

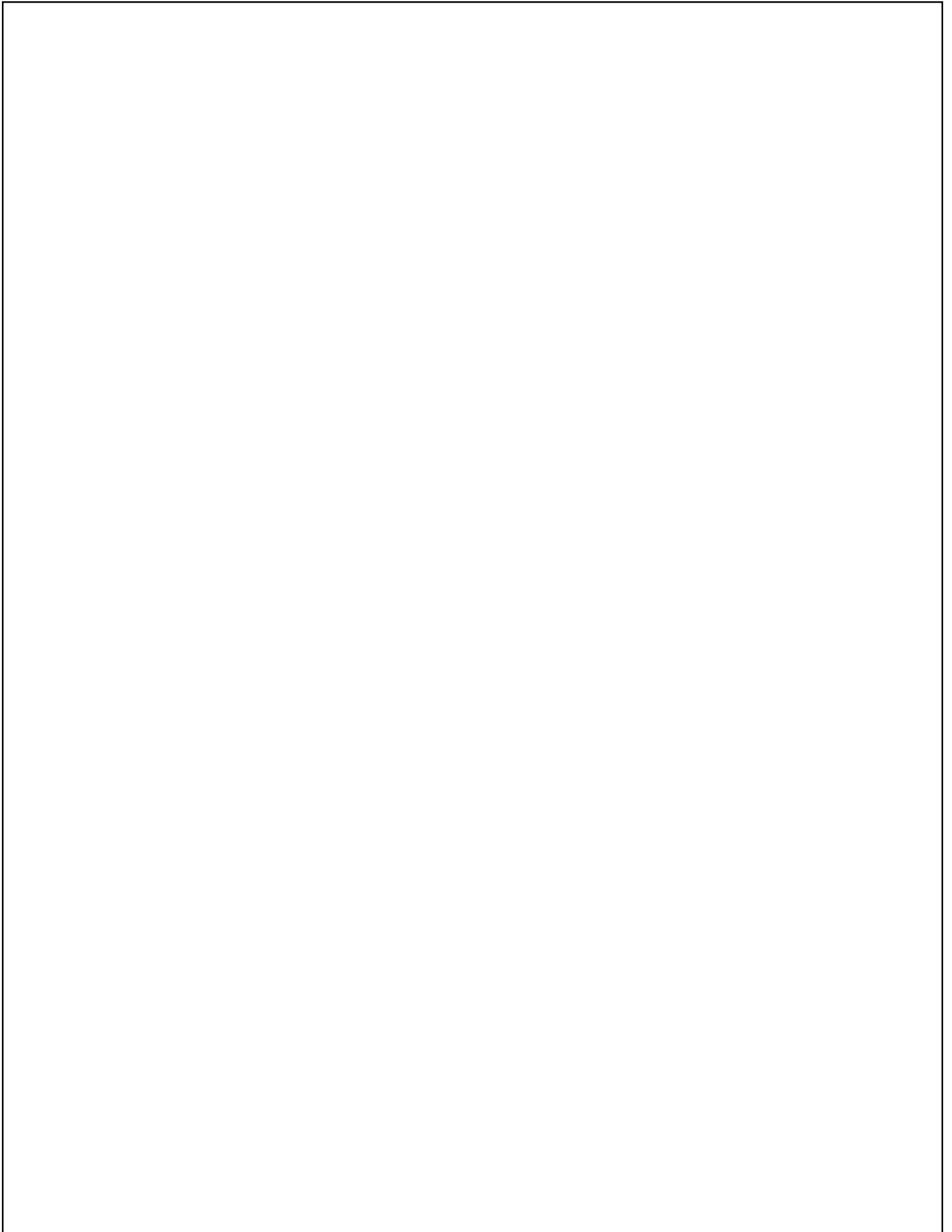
*Setting the Standard With the
World's Most Valued Grinders.*

388
MANUAL
REEL MOWER
GRINDER

This book consists of two manuals:

The OPERATORS MANUAL which contains all the information on operating and doing routine daily maintenance on this equipment.

The ASSEMBLY and SERVICE MANUAL which is used by the maintenance department to install the equipment and to do all maintenance except routine daily maintenance.



388 MANUAL REEL MOWER GRINDER

OPERATORS MANUAL



WARNING

You must thoroughly read and understand this manual before operating the equipment, paying particular attention to the Warning & Safety instructions.

SAFETY INSTRUCTIONS

Safety Awareness Symbols are inserted into this manual to alert you to possible **Safety Hazards**. Whenever you see these symbols, follow their instructions.



The **Warning Symbol** identifies special instructions or procedures which, if not correctly followed, could result in personal injury.



The **Caution Symbol** identifies special instructions or procedures which, if not strictly observed, could result in damage to or destruction of equipment.

1. **KEEP GUARDS IN PLACE** and in working order.
2. **REMOVE WRENCHES AND OTHER TOOLS.**
3. **KEEP WORK AREA CLEAN.**
4. **DON'T USE IN DANGEROUS ENVIRONMENT.** Don't use Grinder in damp or wet locations. Machine is for indoor use only. Keep work area well lit.
5. **KEEP ALL VISITORS AWAY.** All visitors should be kept a safe distance from work area.
6. **MAKE WORK AREA CHILD-PROOF** with padlocks or master switches.
7. **DON'T FORCE THE GRINDER.** It will do the job better and safer if used as specified in this manual.
8. **USE THE RIGHT TOOL.** Don't force the Grinder or an attachment to do a job for which it was not designed.
9. **WEAR PROPER APPAREL.** Do not wear loose clothing, gloves, neckties, or jewelry which may get caught in moving parts. Nonslip footwear is recommended. Wear protective hair covering to contain long hair.
10. **ALWAYS USE SAFETY GLASSES.**
11. **SECURE YOUR WORK.** Make certain that the cutting unit is securely fastened with the clamps provided before operating.
12. **DON'T OVERREACH.** Keep proper footing and balance at all times.
13. **MAINTAIN GRINDER WITH CARE.** Follow instructions in Service Manual for lubrication and preventive maintenance.
14. **DISCONNECT POWER BEFORE SERVICING,** or when changing the grinding wheel.
15. **REDUCE THE RISK OF UNINTENTIONAL STARTING.** Make sure the switch is OFF before plugging in the Grinder.
16. **USE RECOMMENDED ACCESSORIES.** Consult the manual for recommended accessories. Using improper accessories may cause risk of personal injury.
17. **CHECK DAMAGED PARTS.** A guard or other part that is damaged or will not perform its intended function should be properly repaired or replaced.
18. **NEVER LEAVE GRINDER RUNNING UNATTENDED. TURN POWER OFF.** Do not leave grinder until it comes to a complete stop.
19. **KNOW YOUR EQUIPMENT.** Read this manual carefully. Learn its application and limitations as well as specific potential hazards.
20. **KEEP ALL SAFETY DECALS CLEAN AND LEGIBLE.** If safety decals become damaged or illegible for any reason, replace immediately. Refer to replacement parts illustrations in Service Manual for the proper location and part numbers of safety decals.
21. **DO NOT OPERATE THE GRINDER WHEN UNDER THE INFLUENCE OF DRUGS, ALCOHOL, OR MEDICATION.**

SAFETY INSTRUCTIONS



IMPROPER USE OF GRINDING WHEEL MAY CAUSE BREAKAGE AND SERIOUS INJURY.

Grinding is a safe operation if the few basic rules listed below are followed. These rules are based on material contained in the ANSI B7.1 Safety Code for "Use, Care and Protection of Abrasive Wheels". For your safety, we suggest you benefit from the experience of others and carefully follow these rules.

DO

1. **DO** always **HANDLE AND STORE** wheels in a **CAREFUL** manner.
2. **DO VISUALLY INSPECT** all wheels before mounting for possible damage.
3. **DO CHECK MACHINE SPEED** against the established maximum safe operating speed marked on wheel.
4. **DO CHECK MOUNTING FLANGES** for equal and correct diameter.
5. **DO USE MOUNTING BLOTTERS** when supplied with wheels.
6. **DO** be sure **WORK REST** is properly adjusted.
7. **DO** always **USE A SAFETY GUARD COVERING** at least one-half of the grinding wheel.
8. **DO** allow **NEWLY MOUNTED WHEELS** to run at operating speed, with guard in place, for at least one minute before grinding.
9. **DO** always **WEAR SAFETY GLASSES** or some type of eye protection when grinding.

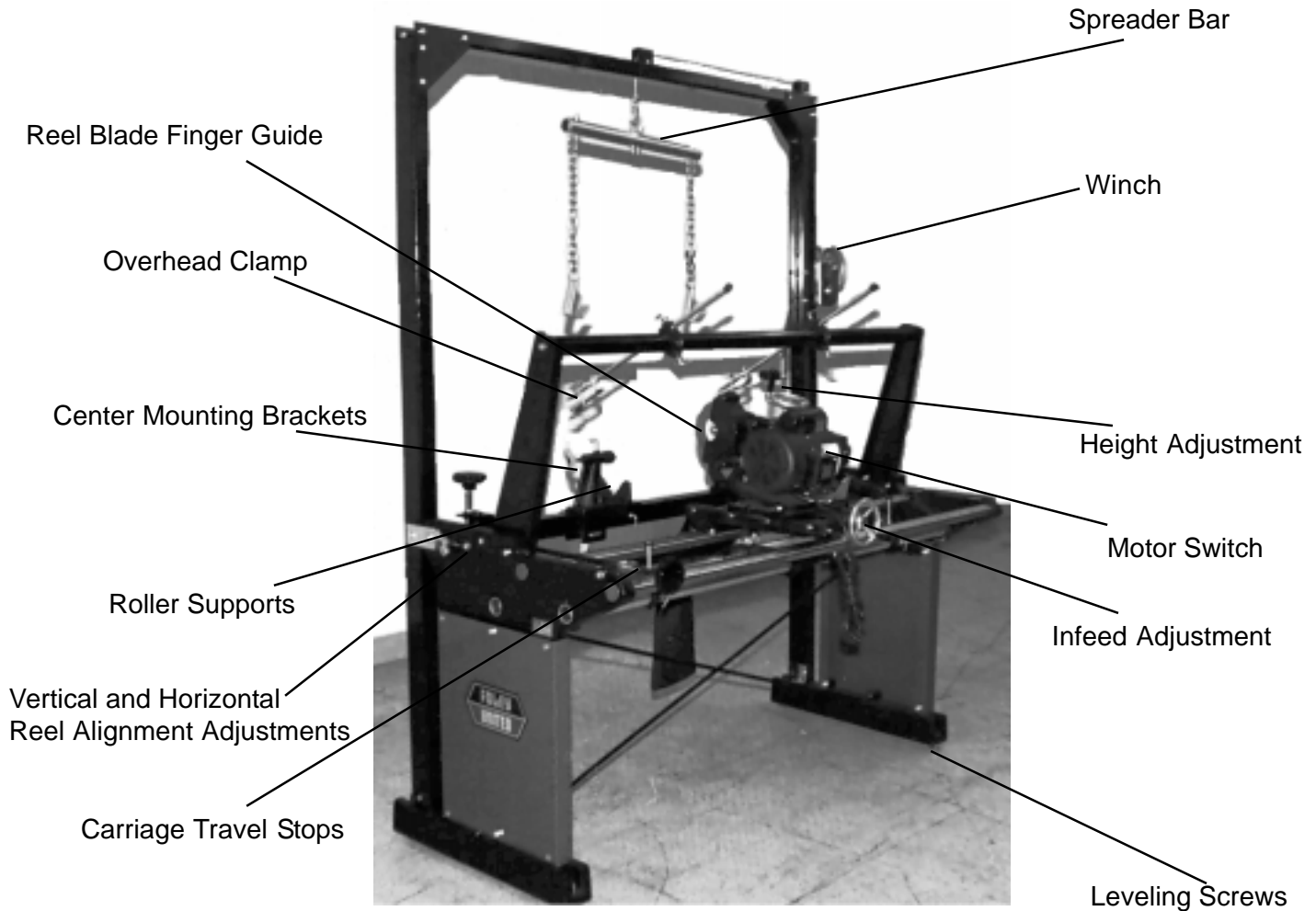
DON'T

1. **DON'T** use a cracked wheel or one that **HAS BEEN DROPPED** or has become damaged.
2. **DON'T FORCE** a wheel onto the machine **OR ALTER** the size of the mounting hole - if wheel won't fit the machine, get one that will.
3. **DON'T** ever **EXCEED MAXIMUM OPERATING SPEED** established for the wheel.
4. **DON'T** use mounting flanges on which the bearing surfaces **ARE NOT CLEAN, FLAT AND FREE OF BURRS.**
5. **DON'T TIGHTEN** the mounting nut excessively.
6. **DON'T** grind on the **SIDE OF THE WHEEL** (see Safety Code B7.2 for exception).
7. **DON'T** start the machine until the **WHEEL GUARD IS IN PLACE.**
8. **DON'T JAM** work into the wheel.
9. **DON'T STAND DIRECTLY IN FRONT** of a grinding wheel whenever a grinder is started.
10. **DON'T FORCE GRINDING** so that motor slows noticeably or work gets hot.



AVOID INHALATION OF DUST generated by grinding and cutting operations. Exposure to dust may cause respiratory ailments. Use approved NIOSH or MSHA respirators, safety glasses or face shields, and protective clothing. Provide adequate ventilation to eliminate dust, or to maintain dust level below the Threshold. Limit Value for nuisance dust as classified by OSHA.

GETTING TO KNOW YOUR GRINDER



MACHINE SPECIFICATIONS

Motor:	.75 HP 115/220 VOLT 60/50 Cycle 1 Phase
Grinding Wheels:	6" [152 mm] Diameter x 3/8" [10 mm] Wide. 24 Grit for Reels. 6" [152 mm] Diameter x 1" [25 mm] Deep Straight Cupped Wheel 60 Grit for Bedknives
Carriage Travel.	40" [102 cm]
Overall Width.	72" [183 cm]
Overall Height.	80" [203 cm]
Overall Depth.	43" [109 cm]
Weight.	395 lbs. [180 kg] (520 lbs. [235 kg] shipping weight)
Carriage Rails.	Precision Ground 1.500 [38.1 mm] Dia. Steel
Elevator.	400 lb. [180 kg] Capacity
Sound Level.	Higher than 85 DbA

OPERATING INSTRUCTIONS

This machine is intended for manual reel mower reel blade and bed knife grinding ONLY. Any use other than this may cause personal injury and void the warranty.



To assure the quality and safety of your machine and to maintain the warranty, you MUST use original equipment manufactures replacement parts and have any repair work done by a qualified professional.

ALL operators of this equipment must be thoroughly trained BEFORE operating the equipment.

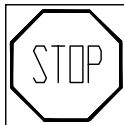
Do not use compressed air to clean grinding dust from the machine. This dust can cause personal injury as well as damage to the grinder.



Symbol for starting or running the machine. Flip the toggle switch to this side.



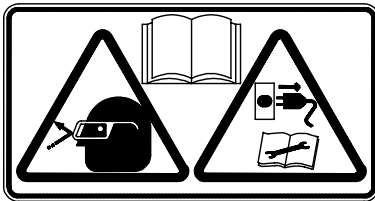
Symbol to keep visitors a safe distance away from the grinder.



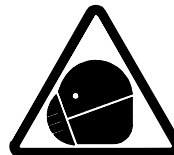
Symbol for emergency stopping the machine. Flip the toggle switch to this side.



Symbol to keep exposed gasoline or flammables away from the grinder because it operates with a large amount of sparks.



Symbols for Read operators manual, wear safety glasses and disconnect power before servicing.



Symbol that operators and people in the close proximity must wear respirators or have adequate ventilation systems.



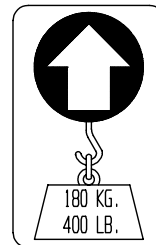
Symbol for sharp object which will cause serious injury.



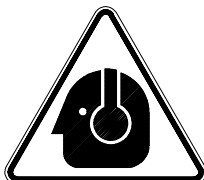
Symbol identifying a panel, cover, or area as having live electrical components within.



Symbol for caution relating to RPM of the motor and minimum safe rated RPM of the grinding wheel.



Symbol for the lift stating the maximum load is 400 lbs or 180 kg.



Symbol for hearing protection required when operating this machine

OPERATING INSTRUCTIONS

ITEMS TO INVESTIGATE ON THE CUTTING UNIT BEFORE SHARPENING:

1. Inspect cutting unit for what may be wrong with the mower other than needing sharpening.
2. Check for loose reel shaft bearings. If the bearings are worn you must install new bearings prior to grinding. Make sure reel bearings are adjusted properly so reel turns easily by hand. (See Manufacturer's Manual).
3. Inspect the bedknife and bar for damage (cracks, warping, bushing wear, excessive knife wear). Replace or repair as required. (See Manufacturer's Manual).
4. Check for cracked, broken, or worn components. Replace if found.
5. Check for loose or worn ground roller bearings. Adjust or replace if found. (See Manufacturer's Manual).

PREPARE MOWER FOR SHARPENING

It is recommended that the reel to be sharpened is thoroughly cleaned. Remove ground drive wheels and, when appropriate, remove the bed bar from the reel.

All bedknives must be ground when reels are sharpened. Inspect, adjust, and/or replace any worn or damaged bearings. Make sure reel bearings are adjusted properly so the reel turns easily by hand.



Reels ground with bearings which have wear and/or free play will not hold diameter, or straightness specifications.

OPERATING INSTRUCTIONS CONT.

GRINDING INSTRUCTIONS

Before attempting to sharpen a mowing unit, read the following instructions so that you will be more familiar with this grinder.

The reel mower cuts grass by a shearing action. Grass is supported by the bedknife and sheared off by the reel blades. Since there are five or more blades in most reels, the bedknife does five or more times the work of the reel blades.

In order for the reel and bedknife to shear grass properly, it is necessary that the cutting edges be sharp and have the proper clearances. There are two clearances to consider.

One is the clearance between the reel blades and bedknife. This is called running clearance. Too much running clearance will result in the mower skipping or not shearing grass at all; too little clearance may result in rapid wear on the cutting edges of the reel and bedknife and produce a very hard running mowing unit that requires extra torque to drive.

The second clearance is the relief ground in to the reel and bedknives. This relief yields less contact area to the bedknife which allows the cutting edges to be set very close to each other and yet not have excess drag of the cutting blade across the bedknife. See FIG. 1.

Consult the manual for your cutting unit or the manufacturer for the recommended clearances.

PREPARING THE GRINDER FOR SHARPENING A REEL MOWER

The grinding head should be checked for squareness. Place an angle gage on the grinding head pulley as shown in FIG. 2. If the head is not square, loosen the two set screws on the head support, adjust the head making certain to maintain belt tension and retighten the set screws.

Dress the grinding wheel. Use the dressing brick, included with the grinder, or optional Diamond Dresser (Order Part No. 6000560) as shown in FIG. 3. The diamond dresser should be adjusted to remove only a slight amount of material at a time, lowering it by turning it clockwise about 1/16" [1.5 mm] of a turn on each pass over the grinding wheel. Continue dressing until the grinding wheel has been dressed across its entire width.

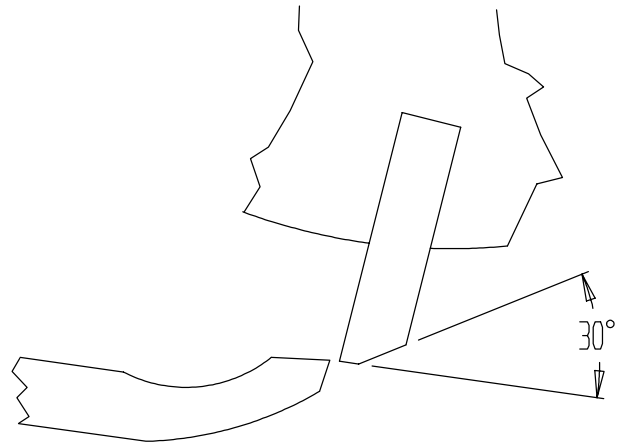


FIG. 1

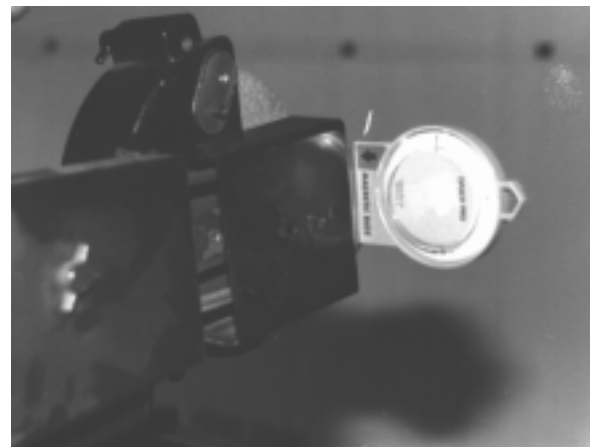


FIG. 2

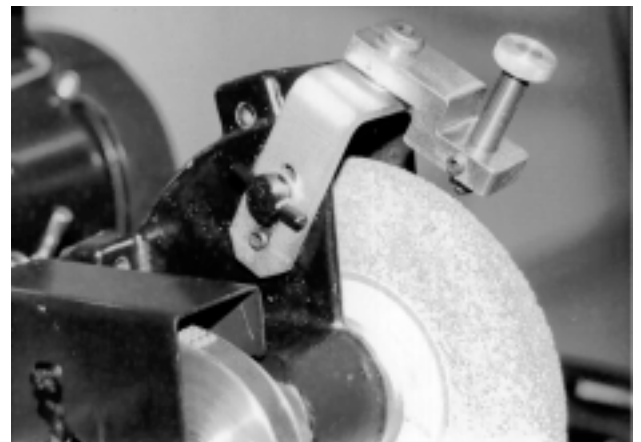


FIG. 3

OPERATING INSTRUCTIONS CONT.

CENTERS BRACKET SET UP

Determine the middle of the square tooling bar, by use of the winch cable. When mounting reels, centers will most often be used to hold the mowing unit. To mount, measure the outside distance of the mower frame. Using the center point of the square mounting bar, position the fixed centering bracket 1/2 that distance to the left side and securely fasten.

NOTE: Tighten the side locking knob first so the bracket is forced against mounting bar. Then tighten the locking screw for the bottom bracket. See FIG. 4.



Firmly tighten all locking knobs before grinding. Any looseness will adversely affect grinding quality. Knobs can be additionally tightened with an allen wrench to insure maximum locking power.

Then place the adjustable centering bracket that distance plus 1/4" [6 mm] on the right side of the mounting bar and loosely fasten. It may be necessary to move this bracket when lifting reel into place even though it can be adjusted. The adjusting cone should be retracted as far as possible as it will be easier to secure reels when in place. See FIG. 5.



FIG. 4

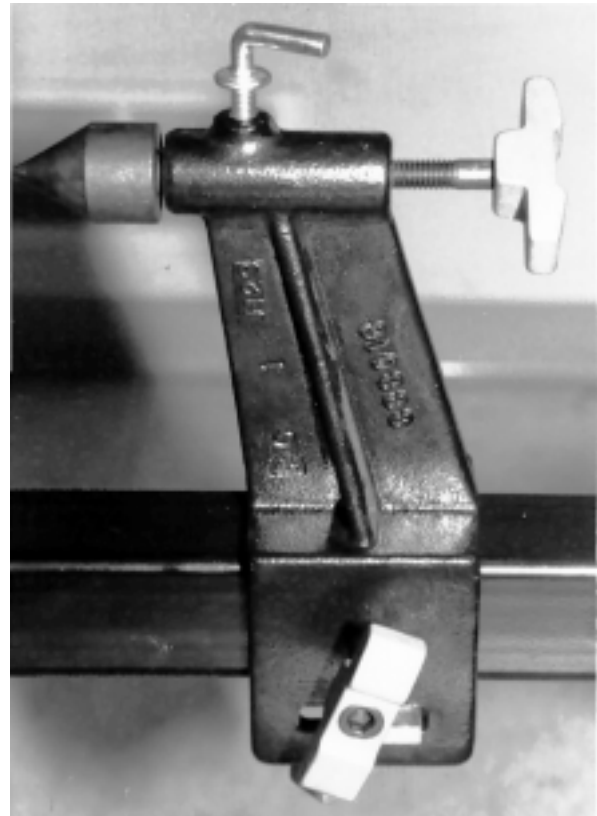


FIG. 5

OPERATING INSTRUCTIONS CONT.

LIFTING REEL INTO POSITION WHEN USING CENTER BRACKETS

Position the reel behind the grinder on the floor so the front of the mower faces towards the front of the machine. Hook the reel elevator spreader bar onto the reel. The hooks on the bar should be spaced evenly along the mower, so they do not slip or slide as the mower is being raised. See FIG. 6.



Read separate directions on winch operations and maintenance that are included in the manual packet.

Do not overload the winch capacity. Winch capacity is a maximum of 400 lbs.

NOTE: The winch has a spring loaded handle that automatically actuates a brake when the handle is released. The winch clicks as it is being raised. Slowly raise the reel into position by cranking the winch handle with the left hand and steadying the reel with the right hand. Your right arm should be fully extended during the lifting operation. See FIG. 7.



The operator should be positioned away from the reel, guiding the reel at arms length. Do not stand underneath the reel as it is being raised. See FIG. 7.

Insert a predetermined hole in the reel frame onto the fixed center. While holding the reel firmly against the fixed center, raise or lower the reel so the adjustable centering bracket can be moved and the adjustable center inserted into a corresponding hole in the opposite side of the reel frame. Now, very firmly, tighten both locking knobs on the adjustable bracket and then tighten the adjustable center into the reel and secure with the adjustable center locking knob. See FIG. 8.



Firmly tighten all locking knobs before grinding. Any looseness will adversely affect grinding quality. Knobs can be additionally tightened with an allen wrench to insure maximum power.

The adjustable center must be firmly tightened into the reel, but excessive force can distort the reel frame causing binding and a poor quality grind.

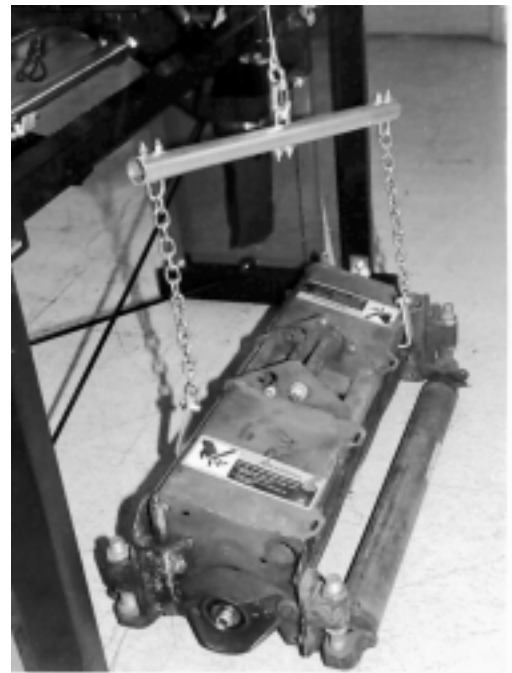


FIG. 6



FIG. 7

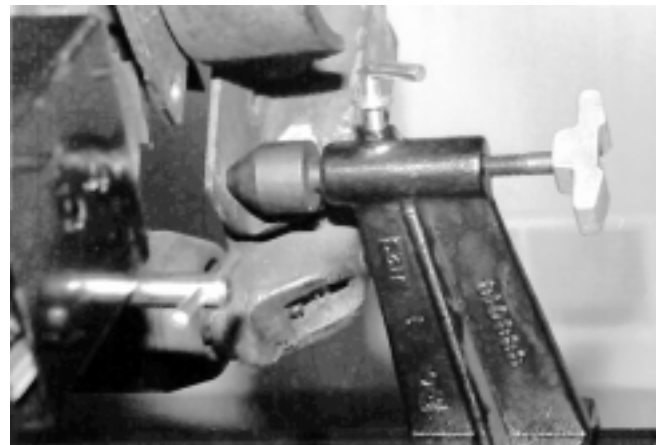


FIG. 8

OPERATING INSTRUCTIONS CONT.

INITIAL SET UP OF ROLLER SUPPORTS

Some reels cannot effectively be mounted on centers as described earlier. A pair of Roller Supports have been provided for these applications. Place the roller supports on the top side of the tooling bar and position them approximately 2" [51 mm] from each end of the reel ground roller, centered to the cable. The roller supports have an offset "V" so they can be positioned with the lock handle to the front or rear depending on the reel requirement. The mowing unit back roller is then placed in the "V" of the roller support. See FIG. 9.

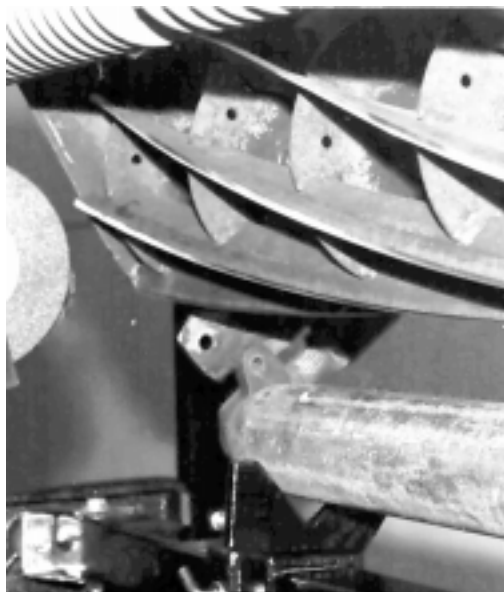


FIG. 9



CAUTION: Firmly tighten all locking knobs before grinding. Any looseness will adversely affect grinding quality.

ATTACHING THE OVERHEAD CLAMPING ARMS

Loosen the two (2) screw handles on each overhead clamp and move them to where the overhead clamp rods with clamping lips can be attached to the reel. This can be a mounting bolt on the reel or a reel cross bar. Tighten the clamping lips to the mowing unit on both sides, then securely tighten the (2) locking handles on the right side overhead clamp. Tighten the overhead housing to the large cross bar on the left side, but do not tighten the slide bar clamp until reel has been aligned. See FIG. 10.

Clamping lips to reel Slide bar clamp

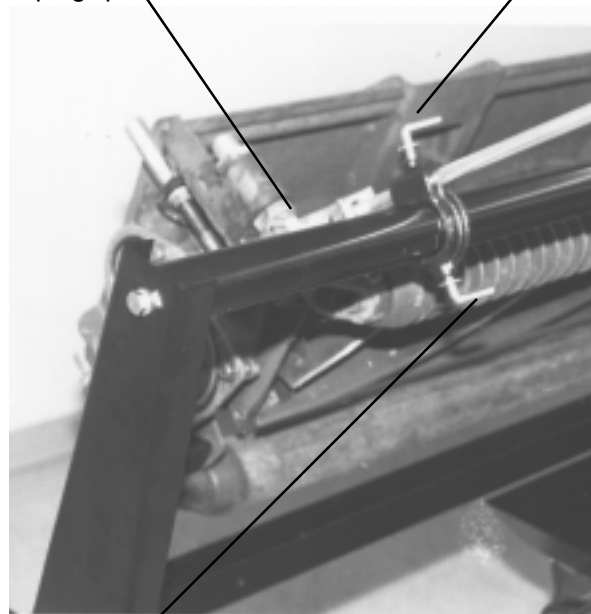


FIG. 10



Do not tighten the left side slide bar clamp where rods are inserted into the lower part of the clamp until reel has been aligned. See FIG. 10.

Firmly tighten all locking knobs before grinding. Any looseness will adversely affect grinding quality.

Clamp to large tube

In most cases, it is recommended to leave the spreader bar and chains hooked up to the reel as an added safety precaution. The cable should be winched tight to insure the chain, hook and spreader bar will not become engaged with the reel during sharpening.

REMOVING SPREADER BAR FROM REEL

If the hooks will not clear the reel, then remove the spreader bar and hooks from the reel. Place hooks over the top channel on the elevator and crank up excessive slack. See FIG. 11.



FIG. 11

OPERATING INSTRUCTIONS CONT.

ALIGNMENT OF MOWER IN GRINDER

It is important that the reel center shaft is aligned with the grinding head traverse rails as accurately as possible.

Before starting the alignment, the lock handles on the left overhead support slide bar must be loose, so that support can float free while alignment is being made. See CAUTION note on page 10 and FIG. 10.

1. Loosen the vertical and horizontal lock knobs on the vertical and horizontal adjusters on the left side of the tooling bar. Loosen the Vertical Stop Lock. See FIG. 12.
2. Set up alignment gauge as in FIG. 14. Vertical Lock Knob

Adjust the vertical alignment as follows:

3. With carriage to right end of reel, loosen thumb screw on stop collar and slide the alignment rod toward reel shaft so the rod is over reel shaft. Then adjust the rod downward by vertical adjustment on carriage, until it just touches the reel center shaft. See FIG. 14.
4. Notice the feel of the alignment rod against the reel shaft (rod snug, slight amount of drag, etc.); then slide the rod back so end of rod clears the reel, move carriage to left end of reel; then slide rod over reel shaft to check the height of the shaft.
5. Adjust the vertical adjusting screw until both ends of reel are the same height. Note: As you adjust the tooling bar on the left side, note that both the left side of the reel and the right side of the reel are moving. It will take several checks on each side to get the alignment correct.



For proper adjustment it is recommended that you are raising the rear tooling bar with the adjusting knob for vertical adjustment to insure no slack in the system.

Lock the vertical lock knob and the vertical stop lock when vertical adjustment is completed.

NOTE: Some mowing units will require that the alignment rod is located on the bottom side of the reel center shaft rather than the top side as described above. See FIG. 15.

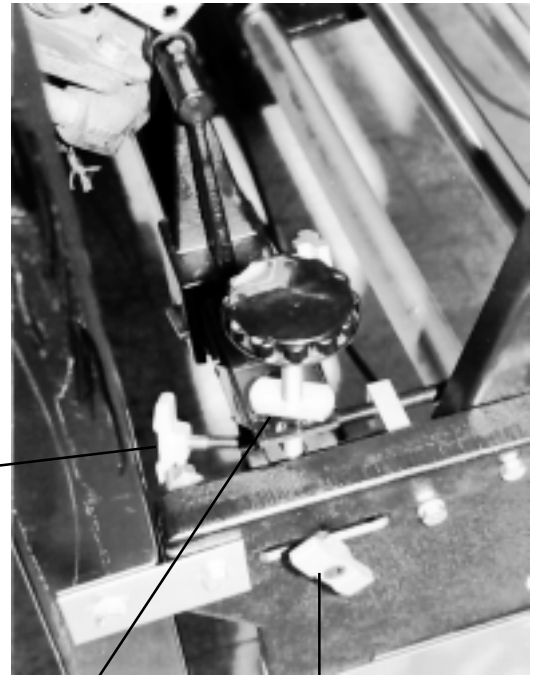


FIG. 12

Vertical Stop Lock Horizontal Lock Knob

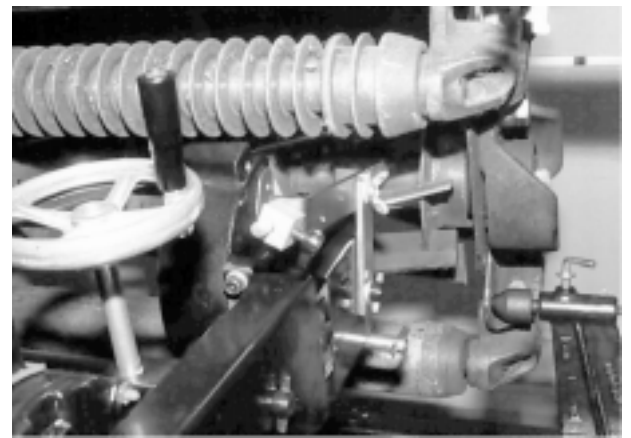


FIG. 14

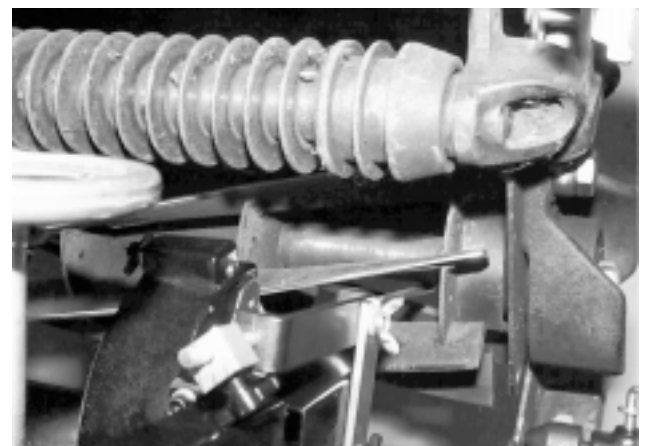


FIG. 15

OPERATING INSTRUCTIONS CONT.

Adjust the horizontal alignment as follows:

6. Lower gauge so the alignment rod points to the center of the reel shaft and move the carriage to the right end of the reel. Slide the alignment rod in until the end is tight against the reel center shaft about 1" [25 mm] from the outside spider. Line up the stop block with back side of the yoke and tighten the stop block screw. See FIG. 16.
7. Slide the alignment rod back to clear the reel and move carriage to left end of reel and slide rod in to touch shaft. **DO NOT** loosen the stop block screw. Notice the distance between the stop block collar and the yoke as well as the rod to reel center shaft. If not lined up as on the other end of reel, adjust horizontal knob on machine until both sides are identical. Again, it will take several checks on each end to get correct alignment.



For proper adjustment it is recommended that you are pushing or moving the rear tool bar rearward with the adjusting knob for horizontal adjustment to insure no slack in the system.

Tighten the horizontal lock knob after horizontal alignment is completed. Lock the knob for left side overhead rod. Double check the tightness of all lock handles.

NOTE: An optional dial indicator alignment gage is available. Order part No. 3889560. See FIG. 17. Instructions for use of this optional alignment gage is included with the gage.



FIG. 16

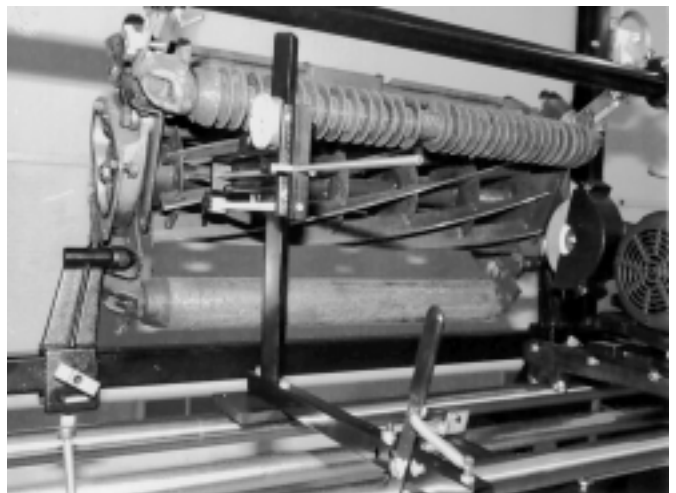


FIG. 17

OPERATING INSTRUCTIONS CONT.

SET REEL BLADE RELIEF ANGLE

The relief angle is determined by the relative position of the reel blade, relief finger and grinding wheel during grinding. As shown in FIG. 18. Since the guide finger is fixed in relation to the grinding wheel, lowering the grinding wheel will increase the relief angle on the reel blade, and raising the grinding wheel will decrease the relief angle. Check with reel manufacturer for the correct angle for each reel. The position shown in FIG. 18, 30 degree relief angle, is the average of the industry and is recommended when you cannot get the correct reel manufacturers specification.

By turning the handwheel on the motor shaft you can check your set up by rubbing the grinding wheel on the reel blade. The shiny area of contact should show toward the back side of the reel away from the cutting edge. See FIG. 18A. The vertical grinding wheel adjuster has a lock knob, which must be loosened before adjustments and tightened after adjustment. See FIG. 19. The horizontal infeed adjustment will also require adjustments to achieve proper reel blade, relief finger and grinding wheel position.

Because of blade spacing, some reels cannot be ground to the 30 degree angle. It is recommended to use a used grinding wheel with approximately 3.00" [76 mm] dia. for close space reel blades.

CHECKING FOR REEL TAPER

Check to see if the reel blades have previously been ground or the reel has been adjusted in a true cylinder around the reel shaft.

Move the grinding wheel into the blade so that it just touches lightly, and then back off a few thousandths. Hold the blade in contact with the reel guide finger with the grinding motor **OFF**, and move the grinding head assembly across the length of the blade. If the blades have been poorly sharpened previously or have been misadjusted, and are not true with the reel shaft it may require quite heavy grinding on one end of the blades to bring them to a true cylinder.

You may wish to correct this condition over several sharpenings. If so, readjust the horizontal reel alignment using the grinding wheel as a guide. Set the alignment to take out some part of the taper.

If the taper is severe enough that the guide finger will not stay on the blade, it may be necessary to O.D. grind the reel to remove some of the taper prior to relief grinding. To O.D. grind, set the reel to guide finger to wheel relationship as shown in FIG. 20.

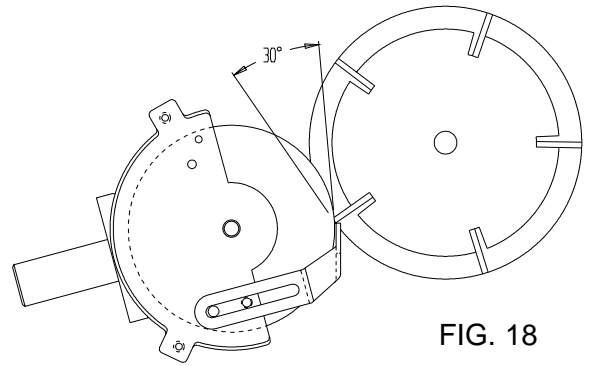


FIG. 18

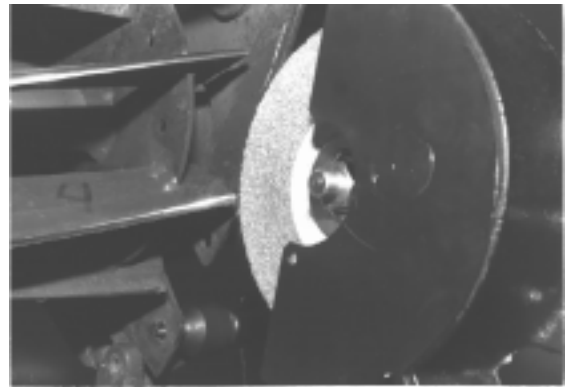
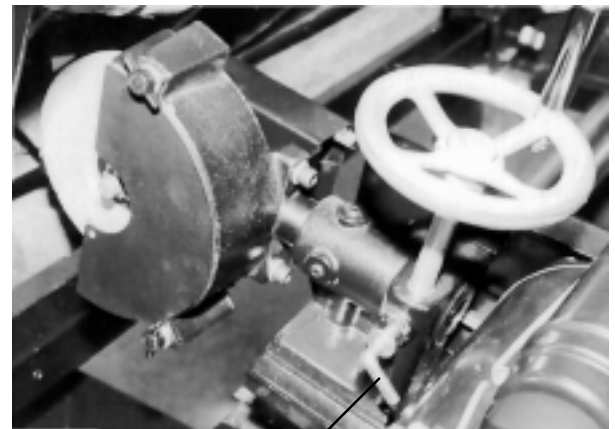


FIG. 18A



Lock Knob

FIG. 19

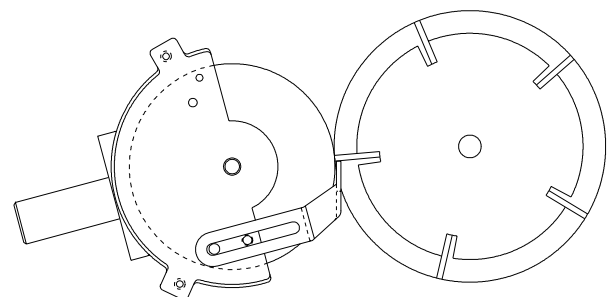


FIG. 20

OPERATING INSTRUCTIONS CONT.

MARKING BLADES

Mark the reel blades with a crayon or felt tipped marker—1,2,3,4,5 etc.

SET TRAVEL STOPS

Run the grinding wheel off each end of the blade and set the carriage stops. Set the left carriage stop so the grinding wheel comes off the blade, but it does not come off the guide finger. Set the right carriage stop so the grinding wheel comes off the blade and the blade clears the finger at least 1/8" [3 mm] for blade indexing. Make certain that the grinding wheel will not contact the end frames of the mowing unit. See FIG. 21.



Travel Stop

FIG. 21

OPERATING INSTRUCTIONS CONT.

GRINDING THE REEL

A. Check to see if your mowing unit is a normal or reverse helix. NOTE: As you look into the guide finger in FIG. 22 it shows the normal reel helix. The high point of the finger guide is on the right hand side of the grinding wheel. See FIG. 23 for reverse helix. Most mowing units are normal helix.



The high point of the guide finger (#) must always be at the corner of the grinding wheel (#) that is making contact with the reel. (See FIG. 22 and 23)

NORMAL HELIX

For a NORMAL HELIX reel, the grinding wheel should be dressed to match the angle of the reel blade. It is recommended that a slightly larger angle is dressed on the wheel so the right side of the wheel is contacting the blade prior to the left side as shown. The grinding wheel will then wear to a match.

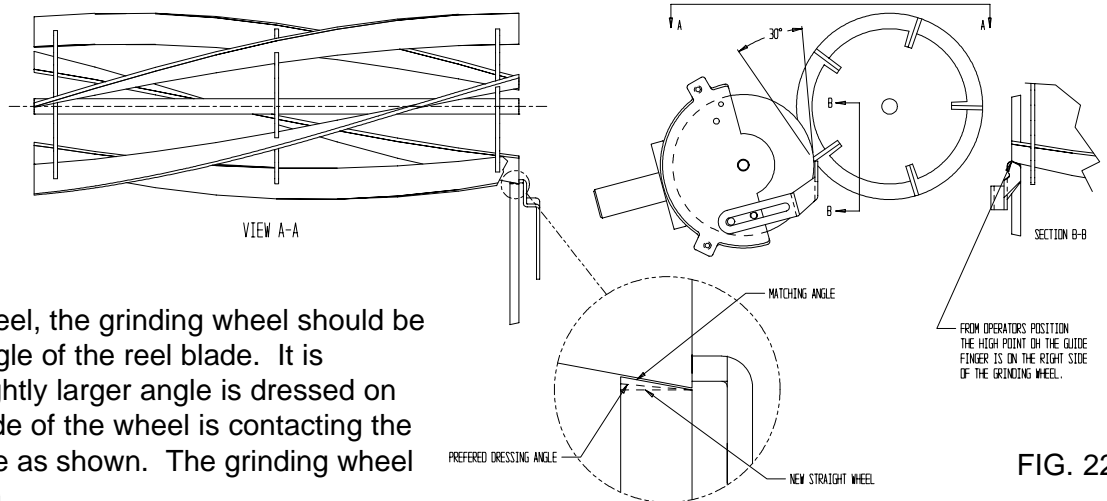


FIG. 22



If you do not dress the grinding wheel so the right side contacts first you may not relief grind part of the last 3/8" [10 mm] of the reel blade.

NOTE: The square faced wheel from the factory can be used for normal helix reels with no dressing.

REVERSE HELIX

For a REVERSE HELIX reel, the grinding wheel should be dressed to match the angle of the reel blade. It is recommended that a slightly larger angle is dressed on the wheel so the right side of the wheel is contacting the blade prior to the left side as shown. The grinding wheel will then wear to a match.

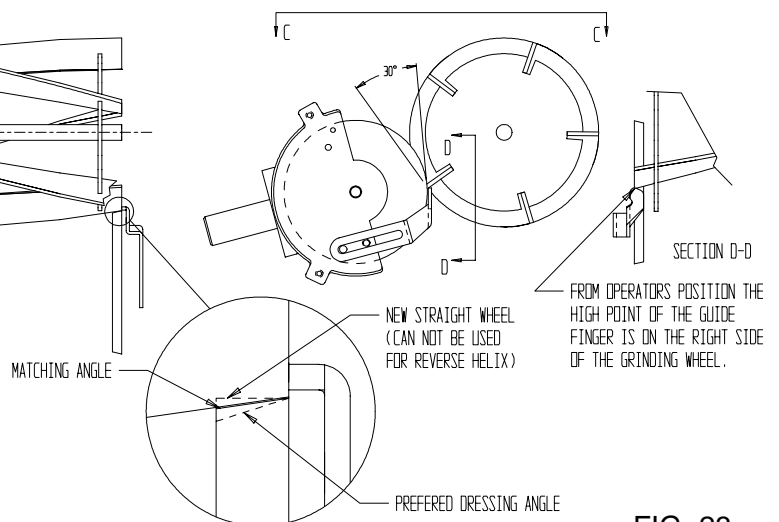


FIG. 23



If you do not dress the grinding wheel so the right side contacts first you may not relief grind part of the last 3/8" [10 mm] of the blade.

OPERATING INSTRUCTIONS CONT.

- B.** It is recommended that you practice indexing the blades for relief grinding prior to actually grinding them. Do this by backing the grinding wheel away from blade so that virtually no contact is made with the blade that is resting on the guide finger. Now, with the grinding wheel **NOT** turning, manually traverse at a uniform speed from right to left on blade 1. On the return stroke, always come back on the same blade. After traversing down and returning on a blade, relief grinding requires the operator to manually index to the next blade. This is a critical operation and should be well practiced prior to grinding. When on the practice run you have to hold the reel down to the finger on the return stroke.

SEE GRINDING WHEEL WARNINGS ON PAGE 3 BEFORE GRINDING.

THE FLANGE AND NUT ON A GRINDING WHEEL SHOULD BE TIGHTENED TO 5 FT.LBS. [.7 KGM]. OVERTIGHTENING CAN CAUSE WHEEL BREAKAGE. REPLACE ALL CRACKED WHEELS IMMEDIATELY. ALWAYS USE GUARDS AND EYE SHIELDS.



USE ONLY FLANGES FURNISHED WITH THE GRINDER. THE WHEEL GUARD IS ALWAYS TO BE MOUNTED TO COMPLY WITH OSHA REGULATIONS AND FOR SAFE OPERATIONS.

- C.** Turn on the motor and grind across blade #1. The grinding should be done with light to moderate cuts as heavy grinding pressure will result in excessive heating of the blades. Also, the carriage should be traversed manually in **smooth** and **uniform speed** passes across the blade and without stopping, holding the handle. See FIG. 24. Hold the reel to the guide finger with your left hand and pull the grinding head assembly with your right hand. As soon as the grinding wheel contacts the reel, remove your left hand. The guide finger will keep the blade in place as the grinding head assembly is traversed across the reel. When it reaches the left side of the reel, the reel blade comes fully off the grinding wheel and partially off the guide finger. The reel blade will automatically pick up the same blade on the return stroke. The blade will be held to the finger in both directions by the rotation of the grinding wheel driving the blade downward against the finger. When you reach the right end of the blade let the carriage come off the blade and gently touch against the travel stop.

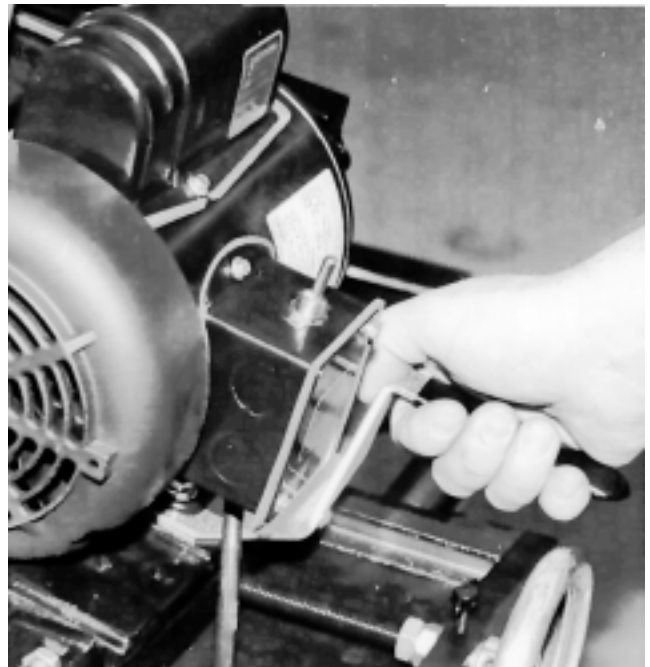
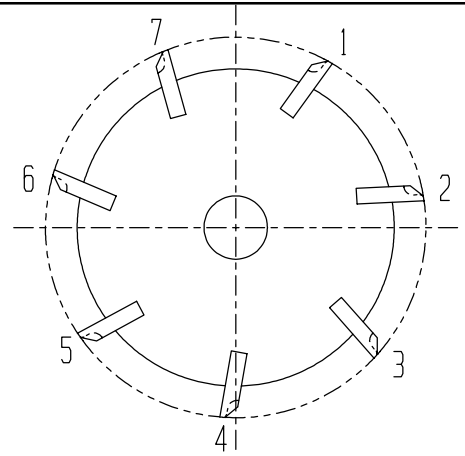


FIG. 24

OPERATING INSTRUCTIONS CONT.

D. Next manually rotate to blade #2 and grind blade #2 and continue to grind all of the blades without changing the grinding wheel setting. If you have brought all of the blades to a sharp edge, advance the grinding wheel slightly and regrind the blades, in reverse order-- starting with the highest blade number and going down. Example: #5 then 4,3,2,1. The reason for this is to get a better finish and to compensate for grinding wheel wear on the original grind. If the blade is not ground to a sharp edge, adjust the horizontal infeed wheel and grind another cycle. Grind the blades 2-3-4-5-1 as an example on the second cycle. Listed on FIG. 25 are two optional methods to stagger reel blades during grinding. The reel must be ground until you achieve a sharp edge. See FIG. 26. Again, always reverse order with a slight infeed after achieving a sharp edge.



GRINDING SEQUENCE

1	3	5	7	2	4	6
2	4	6	1	3	5	7
3	5	7	2	4	6	1
OR						
1	2	3	4	5	6	7
2	3	4	5	6	7	1
3	4	5	6	7	1	2

FIG. 25



It is very important to a quality grind that a staggered grinding method is used.

IT IS NECESSARY TO MANUALLY POSITION THE REEL BLADE ON THE GUIDE FINGER. IF YOU OVER-INDEX AND MISS THE FINGER THE GRINDING WHEEL COULD BE JAMMED BETWEEN TWO BLADES. IF YOU UNDER-INDEX, THE GRINDING WHEEL WILL BE JAMMED AGAINST THE END OF THE BLADE YOU ARE TRYING TO GRIND.



BECAUSE YOU ARE MANUALLY TRAVERSING, BACKING UP AND RESTARTING WITH THE REEL BLADE ON THE GUIDE FINGER IS VERY EASY.

EXTREME CARE MUST BE TAKEN IN LEARNING THIS PROCEDURE AS SERIOUS PERSONAL INJURY COULD OCCUR IF THE OPERATOR CONTACTS THE GRINDING WHEEL OR IS CAUGHT IN A GRINDING WHEEL TO REEL JAM. PRACTICE UNTIL YOU ARE SATISFIED WITH YOUR CAPABILITY.

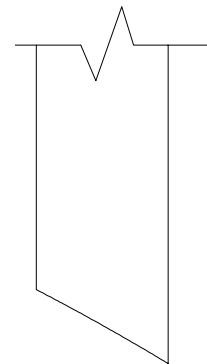


FIG. 26

OPERATING INSTRUCTIONS CONT.

LAPPING

After relief grinding to a point, the reel mowers must be back lapped (using the Model 365 Back Lapper) to assure a perfect match between the reel and the bedknife. Follow the procedures as explained in the Back Lapper Manual. See FIG. 27.

GRINDING THE REEL WHEN REMOVED FROM THE MOWING UNIT

When grinding a reel which has been removed from the mounting unit, the reel is mounted on "V" shaped reel holders and ground in the same manner as when it is in the mowing frame. See FIG. 28A and FIG 28B. The Reel Holder Attachment is offered as OPTIONAL under Part No. 3880932.

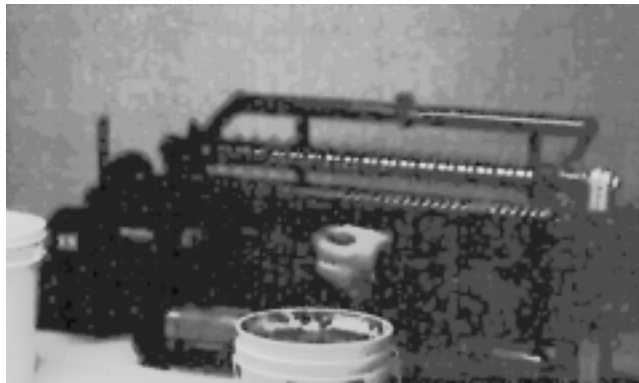


FIG. 27



FIG. 28A



FIG. 28B

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OPERATING INSTRUCTIONS CONT.

GRINDING THE BEDKNIFE WHEN IT IS REMOVED FROM THE MOWER

The bedknife has two faces, the top face and the front face. The top and front face angles will vary depending on the manufacturer. There is usually a 5-7 degree clearance angle on the top face and a 10-30 degree clearance angle on the front face angle. See FIG. 29. New bedknives should be ground before being put into use. The 388 bedknife attachment will be sharpening the top face angle **ONLY**.



CONSULT YOUR MOWING UNIT MANUAL OR CONTACT THE MOWING UNIT MANUFACTURER FOR THE CORRECT ANGLES FOR YOUR BEDKNIFE.

MOUNT THE GRINDING WHEEL

Unlock the grinding head locking set screws. Rotate the grinding head counter clockwise approximately 91 degrees. The head must be rotated so the grinding wheel is .015" [.4 mm] higher on the right side than the left side. The left side of the grinding wheel will do the grinding. See FIG. 30. Retighten the grinding head locking set screws. Mount the grinding wheel as shown in FIG. 31.

SEE GRINDING WHEEL WARNINGS ON PAGE 3 BEFORE GRINDING.

THE FLANGE AND NUT ON A GRINDING WHEEL SHOULD BE TIGHTENED TO 5 FT.LBS. [.7 KGM] OVERTIGHTENING CAN CAUSE WHEEL BREAKAGE. REPLACE ALL CRACKED WHEELS IMMEDIATELY. ALWAYS USE GUARDS AND EYE SHIELDS. USE ONLY FLANGES FURNISHED WITH THE GRINDER.

THE WHEEL GUARD IS ALWAYS TO BE MOUNTED TO COMPLY WITH OSHA REGULATIONS AND FOR SAFE OPERATIONS.

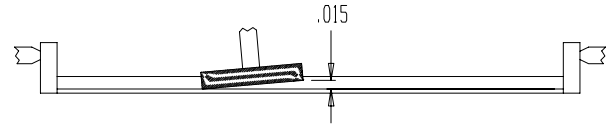


FIG. 29

FIG. 30

Locking Setscrews

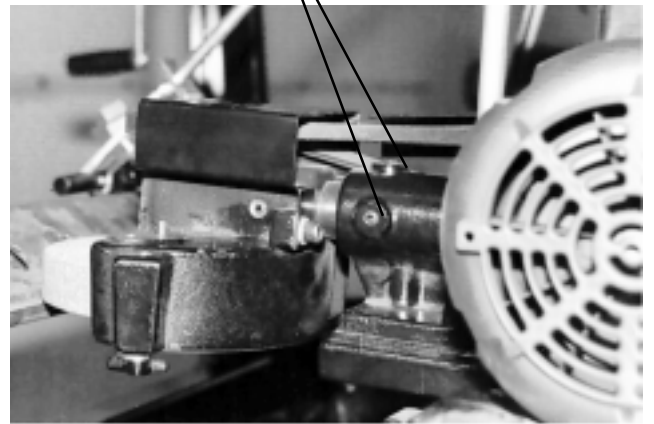


FIG. 31

OPERATING INSTRUCTIONS CONT.

CLEAN THE GRINDING WHEEL

The grinding wheel will become loaded during operation. Periodic light passes with a dressing stick held flat against wheel will maintain the dressed surface and clean the wheel.



WARNING: USE ONLY FLARED CUP OR STRAIGHT CUP TYPE GRINDING WHEELS. ALWAYS GRIND ON THE FACE.

INSPECT THE BEDKNIFE

Inspect the bedknife and bar for damage (cracks, warping, bushing wear, excessive knife wear). Replace or repair as required. (See Manufacturer's Manual.)

MOUNT THE BEDKNIFE

1. Set the fixed center 4" [100 mm] from right hand side frame, and lock the side and bottom. See FIG. 32.
2. Set the adjustable center on the left side with the adjustable center retracted and locks snug only.
3. Mount the bedknife between the two centers.
4. Move the adjustable center assembly into position on the tooling bar and lock the side and bottom. Turn the adjustment knob on the adjustable center until the bedknife is firmly, but not excessively mounted between the centers. Tighten the lock handle. See FIG 33.

THE ADJUSTABLE CENTER LOCKS MUST BE SECURELY TIGHTENED AND THE FIXED AND ADJUSTABLE CENTER MUST BE SECURELY TIGHTENED TO THE SUPPORT BAR. ANY LOOSENESS WILL ADVERSELY AFFECT GRIND QUALITY.



THE ADJUSTABLE CENTER MUST BE FIRMLY TIGHTENED INTO THE BEDKNIFE, BUT EXCESSIVE FORCE CAN DISTORT THE BED BAR CAUSING DISTORTION AND A POOR QUALITY GRIND.

ADJUST THE BEDKNIFE SUPPORT BAR & LOCK IN PLACE

Install the bed bar "C" clamp near either end of the bed bar and lock in place with one overhead mounting bars. Set the bedknife face angle to approximately 15-20 degrees. See FIG 34A and FIG 34B.

NOTE: You may have to increase or decrease the suggested 15-20 degree angle for some bedknife top faces.

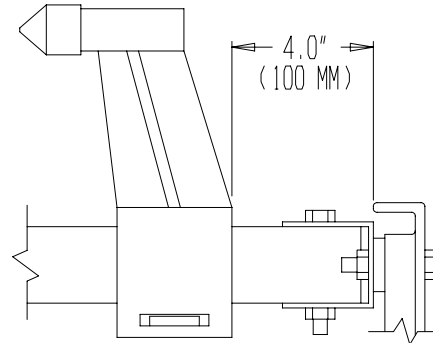
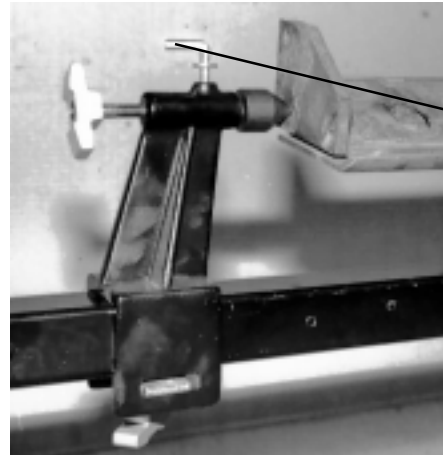


FIG. 32



Lock Handle

FIG. 33

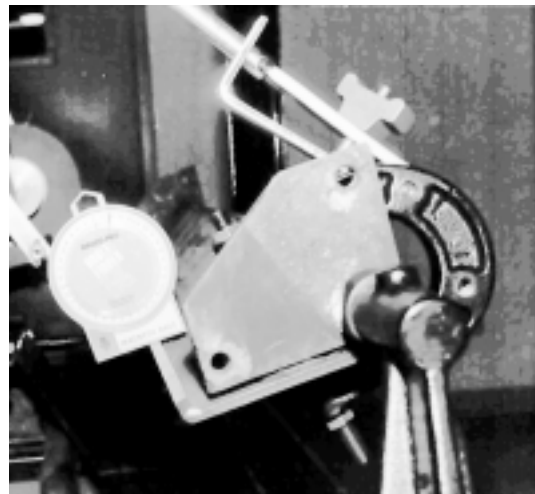


FIG. 34A

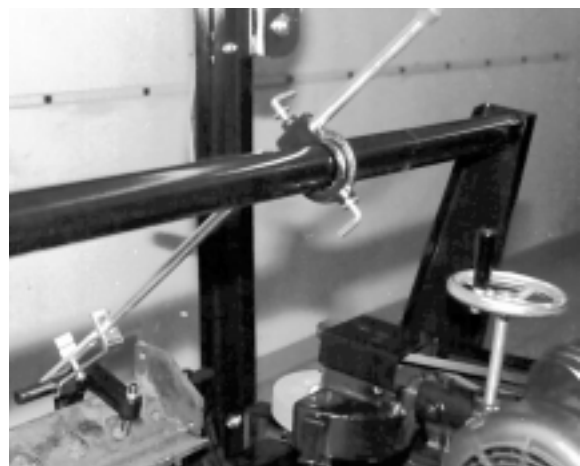


FIG. 34B

OPERATING INSTRUCTIONS CONT.

BEDKNIFE ALIGNMENT

Before grinding, the bedknife surface must be aligned to the grinding wheel travel. This is accomplished by adjusting the vertical and horizontal handwheels see FIG. 35 in conjunction with the alignment fixture see FIG. 36 using the same procedures for reel alignment found earlier in this manual.

Alignment is begun by placing alignment rod over the two (2) centers as shown in FIG. 36 and adjusting vertically.

Alignment is completed by placing alignment rod against the front side of each center as shown in FIG. 37 and adjusting horizontally.

MATCH GRINDING WHEEL TO BEDKNIFE SURFACE

Handcrank the vertical and horizontal motorhead adjustment knobs until grinding wheel roughly matches the face of the bedknife, until it just covers the surface to be ground and the inside of the grinding wheel rim is extended over the bedknife top surface being ground by 1/2" [13 mm]. See FIG. 38. Match the grinding wheel face to the bedknife angle. Both the grinding head and bedknife center support will have to be adjusted to match angles. Hand rotate the grinding wheel to scratch the bedknife top face if a more exact angle is required.

Set the travel limits so that the grinding wheel will be able to travel the complete length of the bedknife and beyond, without grinding into the centers on each end. Watch the grinding head as you take several passes to ensure that the grinding wheel is traveling the complete length of the bedknife but not touching either center on each end.

When satisfied with the grinding head travel, turn on the grinding wheel, crank the vertical feed adjustment handwheel down until the grinding wheel is lightly removing metal from the bedknife. It is recommended to take off approximately .001" [.03 mm] per pass. Grind the bedknife with **VERY UNIFORM** traverse speed until the grinding process is done. When you are satisfied with the grind, let the bedknife cool completely. Infeed the vertical grinding head for maximum .001" [.03 mm] stock removal in the final passes and then traverse for grinding wheel spark out. For sparking out in the grinding process, always traverse the grinding passes with no grinding head infeed. Traverse at a slow speed for final grinding sparkout. Watch the sparks grinding pattern for the full length of grind. The sparks should look equal for the full length.

FIG. 35

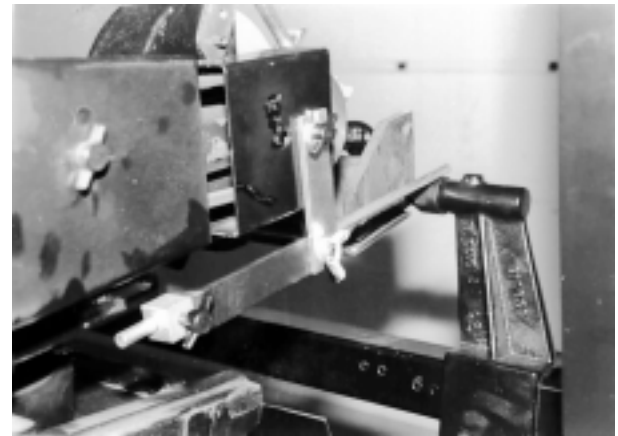
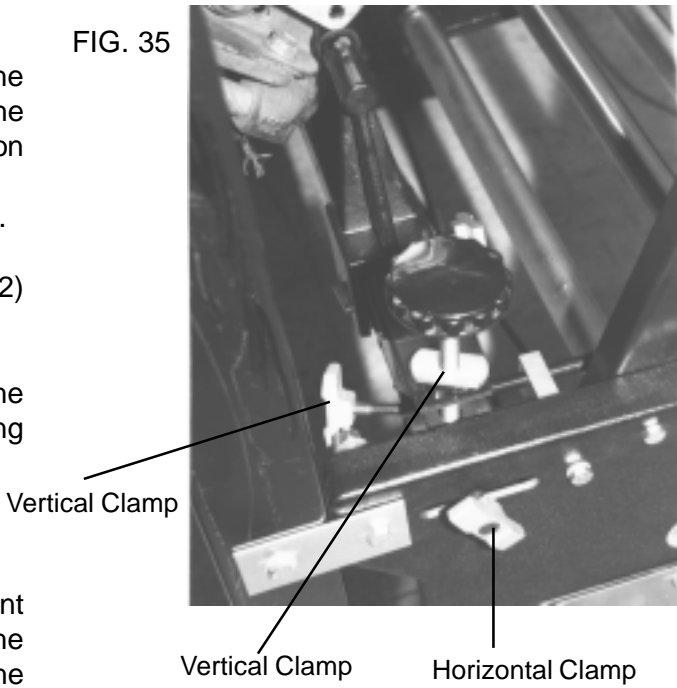


FIG. 36

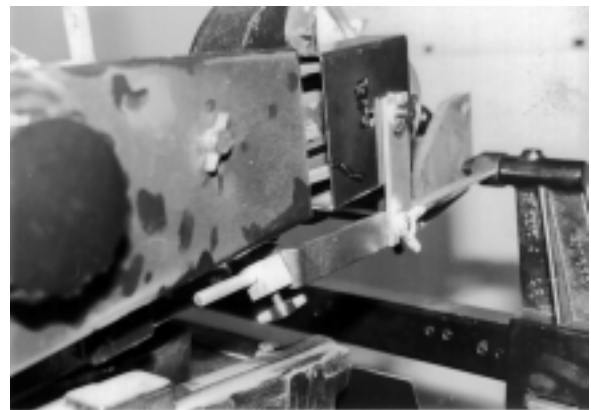


FIG. 37

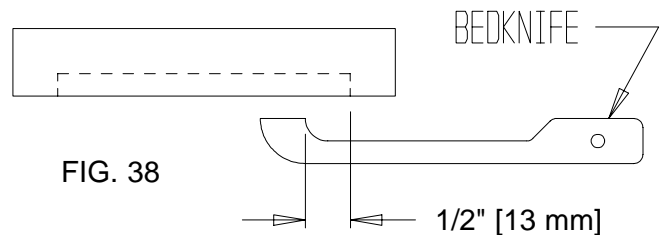


FIG. 38

OPERATING INSTRUCTIONS CONT.

USING A FLARE CUP WHEEL FOR ADDED CLEARANCE

The shape of some bedknives requires using a flare-cup grinding wheel to clear the end supports of the bedknife. See FIG. 39.

The flare-cup wheel is available as an option in a 6" [152 mm] diameter version. Order part no. 3700067. For most applications, the 6" [152 mm] straight cup wheel (provided as standard equipment) is used.

MODEL 3840553 TORO BEDKNIFE MOUNTING KIT

Several Toro mowing units use pivot slugs on the bedknives and have no centering holes when the bedknives are removed from the mower.

OPTIONAL Kit. No. 3840553 provides slugs with centers and holding clamps to allow accurate grinding of these bedknives. See FIG. 40.

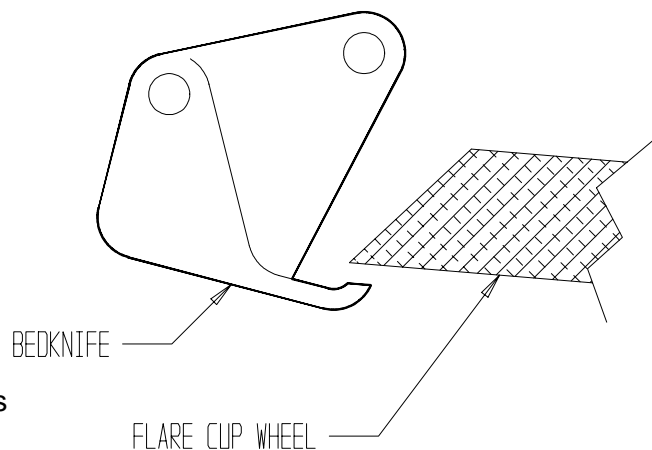


FIG. 39



FIG. 40

DAILY MAINTENANCE

On a daily basis, clean the grinder by wiping it down.

On a daily basis, inspect the grinder for loose fasteners or components and tighten.

Contact your company's Maintenance Department if damaged or defective parts are found.



**DO NOT USE COMPRESSED
AIR TO CLEAN GRINDING DUST
FROM THE GRINDER.**

