

**SIP**<sup>TM</sup>  
SIMPLEX IDEAL PEERLESS



# IDEAL<sup>TM</sup> 55 & 65 OPERATING MANUAL

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# 1. INTRODUCTION

## 1.0 Introduction

Thank you for selecting the Simplex•Ideal•Peerless Reel Mower Grinder. The Peerless 2000 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](http://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 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.



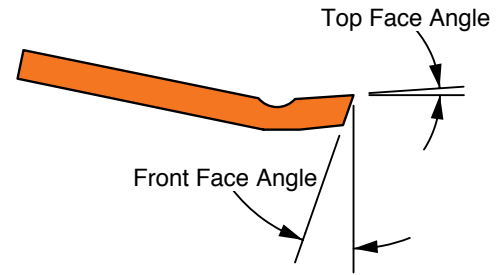
***Do not overtighten the nut as it will cause the grinding wheel to explode!***

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.

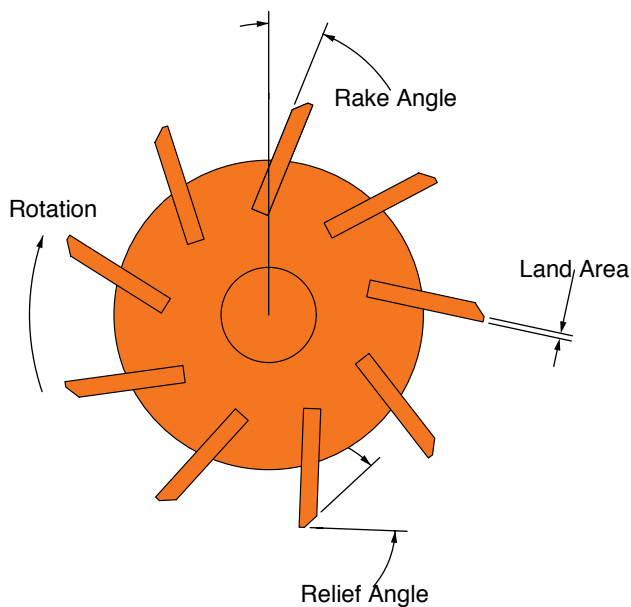
## 1.2 Principles of Sharpening

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.



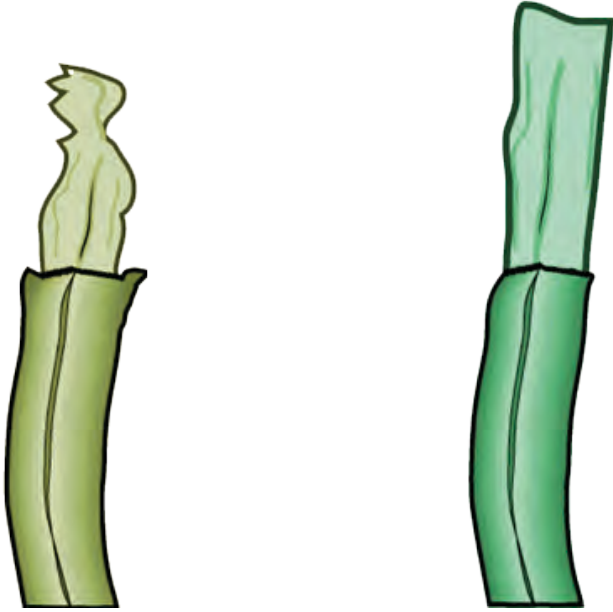
The bed knife **Front Face Angle** is used to support the blade as it is being cut. It does not need to be ground regularly as it does not wear and change shape. Bed knife life increases, however, by grinding both the top and front surfaces of the bed knife to eliminate the rounded edge. The bed knife **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.



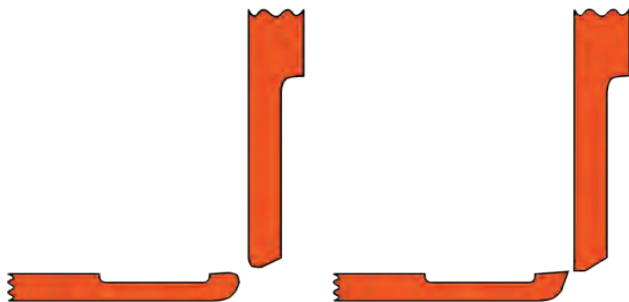
The figure above shows the different features of the reel mower blades. The reel blade **Relief Angle** serves to reduce the contact area between the reel and the bed knife. It is created by individually relief grinding each reel blade. The **Land Area** indicates how much of the reel blade is contacting 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.

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:



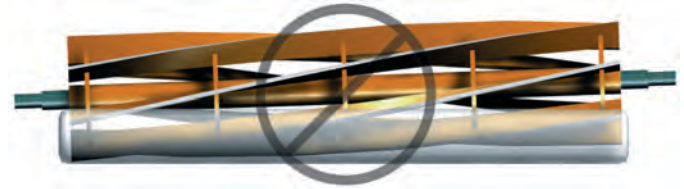
1. Significantly rounded blade edges.
2. Bent or nicked reel blades which cause streaking or irregular contact between reel blades.
3. Uneven blade wear.
4. Significantly cone shaped.
5. When all or most of the relief is worn away.

### 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.



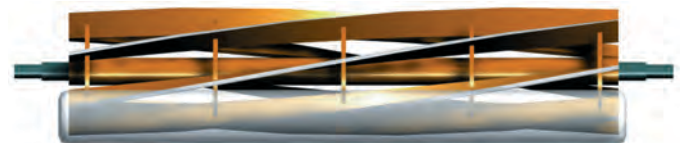
Through normal wear or improper grinding the reel will become cone shaped.



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.

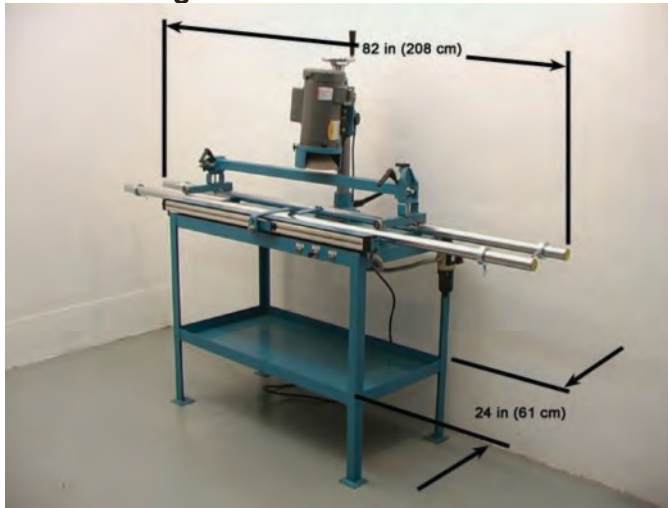


Only the Peerless 2000 is designed to grind the reels parallel to the rollers and make it easy to parallel the rollers to each other.



## 2. SET UP

### 2.0 Locating Your Grinder



Determine where on a concrete slab the Ideal 1000 will be located.

The Ideal 1000 requires standard 110 volt, 60 Hz, single phase service. Foreign versions with 200 volt, 50 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.

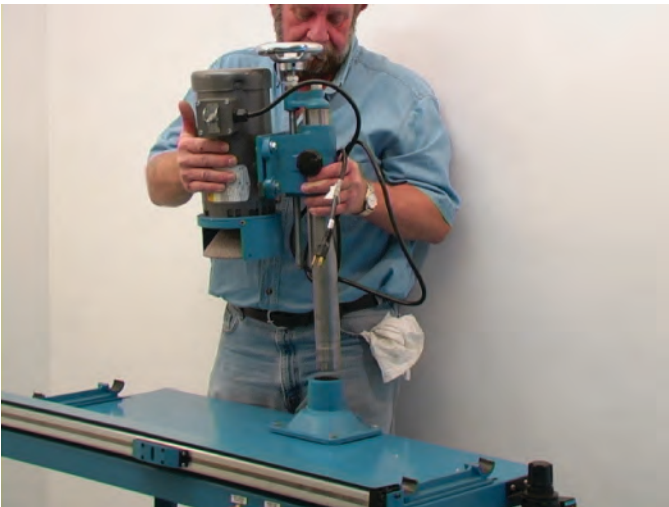
## 2.2 Assembling the grinder



Layout parts to ensure that nothing is missing.



Grease the post base.

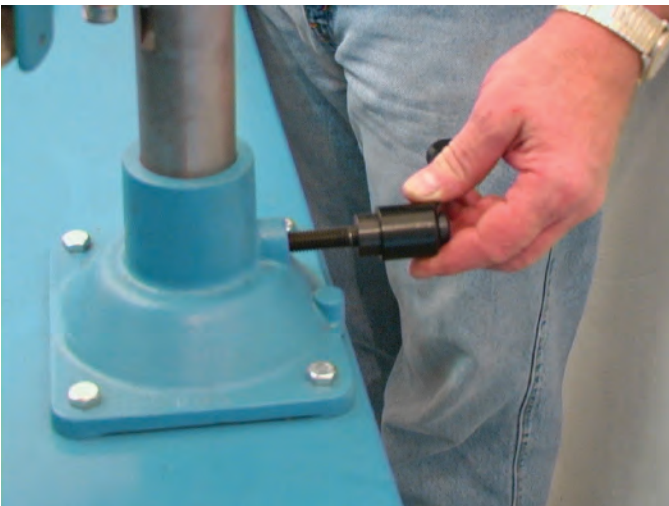


Attach the handle to the hand wheel.



**Grinding head is heavy, use caution when lifting..**

Carefully place the grinding head assembly in the post base on the table.



Screw in the locking handle in the base of the post.

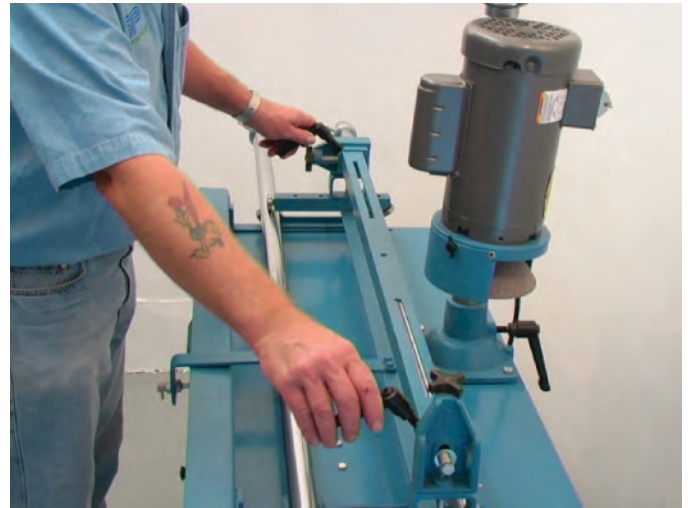


Place the chrome track shafts on the track shafts supports.

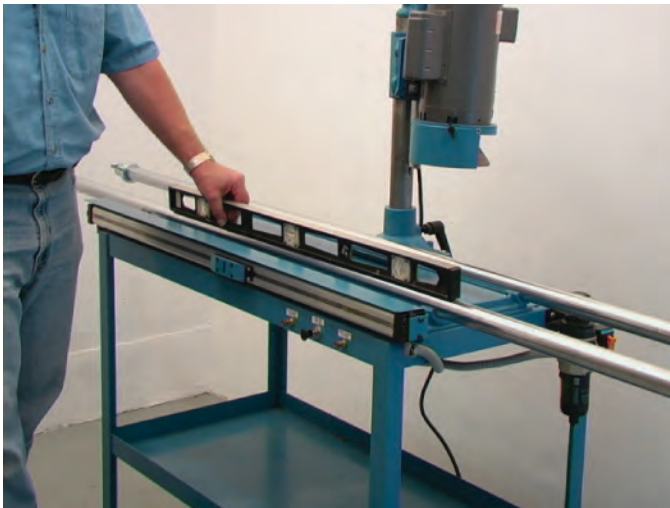




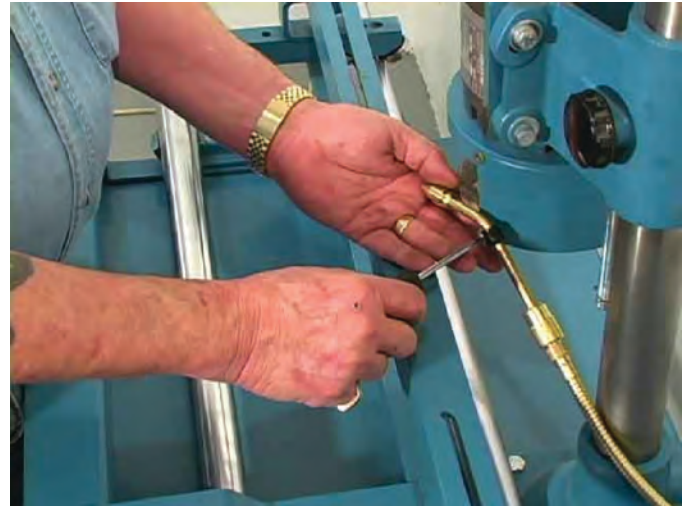
Mount the carriage stops on the track shafts.



Loosen both locking handles so that the carriage seats properly on the track shafts, then retighten the locking handles.



Check the grinder for level. Use shims or leveling pads as necessary.



Mount the optional mister's nozzle to the wheel guard.



Place the carriage on the track shafts.



### 2.3 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

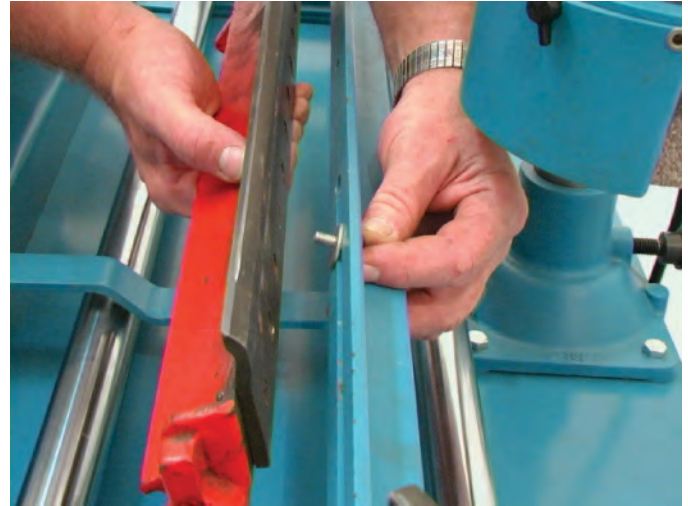


Clean all dirt, grass, rust, grease, and oil from the mower assembly, especially where it accumulates behind the lip of the bed knife.



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.

## 3.1 Mounting the bed knife to the carriage bar



Remove the third bed knife screw from each end of the bed knife, then use the appropriate screw and washer to mount the bed knife to the carriage bar.



Make sure that you have a washer between the bed knife and the carriage bar as this prevents distortion of the bed knife when you clamp it.



### 3.2 Mounting the bed knife in the optional clamps



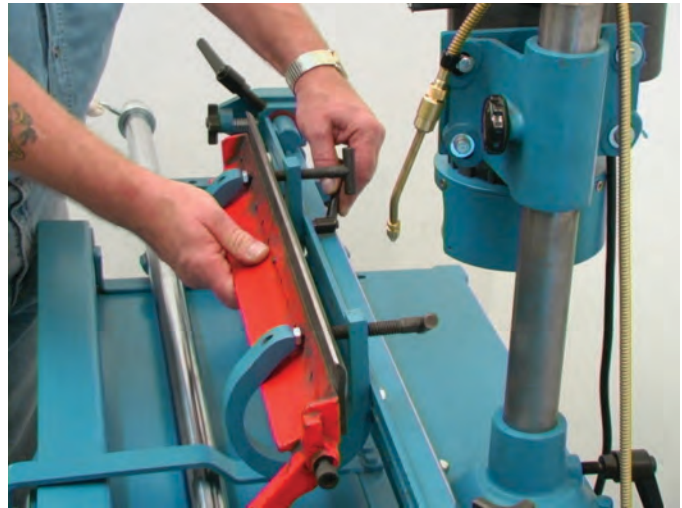
Mount the first clamp using the bolt and washer.



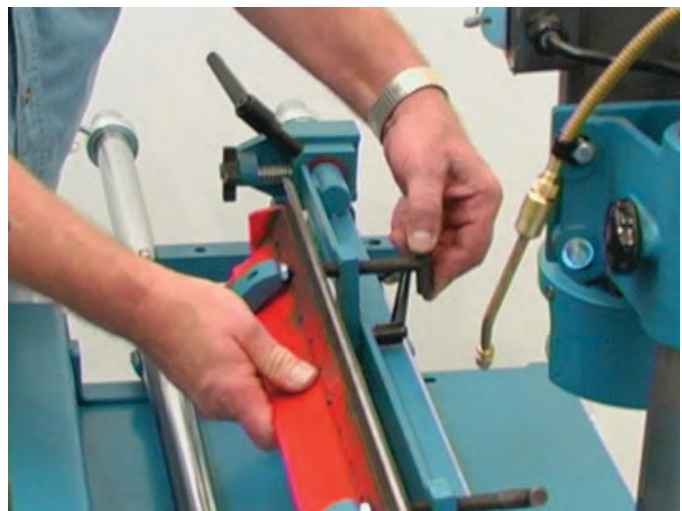
Mount the second clamp using the locking handle.



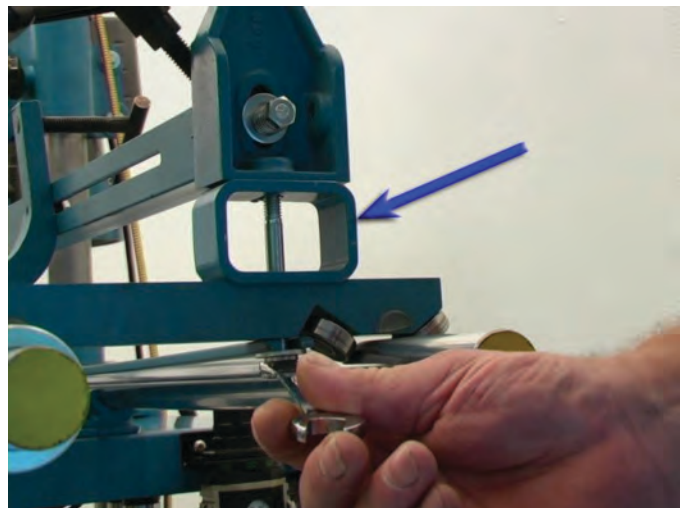
Back off the tee bolts.



Place the bed knife in the clamps.



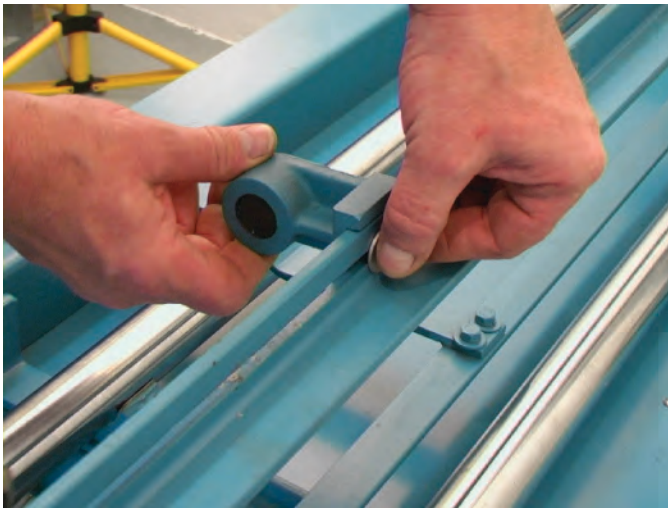
Tighten the tee bolt until the tee handle is horizontal.



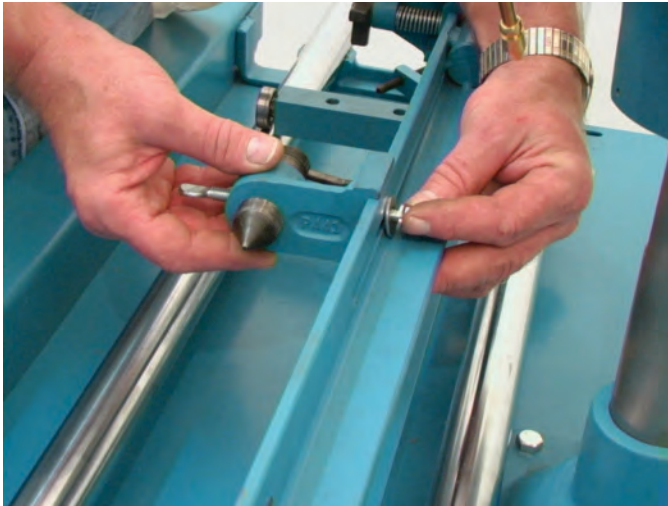
Remove the spacer block and reattach the trunnion with a shorter bolt.



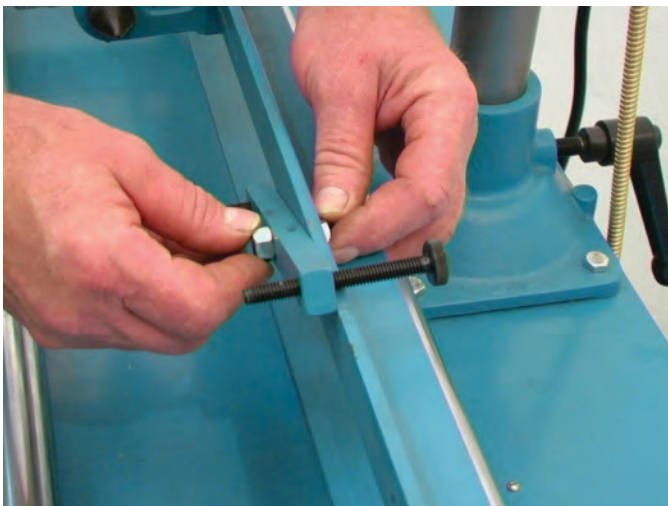
### 3.3 Mounting the bed knife with the optional centers kit.



Mount the fixed center to the carriage bar.



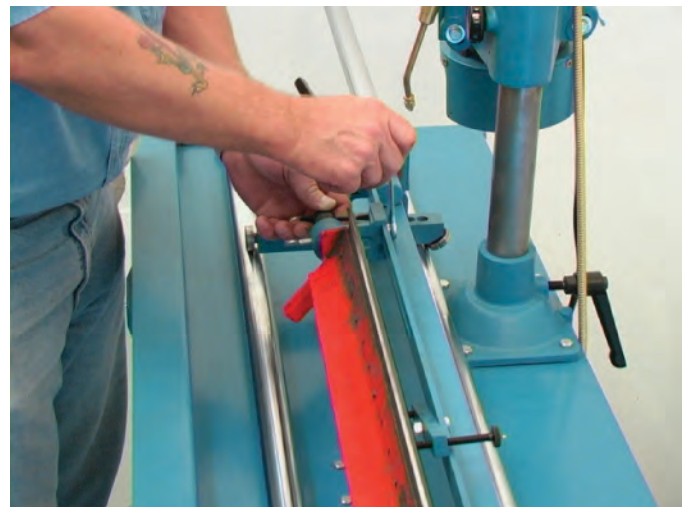
Mount the adjustable center to the carriage bar.



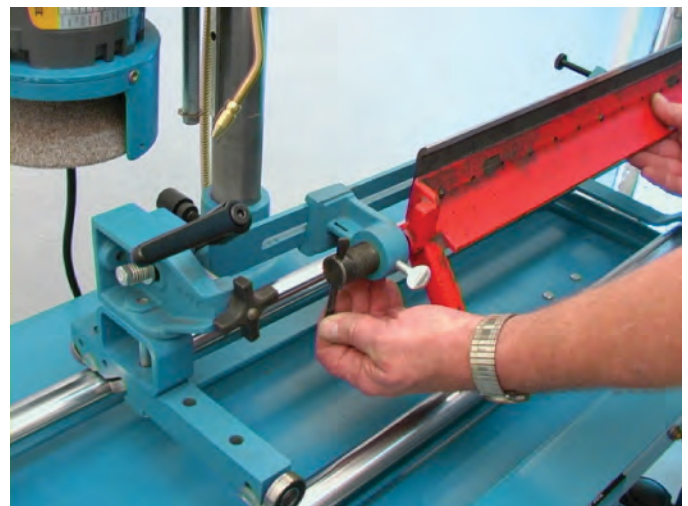
Mount the center support to the carriage bar.



Place the bed knife between centers, aligning the mounting holes with the centers.

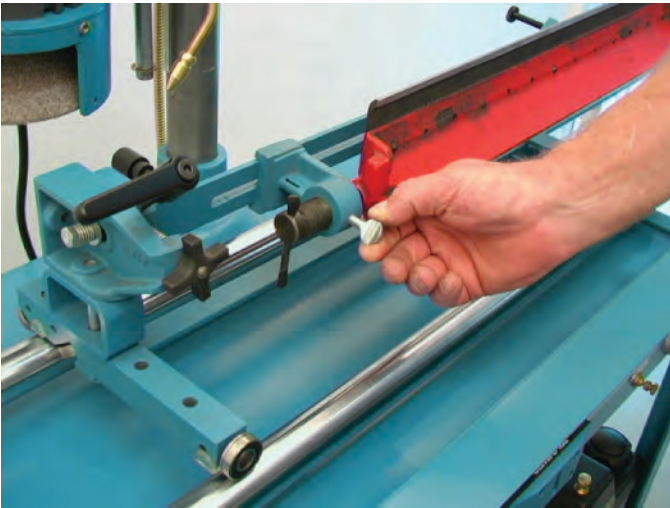


Slide the adjustable center in to the bed knife mounting hole and tighten the locking handle on the carriage bar.

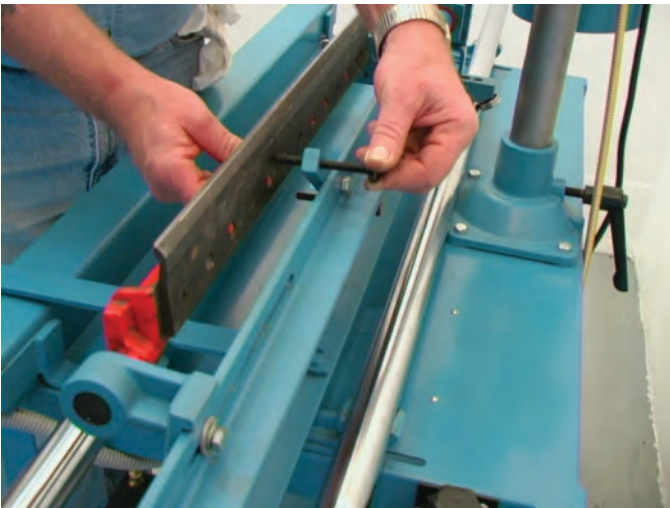


Tighten the adjustable center. Do not over tighten as this will distort the bed knife.

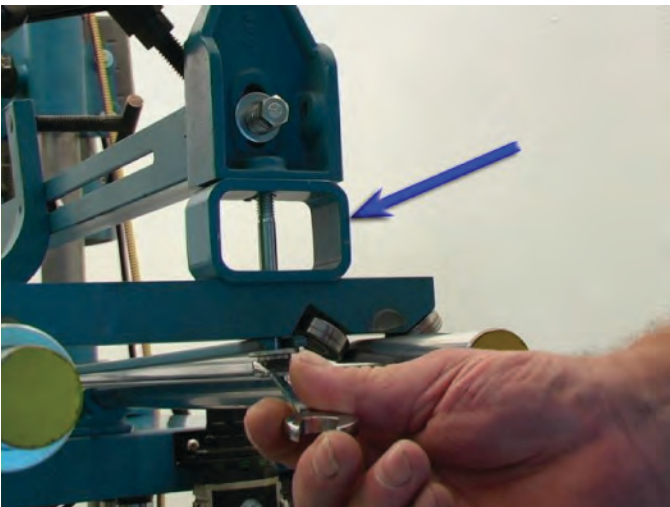




Lock the adjustable center.



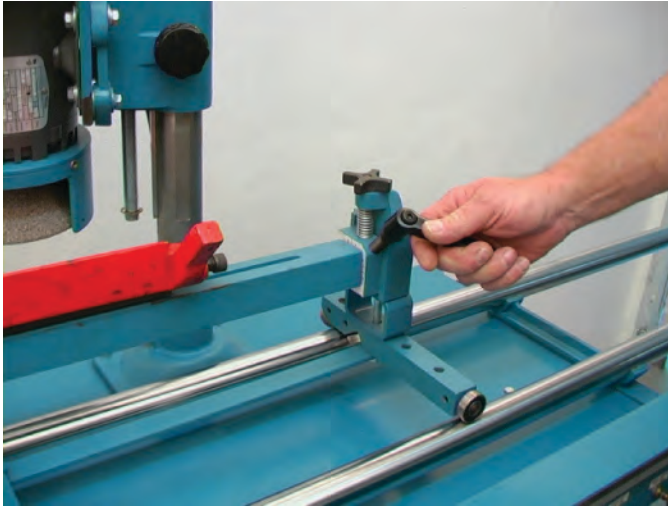
Position and adjust the center support.



Remove the space block and reattach the trunnion with a shorter bolt.

## 4. GRINDING

### 4.0 Aligning the bed knife for top face grinding



Loosen the carriage bar clamps, rotate the bed knife until it is horizontal, then tighten the carriage bar clamps.

Position the wheel guard so it does not interfere with the bed knife.



Lock the wheel guard clamp.



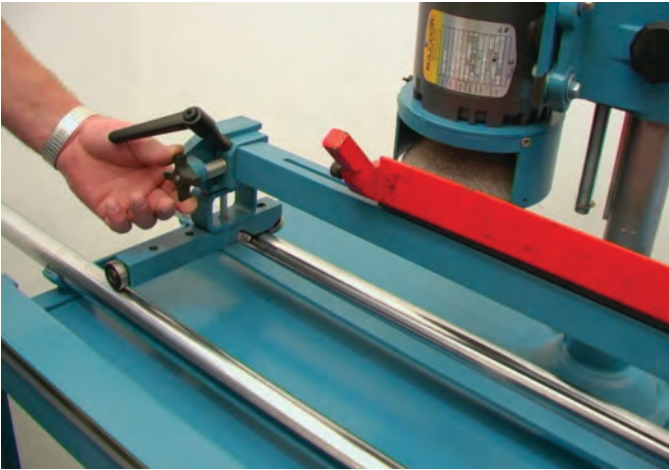
Loosen the wheel guard clamp.



Position the grinding wheel by rotating the head until it just touches the bed knife on the right end. Position and lock the wheel guard.







Move the carriage to the left end of the bed knife and adjust the trunnion until the front of the grinding wheel just touches the bed knife. Double check and readjust as necessary.



Move the carriage to the right end of the bed knife and adjust the trunnion until the grinding wheel just touches the top of the bed knife. Double check and readjust as necessary.



Feed the grinding head up until it just clears the top of the bed knife.

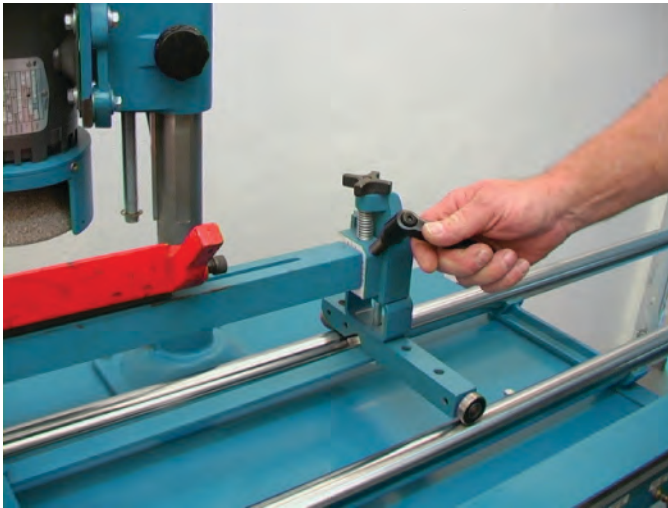


With the grinding head off each end of the bed knife, set the travel stops. (2 on the 55, 4 on the 65)



Rotate the grinding head until the grinding wheel is over the bed knife. Feed the grinding head down until it just touches the top of the bed knife.

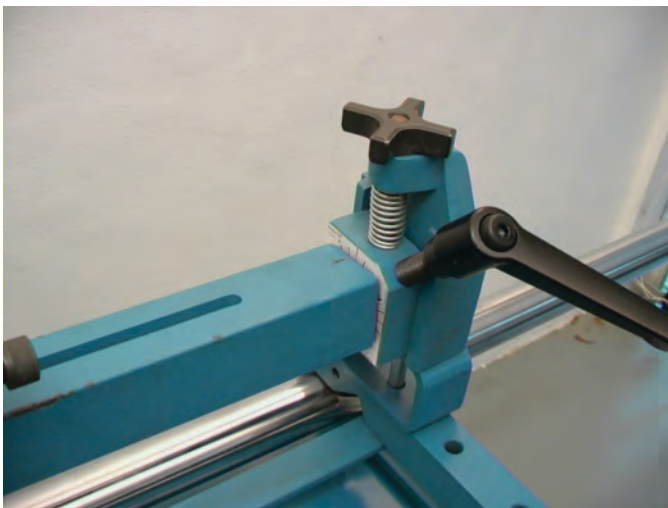
#### 4.1 Setting the relief angle for top face grinding



Loosen the carriage bar clamps.

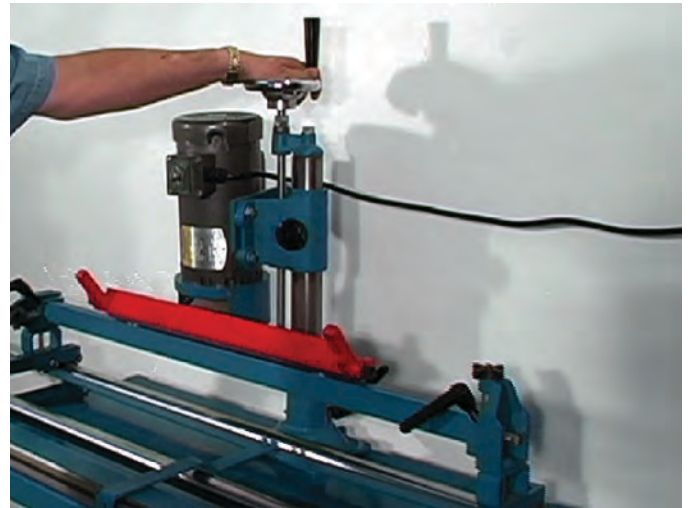


Rotate the carriage bar...

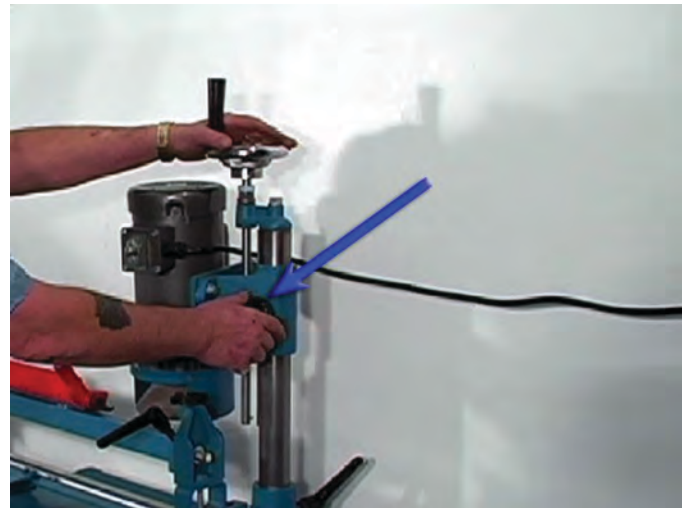


...until you have the desired relief angle, then lock the carriage bar clamps.

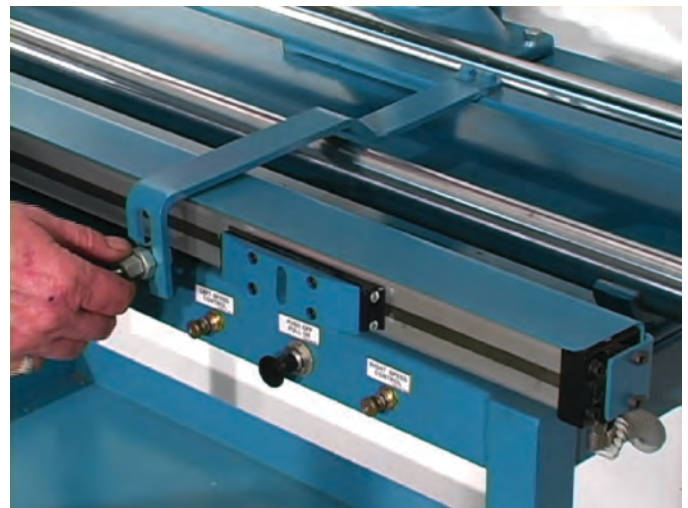
#### 4.2 Grinding the top face



Back off the grinding head so the grinding wheel clears the bed knife.



Snug the motor support to the post.



Engage the carriage travel by turning the latch pin and letting it seat in the pneumatic cylinder.

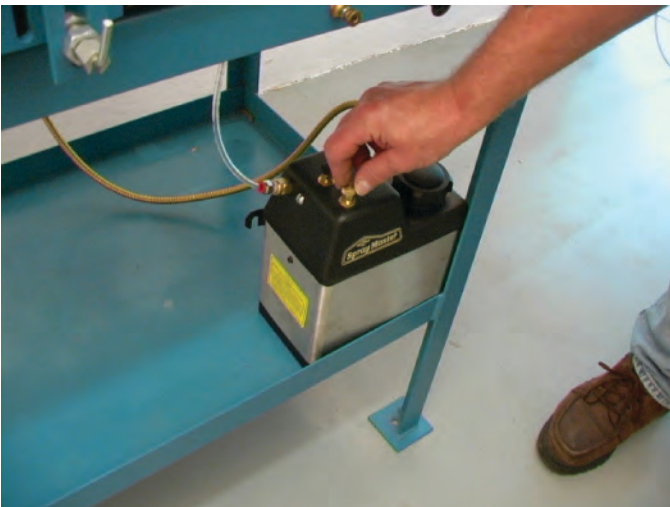




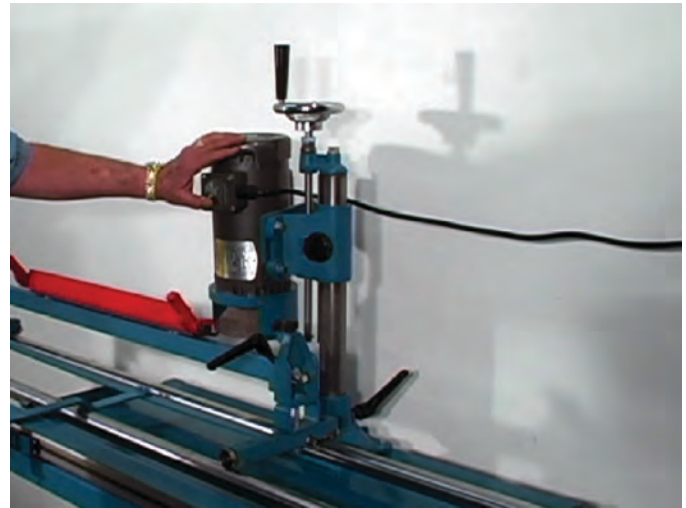
Pull the on-off valve to turn the carriage travel on.



Adjust the carriage speed as necessary.

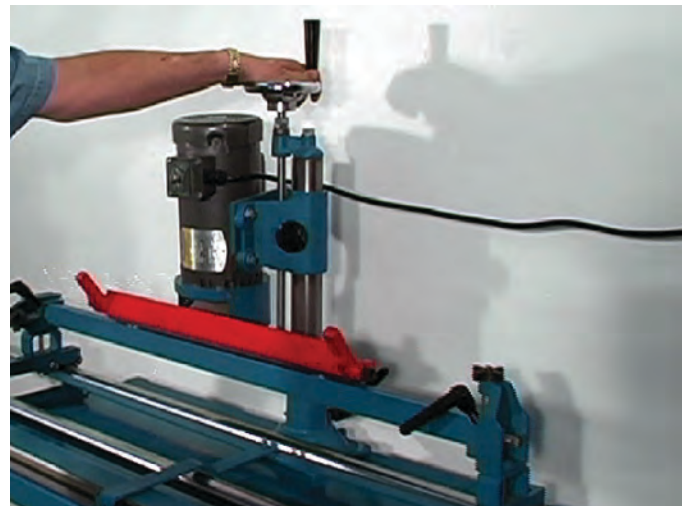


Adjust the coolant mist as necessary.



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

Turn the grinding motor on.



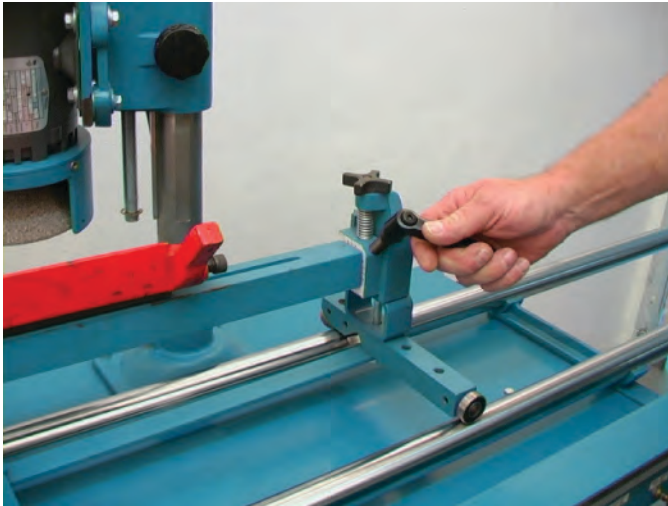
Infeed the grinding head at the heaviest part of the bed knife. Continue to grind until the bed knife is sharp.



Turn the carriage off first then turn the grinding motor off.



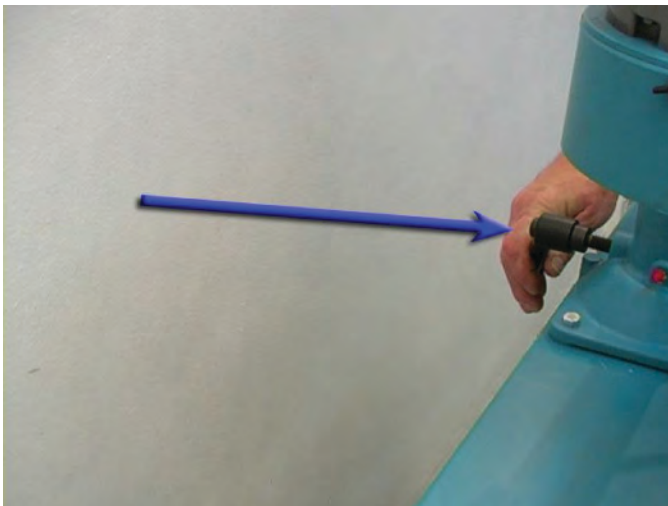
### 4.3 Aligning the bed knife for front face grinding



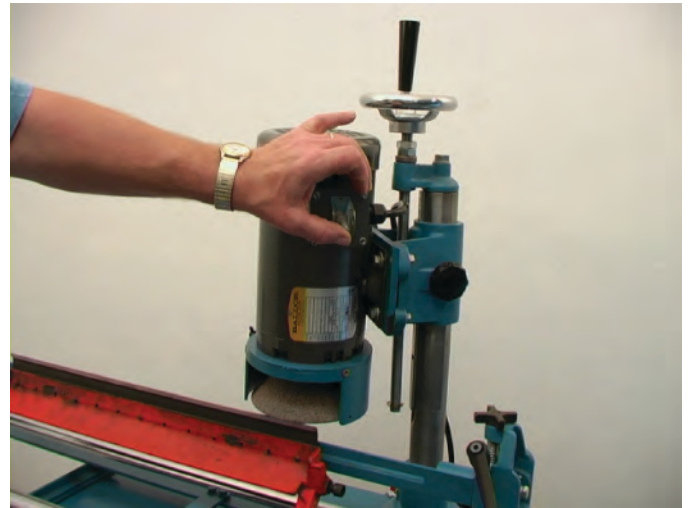
To grind the front face, unlock the carriage bar.



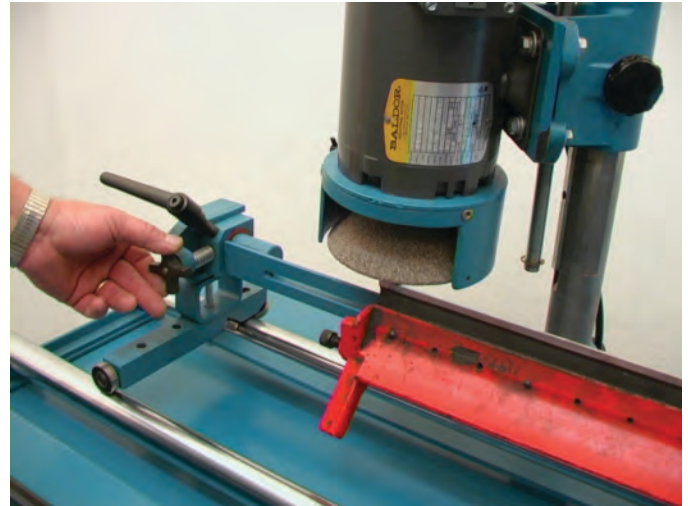
Rotate the carriage bar so the front face of the bed knife is up, then relock the carriage bar



Unlock the grinding head.



At the right end of the bed knife, reposition the grinding wheel so it just aligns with the top edge of the bed knife



Move the carriage to the right and adjust the left trunnion so the grinding wheel again aligns with the top edge of the bed knife. Double check and readjust as necessary.



Feed the grinding wheel down until it just touches the bed knife.

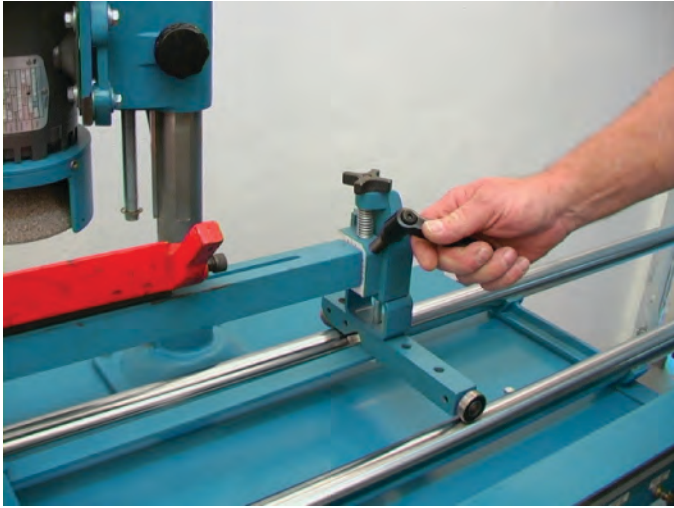


Move the carriage to the right end of the bed knife and adjust the trunnion again until the grinding wheel just touches the bed knife. Double check and readjust as necessary.



Reset the travel stops. The track shafts can be repositioned if necessary for long bed knives.

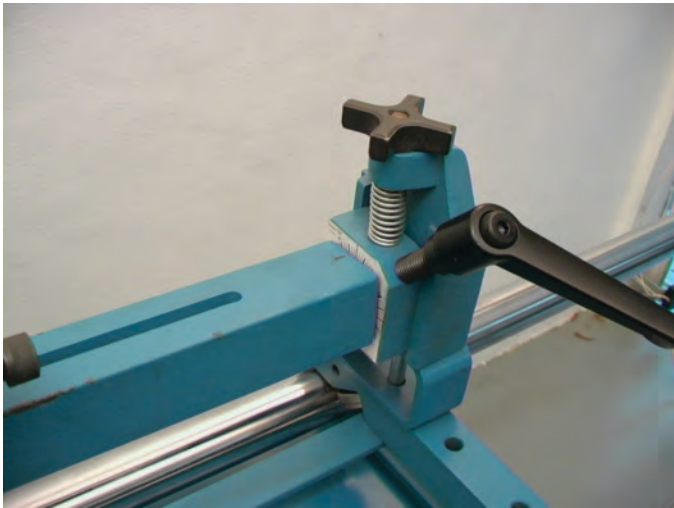
#### 4.4 Setting the relief angle for front face grinding



Loosen the carriage bar clamps.



Rotate the carriage bar...



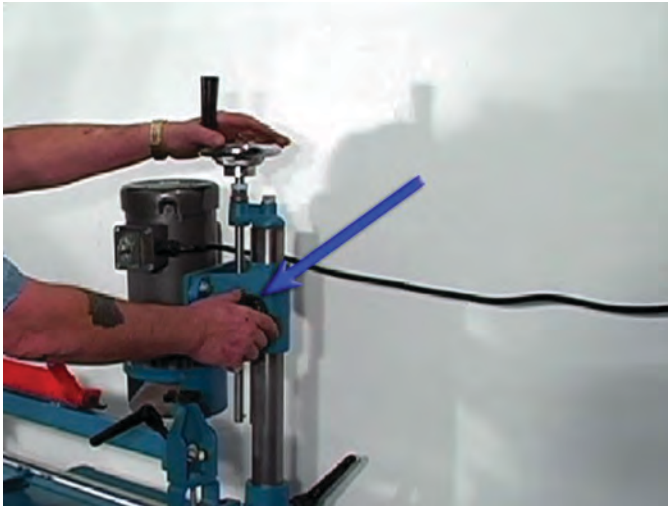
...until you have the desired relief angle, then lock the carriage bar clamps.



#### 4.5 Grinding the front face



Back off the grinding head so the grinding wheel clears the bed knife.



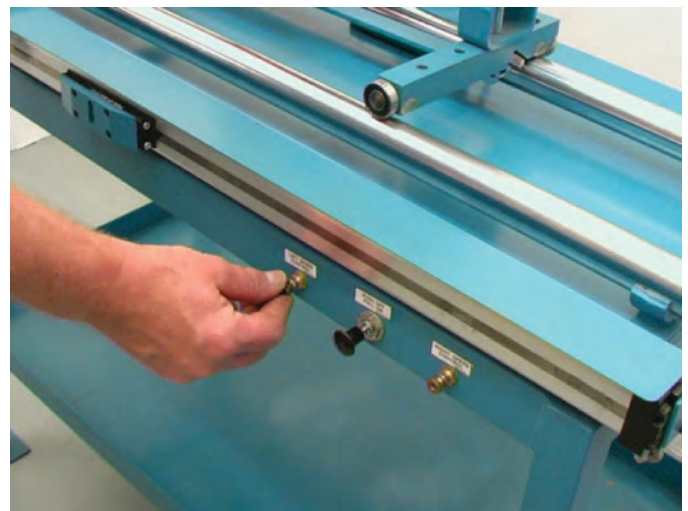
Snug the motor support to the post.



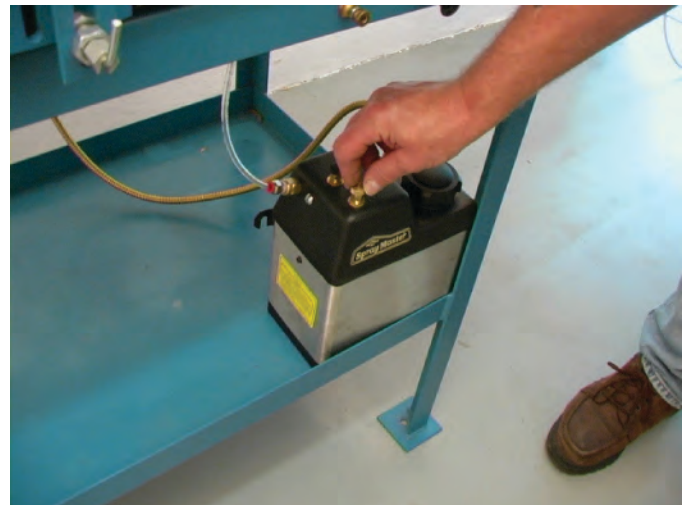
Engage the carriage travel by turning the latch pin and letting it seat in the pneumatic cylinder.<sup>4</sup>



Pull the on-off valve to turn the carriage travel on.

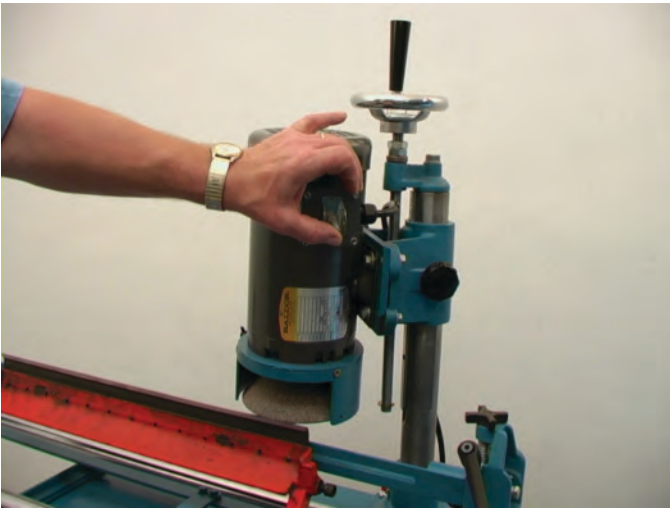


Adjust the carriage speed as necessary.



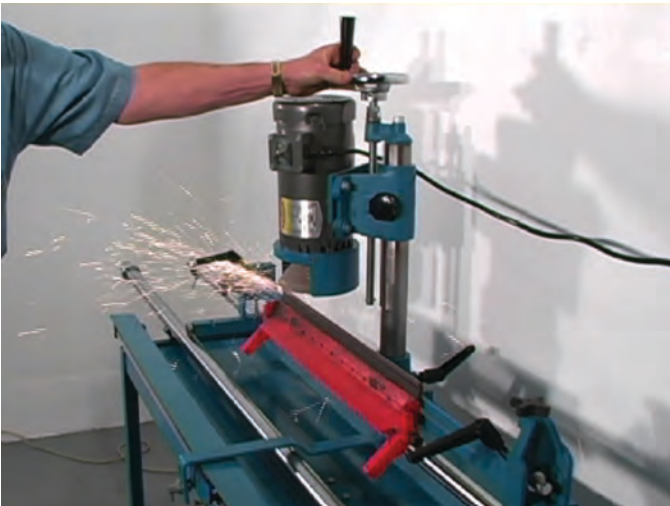
Adjust the coolant mist as necessary.





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

Turn the grinding motor on.



Feed the grinding head at the heaviest part of the bed knife. Continue to grind until the bed knife is sharp.



Turn the carriage off first then turn the grinding motor off.