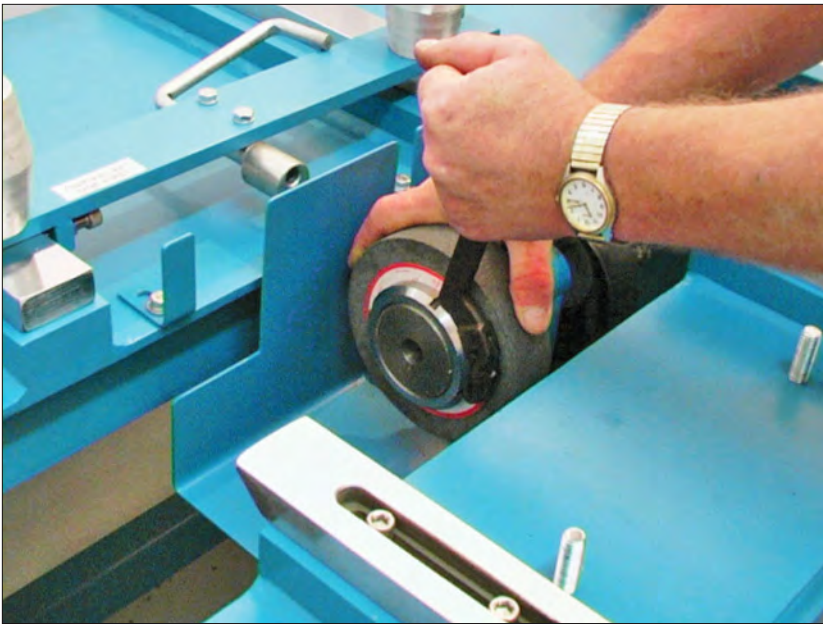


6.5 Mounting the grinding wheels

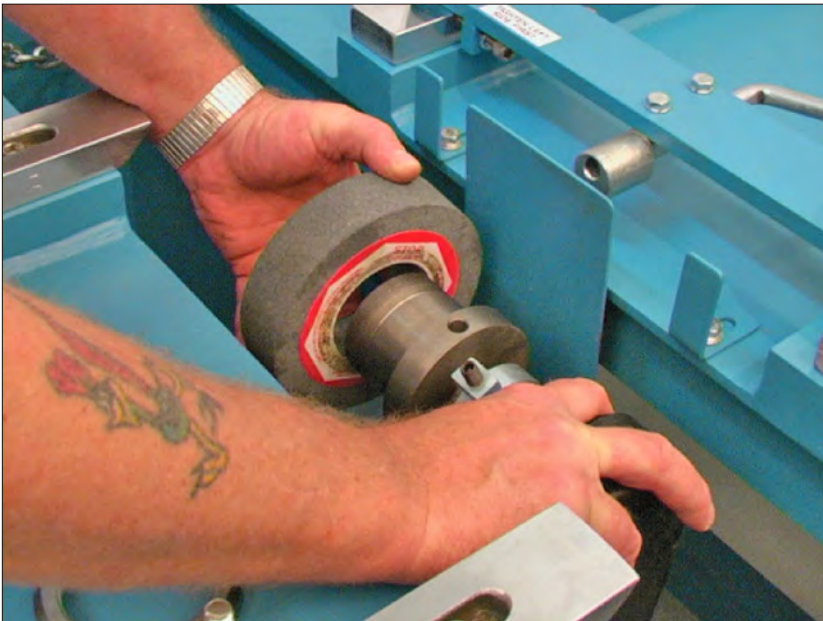


A defective grinding wheel can cause damage, serious injury or death.

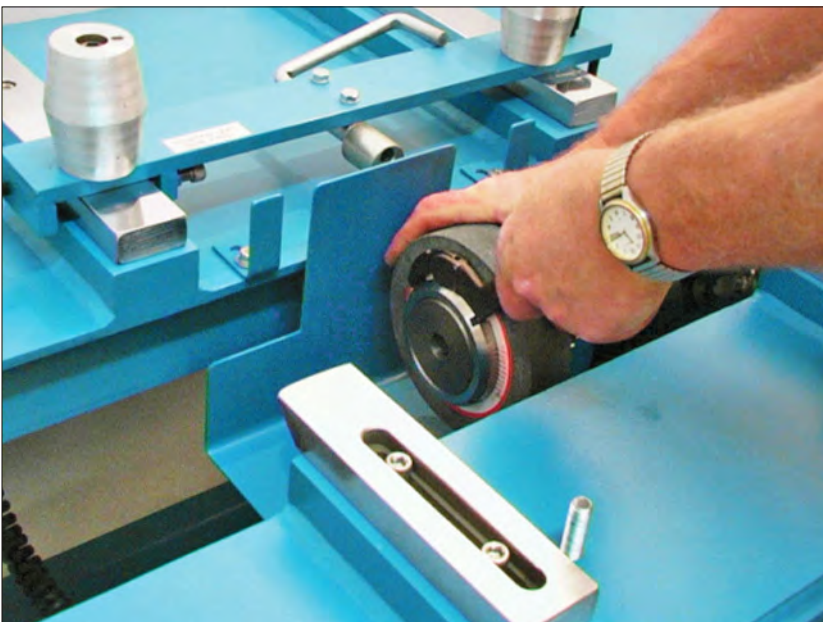
Ring the new stone to ensure it is undamaged. Do this by holding it in the arbor hole and gently tapping it with the wooden handle of a screw driver or similar tool. If the stone does not ring do not use it.



For the spin grinding stone, use the spanner wrench provided, hold the stone and unscrew the wheel nut counterclockwise. Remove the stone.



Place the new stone on the hub



Do not overtighten. You will damage the stone.

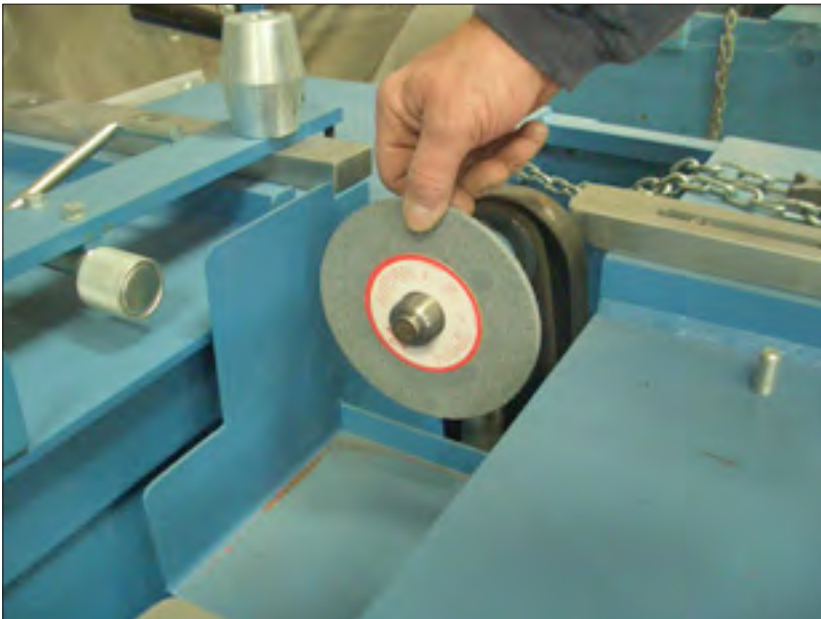
Replace the wheel nut and tighten with the spanner wrench provided. Do not overtighten as you may damage the stone. You may remove the hub assembly and mount it carefully in a vise for tightening.



Use extra caution when turning the grinding motor on and off the first few times after you have mounted the stone. If the nut is not tight enough, it and the stone may come off when you turn the motor off.



For the relief grinding stone, use the u-wrench provided, hold the stone and unscrew the wheel nut counterclockwise. Remove the stone.



Place the new stone on the hub

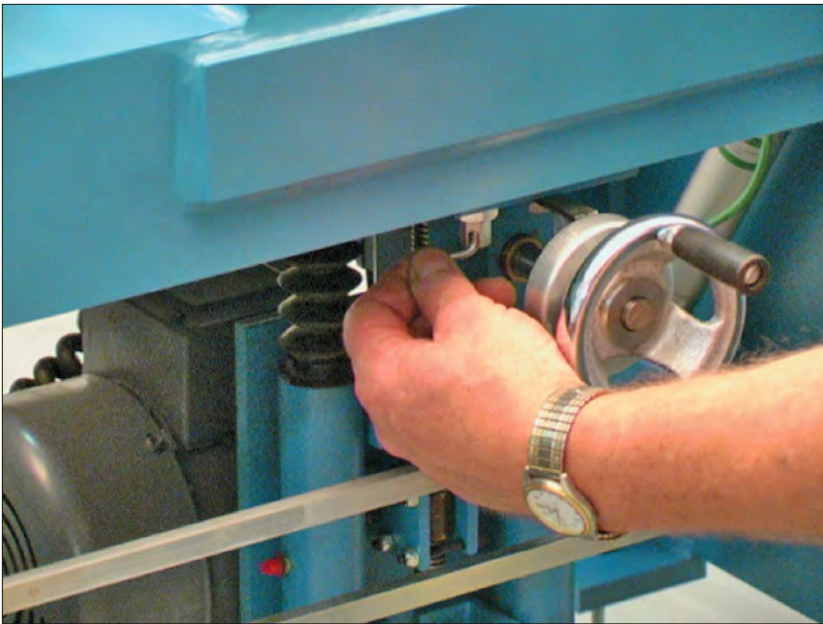


Do not overtighten. You will damage the stone.

Replace the wheel nut and tighten with the u-wrench provided. Do not overtighten as you may damage the stone. You may remove the hub assembly and mount it carefully in a vise for tightening.

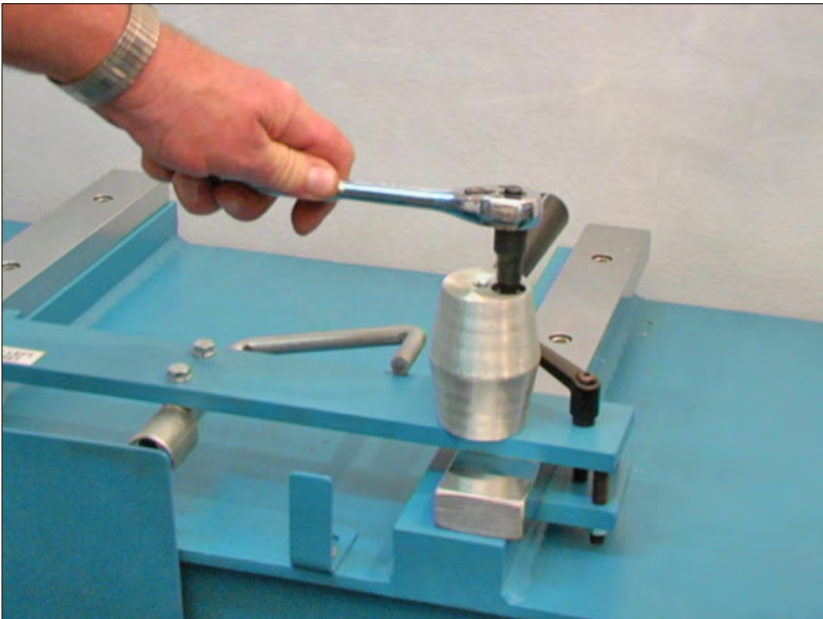


Use extra caution when turning the grinding motor on and off the first few times after you have mounted the stone. If the nut is not tight enough, it and the stone may come off when you turn the motor off.

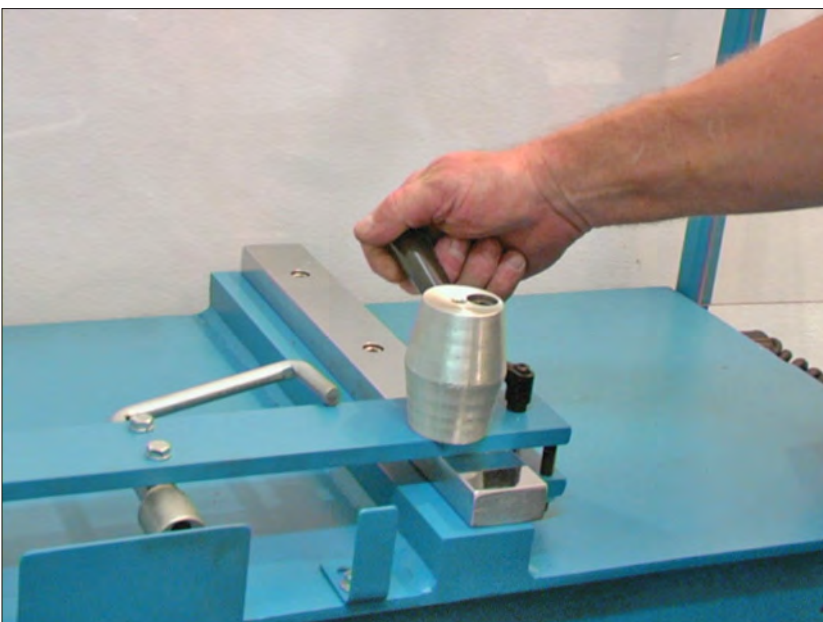


6.6 Aligning the fence

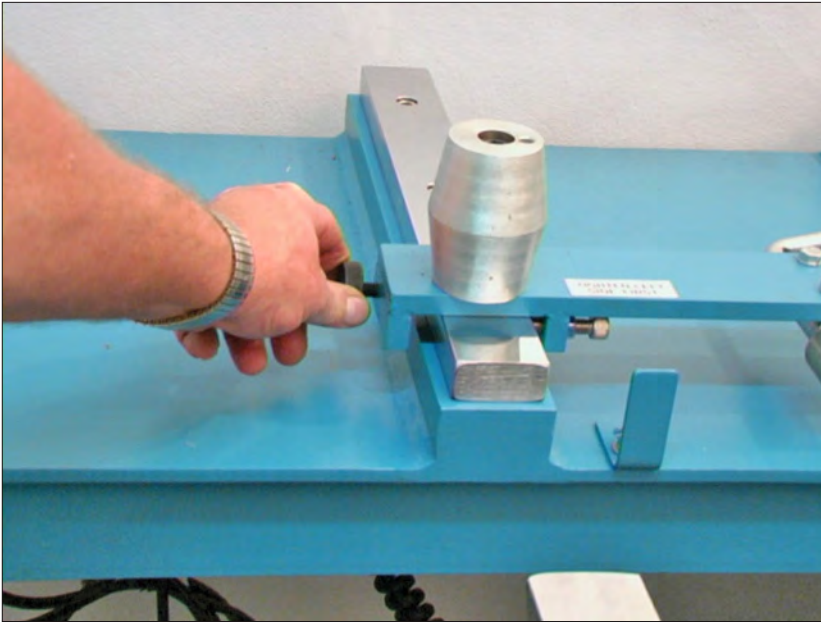
Disengage the grinding head.



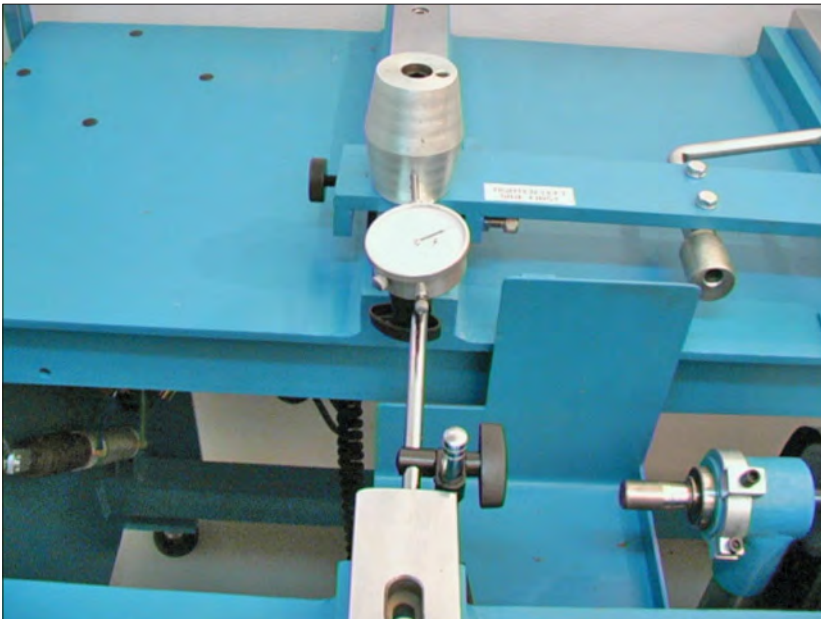
Make sure that the eccentric fence post is in the aligned position by loosening the bolt



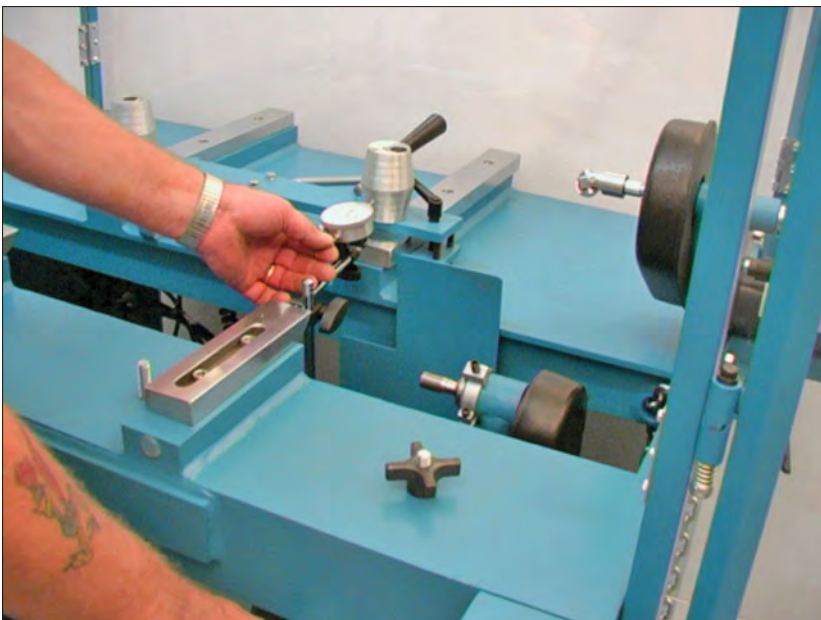
Then rotate the post until the detente clicks, then retighten the post



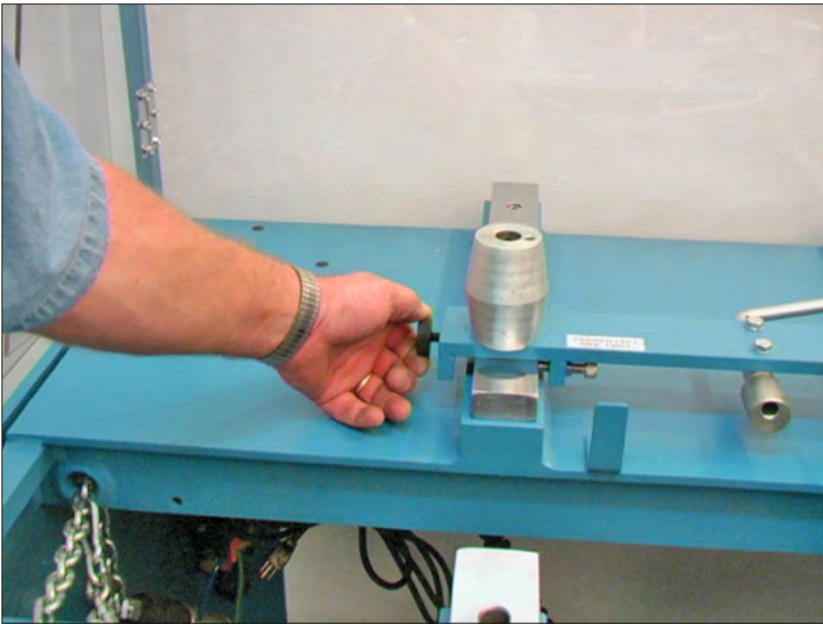
Lock the fence in position with the left side locking knob only.



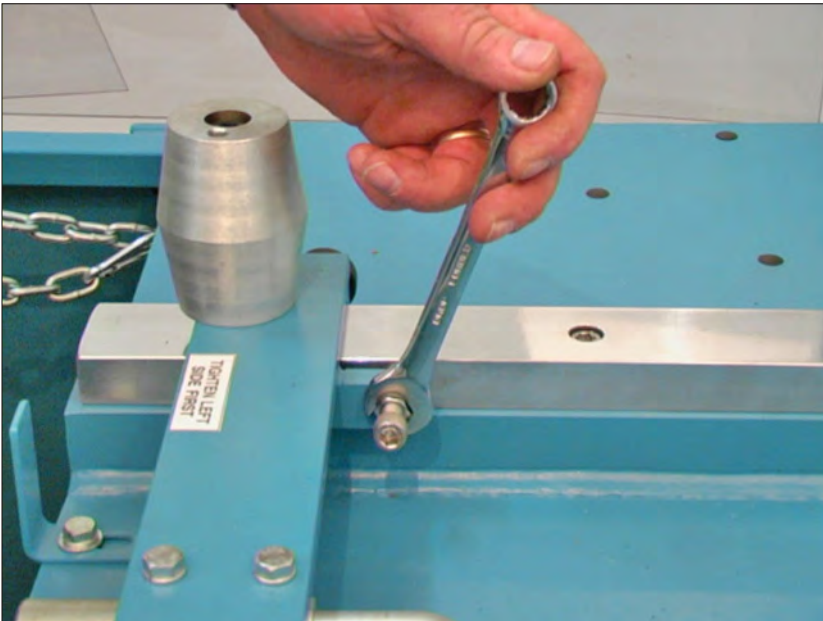
Move the grinding head to the left side of the fence. Place the magnetic base on the dust collector so that the tip of the indicator measures the fence. With the dial indicator point on the high point of the fence, turn the bezel so that the pointer lines up to zero.



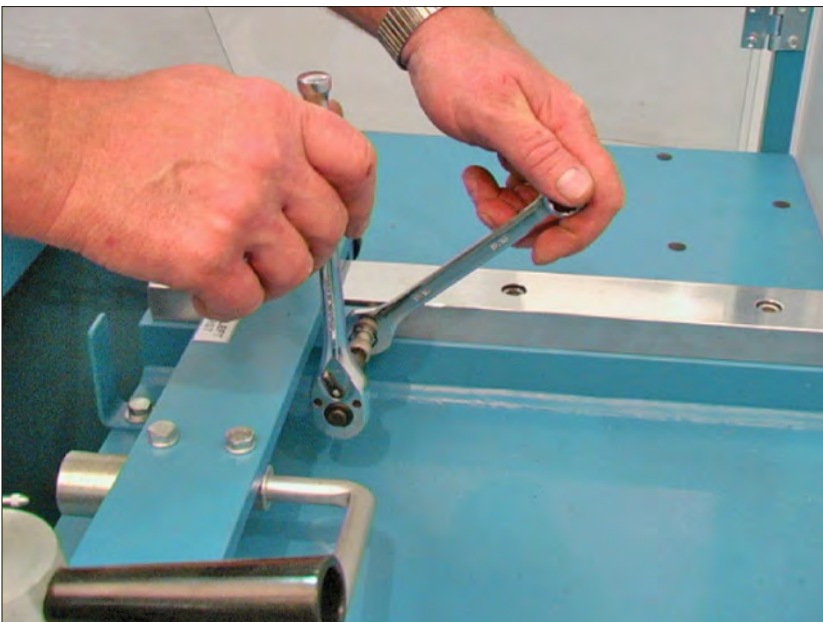
Pulling the plunger on the dial indicator out so that it does not hit the side of the fence, move the grinding head to the high point of the right side of the fence. If the difference is greater than .010, you should realign the fence.



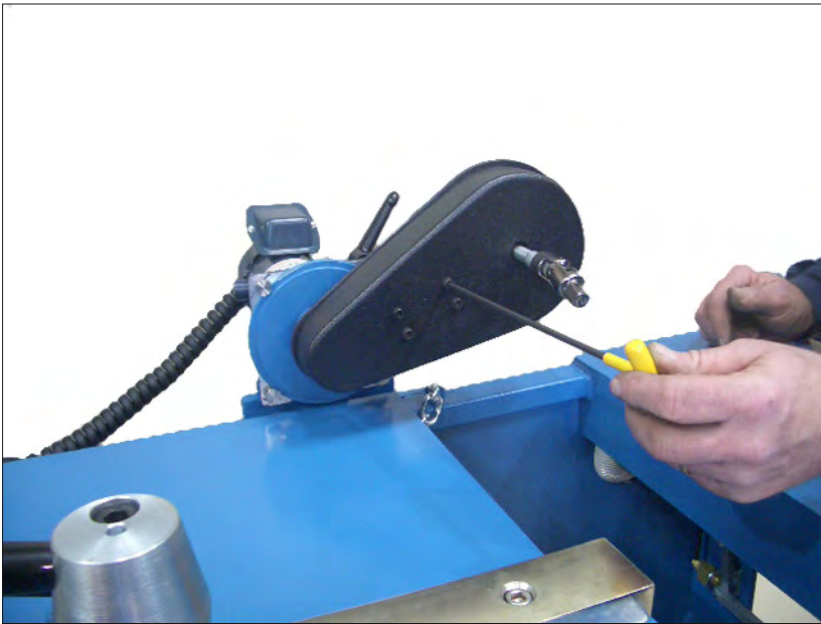
Loosen the left locking knob.



Loosen the rear jam nut on the left rear of the fence.

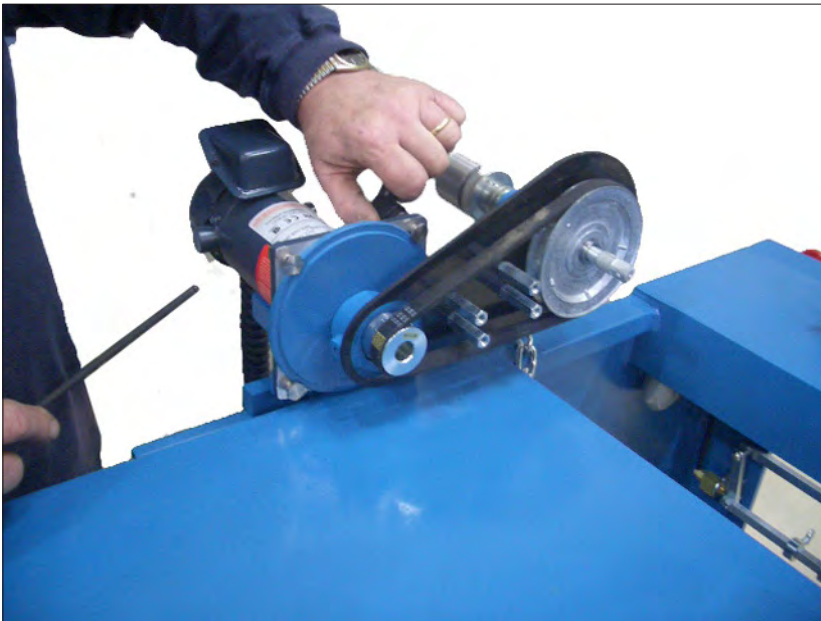


Adjust the socket head bolt until the both sides are within .010 with the locking knob and jam nut tight. It may take several tries in order to compensate for tightening the locking knob and jam nuts.

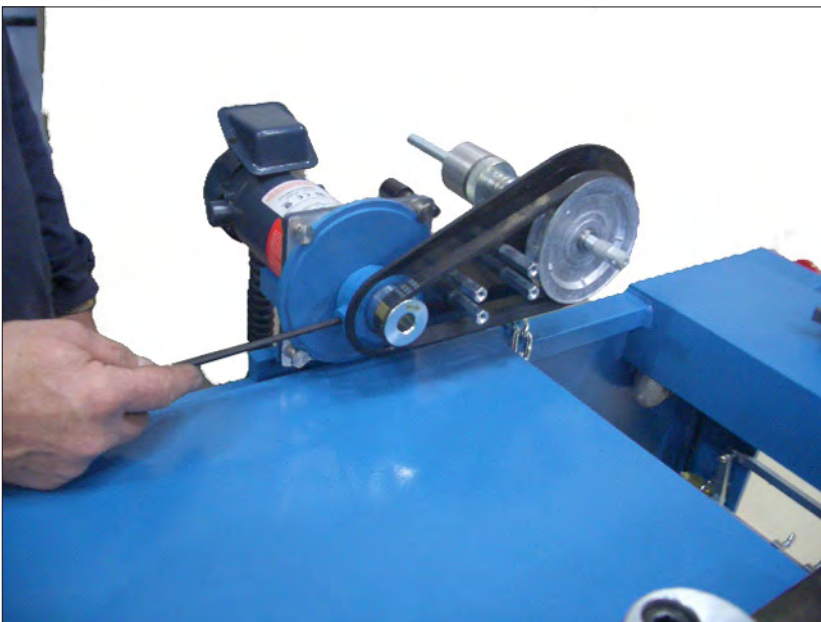


6.7 Adjusting the spin motor belt

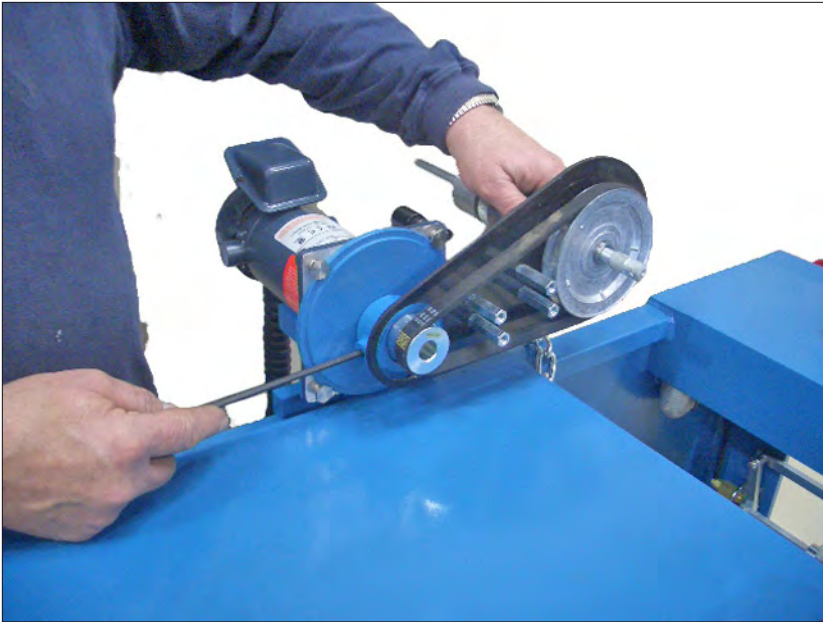
Remove the belt guard.



Lock the radius arm.



Loosen set screw in the end of the radius arm.



Rotate the arm around the cam to loosen or tighten the belt. Retighten the set screw.



Replace the belt guard.



6.8 Adjusting the grinding motor belt

Loosen bolts which mount the motor. Slide the motor up or down. Retighten the motor bolts.