FOLEY UNITED

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

ACCU-600
SPIN / RELIEF
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 maintainence department to install the equipment and to do all maintenance except routine daily maintenance.

ACCU-600
SPIN / RELIEF
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.

6007951 (7-02)

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.** Wear no 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 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.

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

We are committed to:

Providing superior customer support, training, and service.

Manufacturing the highest quality products at an unequaled value.

Setting the industry standard by investing in technological product innovation.

Manufacturing products specifically designed to maintain original equipment manufacturers' specifications.

Interacting with and supporting all original equipment manufacturers.

GETTING TO KNOW YOUR GRINDER

This machine is intended for reel mower reel blade 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.

Adjustable Reel Clamping Mechanisms for ease of installation. Two chain vise grips included to secure any size roller.

Independently Controlled Variable Spin Drive for optimum grinding performance.

Positive Vertical and Horizontal Reel Adjustments for fast alignment of the reel in the machine.

Dial Indicator Setup Gauge to align reels with accuracy up to .001".

Accessible Control Panel with independent switches for grinding motor, carriage traverse with variable speed control, spin drive with variable speed control, and a safety stop button.

Positive Infeed and Height Adjustment for exact positioning of the reel and measured metal removal.

Electro-Magnetic Traversing Switch for easily adjustable traversing length.

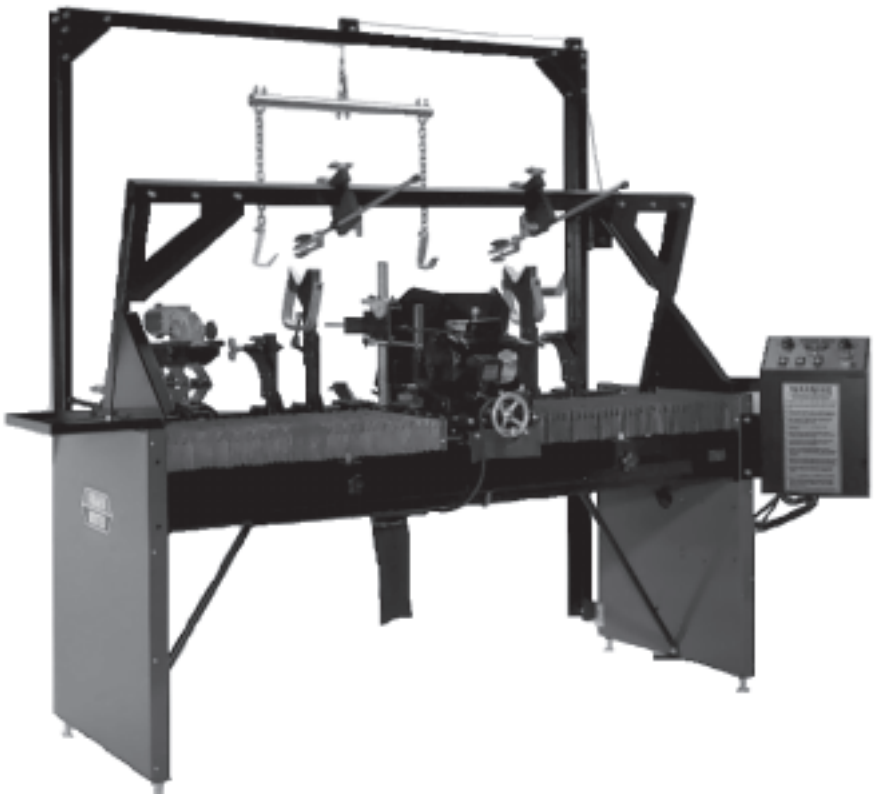
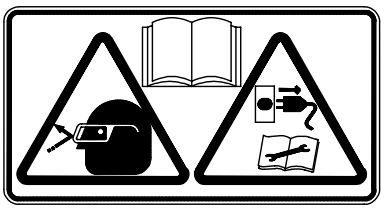


FIG. 1

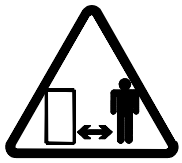
SPECIFICATIONS

Traversing Switches	Solid state, non-contacting proximity switches
Carriage Travel	45"
Overall Width	98"
Overall Height	80"
Overall Depth	50"
Weight	880 lbs
Base Construction	Precision Machined heavy duty reinforced welded steel base
Carriage Rails	Precision Ground, Hardened Steel
Grind Head Motor	3/4 HP at 60 HZ, 5/8 HP at 50 HZ, 3450 RPM at 60 HZ, 2875 RPM at 50 HZ
Elevator	400 lbs. capacity
Spin Drive	Reversible variable speed 0-400 RPM DC Gear Motor 1/5 Hp
Auto Traverse	Ball bearing threadless roller drive with built in overload protection
Grinding Head	90 degrees rotatable head with pin lock locations for grinding bedknives
Rail covers	Telescoping bellows

GETTING TO KNOW YOUR GRINDER (Continued)



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



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

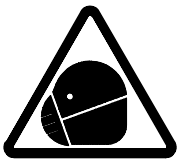
Symbol for sharp object which will cause serious injury.

Symbol for hot surface which could cause burns.

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

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

Symbol for hearing protection required when operating this machine



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

Low Voltage Relay

The grinder is equipped with a low voltage relay which is factory preset at 100 VAC. If the power supply line does not deliver 100 VAC power under load, the relay will open and trip out the starter. If this occurs, your power supply line is inadequate and must be correct before proceeding further with the grinder.

DAILY MAINTENANCE BY THE OPERATOR

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.

GETTING TO KNOW YOUR GRINDER (Continued)

GETTING TO KNOW YOUR MACHINE

The following is an explanation of the machine components you will be using when setting up reels to grind on your new Spin Grinder. You should familiarize yourself with each part as this grinder has been engineered to spin and relief grind almost every type and make of reel mowers available today. An adjustment of the various fixtures will be necessary for different types of reels.

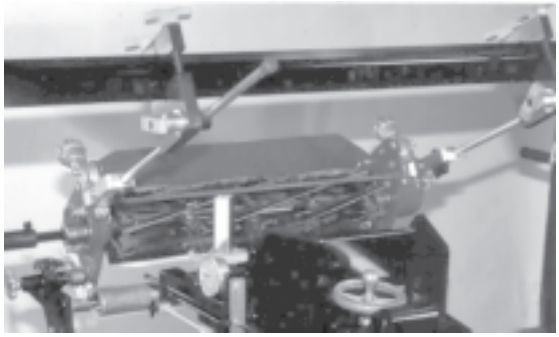


FIG. 2

OVERHEAD MOWER CLAMP ASSEMBLY

Each overhead mower clamp assembly consists of two rectangular bar clamps (top and bottom), which also contain adjustable holding fixtures into which is placed the mower clamps. These clamps will be positioned on the overhead square bar as shown in FIG. 2 and FIG 3. They are designed to lock into place and not move during the grinding procedure. Included are two sizes of clamp lips, normally the smaller will be used.

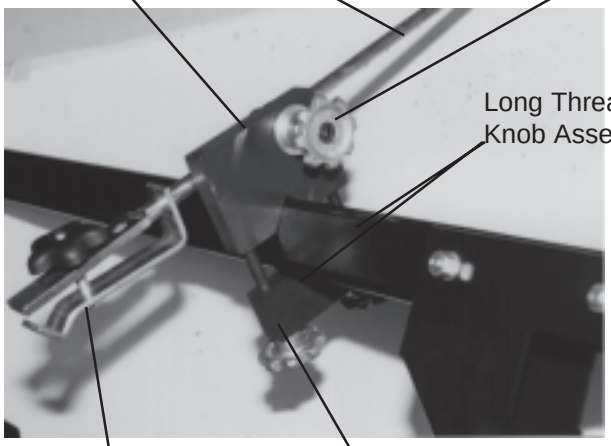


FIG. 3

REEL HUB SUPPORT

The reel hub support consists of a lower mounting bracket that fits over the square tooling mounting bar and two threaded locking screws. Attached to this is the upper "V" bracket that cradle the reel hub when in position. There are three vertical adjustments on this fixture, but will normally be used in the upper hole position. See FIG. 4.

These brackets can be mounted on the square mounting bar with offset either forward or backwards, but the normal position will be with the "V" centered over the bar or with the offset facing the back of the machine. The hold-down swing arm has an upper and lower mounting position depending on mower hub size.

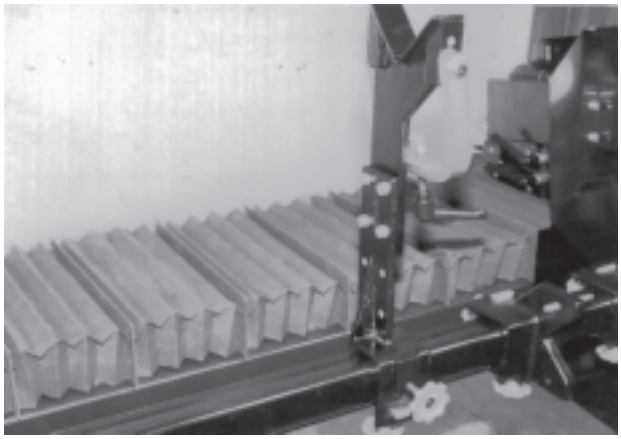


FIG. 4

CENTER MOUNTING BRACKETS

The centers mounting brackets consist of a stationary center bracket and an adjustable center bracket. The stationary bracket will normally be used on the left hand side of the mounting bar when facing the reel loading position. These centering fixtures are used on greens mowers or any reel that does not have a hub that can fit into the "V" bracket. See FIG. 5.

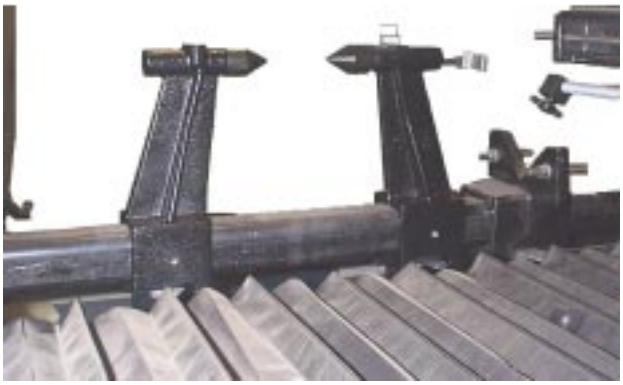


FIG. 5

GETTING TO KNOW YOUR GRINDER (Continued)

THE HARD KNOBS ON THE SQUARE BAR MUST BE VERY TIGHT OR THE REEL CAN LOOSEN CAUSING POOR GRIND QUALITY. KNOBS CAN BE ADDITIONALLY TIGHTENED WITH AN ALLEN WRENCH TO ENSURE MAXIMUM LOCKING POWER.

ROLLER SUPPORTS

There are two roller supports that are mounted to the square mounting bar so that the "V" faces the back of the machine as pictured. See FIG. 6.

There are four long set screws on these brackets which are used to hold the extender plates when it is necessary to move mower roller back further to help expose the drive nut in the reel. These set screws will also be used to attach the vice grip chain clamps when reels are in position. See FIG. 7.

REEL GUIDE FINGERS

There are two reel guide fingers included with your grinder. They are used to relief grind reels after the reel has been spun ground. The wider factory mounted finger will normally be used, See FIG. 8 & 9, but on reels where there is not enough room between blades or reel to end frame clearance, the stamped narrow finger will have to be used. See FIG. 10.

At the factory, the finger is installed with the high point of the finger positioned at the left hand corner of the grinding wheel for a normal helix reel, viewed from the relief finger side. It might be necessary on reels that have a reverse helix to reposition the support finger. When using the stamped thin finger it is necessary to dress the grinding wheel so that the high point of the finger is positioned where the grinding wheel makes contact with the reel.

FIG. 6

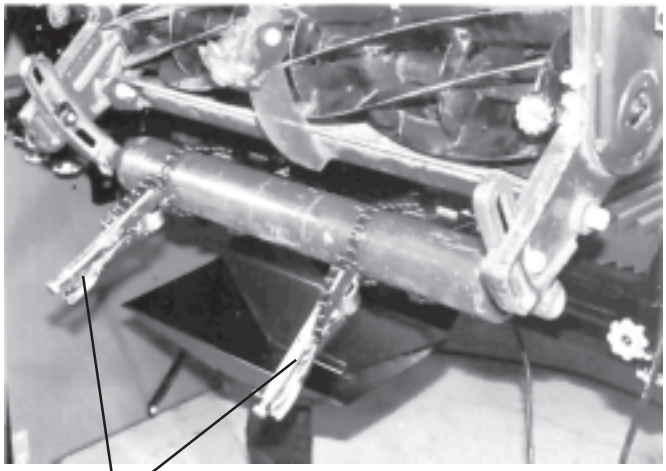


FIG. 7

End View of the Reel
Grinder Finger & Support

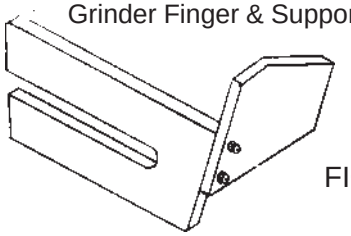


FIG. 8

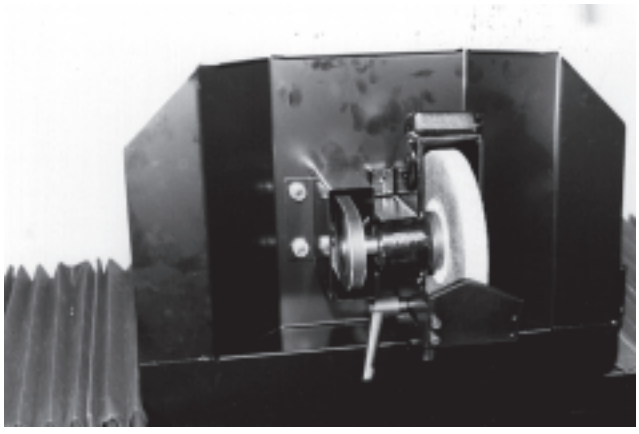


FIG. 9

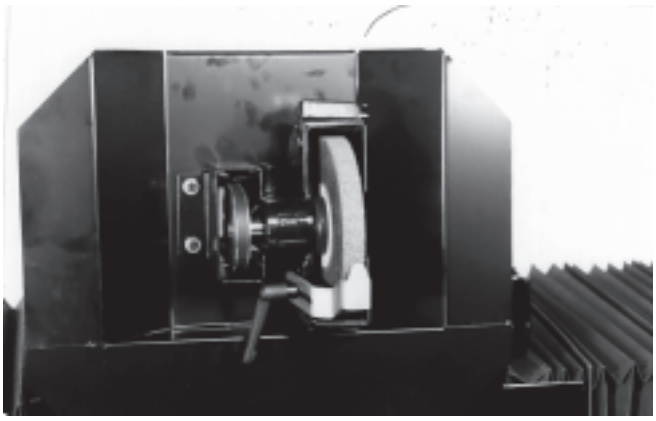


FIG. 10

GETTING TO KNOW YOUR GRINDER (Continued)

DRESSING STICK

The included dressing stick is used to dress the grinding wheel when it loads up or glazes over. Normal spin grinding will dress the wheel automatically, but hand dressing could be necessary when relief grinding.

TRAVERSE ACTUATOR RELEASE

The actuator that drives the grinding carriage left and right can be released to allow manual movement of the grinding carriage. The actuator release arm is located at the front of the carriage under the infeed handwheel. See FIG. 11 and FIG. 12. Rotate the release arm clockwise 1/2 turn to release actuator and counterclockwise 1/2 turn to engage actuator.

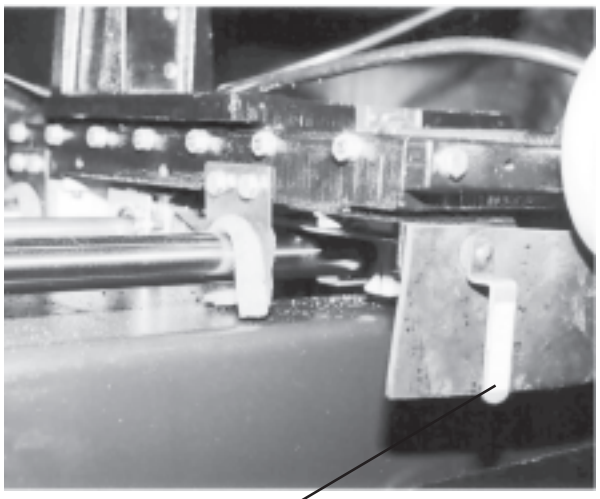


FIG. 11

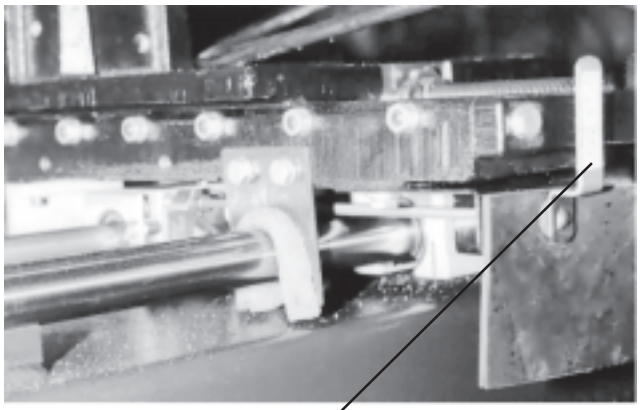


FIG. 12

PROXIMITY SENSORS

The Spin Relief Grinder is equipped with proximity sensors to change the traversing directions. These are adjustable by loosening the star knob and sliding them along the rail and retightening to control traverse distance. See FIG. 13.

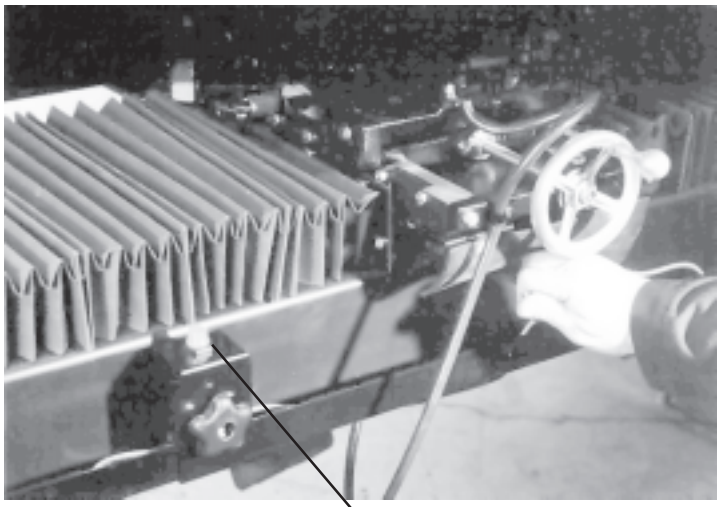


FIG. 13

GETTING TO KNOW YOUR GRINDER (Continued)

CONTROL PANEL COMPONENT IDENTIFICATION

Review the following control panel knob descriptions before preceding on with the instructions.

TRAVERSE SPEED KNOB: ⇦⇨

Controls the feet per minute travel of the carriage and grinding head. Adjusts from 0-35 feet per minute.

SPIN DRIVE DIRECTIONAL SWITCH: (Forward/Backwards):

Controls the direction of rotation of the spin drive unit.

THE MOTOR MUST COME TO A COMPLETE STOP BEFORE CHANGING DIRECTIONS. IF THE MOTOR DOES NOT COME TO A COMPLETE STOP, SERIOUS DAMAGE TO THE CONTROL MAY RESULT. BYPASS OF THE SWITCH CENTER HESITATION PAUSE MAY RESULT IN DAMAGE TO THE CONTROL.

SPIN DRIVE SPEED KNOB:

Controls the revolutions per minute of the spin drive unit. Adjusts from 0-400 RPM.

START BUTTON (Green):

This button acts as a reset or system start button after the emergency stop button has been pushed.

ANY SWITCHES IN THE ON POSITION WILL IMMEDIATELY START WHEN THE START BUTTON IS PUSHED.

EMERGENCY STOP BUTTON (Red):

This button will totally shut down all power to the machine. To restore power, pull up on the button and press the start button

PUSHING THE EMERGENCY STOP BUTTON DOES NOT STOP ALL POWER TO THE GRINDER. POWER IS STILL DELIVERED TO THE INFEED SIDE OF THE MAGNETIC CONTACTOR. DISCONNECT THE CORD AT THE WALL OUTLET BEFORE PERFORMING SERVICE.

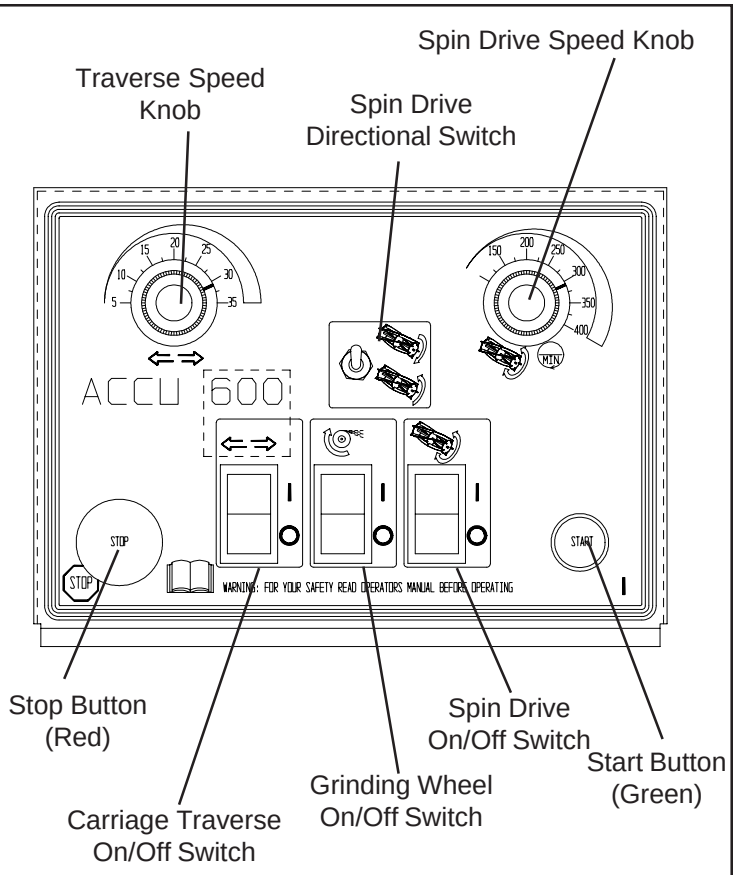


FIG. 13

SPIN DRIVE ON/OFF SWITCH:

Controls the electrical power to the spin drive unit.

GRINDING WHEEL ON/OFF SWITCH:

Controls electrical power to the grinding head motor.

CARRIAGE TRAVERSE ON/OFF SWITCH:

Controls electrical power to the carriage traverse.

SAFETY INSTRUCTIONS

PLEASE TAKE SPECIAL NOTE OF THE FOLLOWING WARNING DECALS LOCATED ON THE CONTROL PANEL AND WINCH OF THE MODEL 600.

--WARNING--

FOR YOUR OWN SAFETY READ ASSEMBLY AND OPERATING MANUAL BEFORE OPERATING.

1. Always use safety glasses and ear protection.
2. Do not wear gloves, neckties, loose clothing, etc.
3. This machine operates with a large amount of hot sparks. Do not operate near flammables.
4. Stay clear of grinding wheel contact area when grinding. Always stay clear of all rotating and moving parts.
5. Insure adequate dust control before operation.
6. Only properly trained personnel should operate the machine. Keep all visitors a safe distance from the machine.
7. Be certain that the cutting unit is securely fastened with the clamps and handles provided before operating.
8. Do not ever exceed maximum operating speed marked on the grinding wheel. (Read grinding wheel safety section in your manual before grinding.)
9. Disconnect your machine from the main power source before performing any adjustments, mechanical servicing or electrical servicing.
10. When machine is in automatic cycle, do not leave the work area without turning off power.
11. Keep all guards in place and in good repair.
12. Before operating, inspect the machine for loose, damaged, or missing parts. If found, repair or replace. Remove all tools from operating area.

--WARNING--

1. Lifting winch capacity 400 lbs. maximum.
2. Always have the lifting hooks securely attached and balanced on the cutting unit before lifting.
3. Stand well clear of the cutting unit when winching into position. Guide with extended arms only.
4. The winch is equipped with a safety ratchet. Do not defeat or override this safety feature.
5. Read warning label on winch handle and the assembly and operating manual before using the winch.

SEE PAGE 3 FOR GRINDING WHEEL SAFETY.

OPERATING INSTRUCTIONS

PREPARE MOWER FOR SHARPENING

Preparation of the reel prior to sharpening. It is recommended that the reel to be sharpened is thoroughly cleaned. Remove wheels and bed bar, if possible 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.

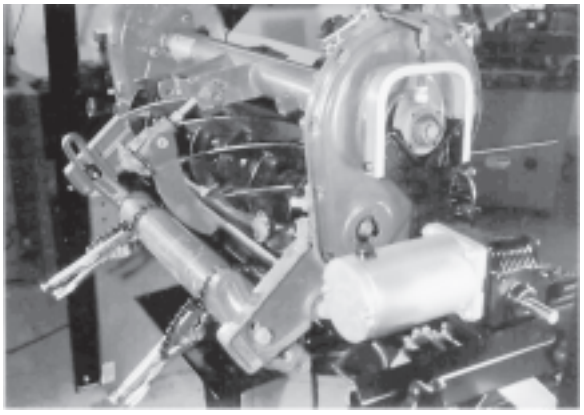


FIG. 15

REELS WITH EXCESS TENSION ON THE BEARINGS WILL BE EXTREMELY DIFFICULT TO SPIN GRIND AND COULD CAUSE DAMAGE TO THE REEL OR THE SPIN DRIVE MECHANISM ON YOUR GRINDER. NO MORE THAN 25 IN LBS. MAXIMUM TORQUE LOAD TO ROTATE THE REEL IS ALLOWED OR DAMAGE TO THE SPIN DRIVE COULD OCCUR.

REELS GROUND WITH BEARINGS WHICH HAVE WEAR AND/OR FREE PLAY WILL NOT HOLD DIAMETER, CONE SHAPE, OR STRAIGHTNESS SPECIFICATIONS.

INITIAL SET UP OF REEL SUPPORTS

A. On fairway mowers with exposed hubs, you will use the "V" reel hub supports. Normally they will be positioned in the top two holes of the lower supports with the offset "V" facing the rear of the machine. See FIG. 15.

B. With fairway mowers without exposed hubs or normally all greens mowers, you will use the centers mounting brackets. They are mounted with the offset facing the back of the machine and mounted to the center holes in the lower support. See FIG. 16.

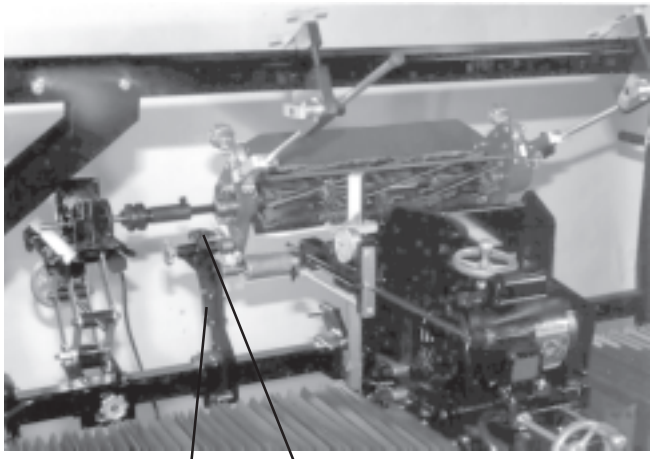


FIG. 16

FIRMLY TIGHTEN ALL LOCKING KNOBS BEFORE GRINDING. ANY LOOSENESS WILL ADVERSELY AFFECT GRINDING QUALITY. KNOBS CAN BE ADDITIONALLY TIGHTENED WITH AN ALLEN WRENCN TO INSURE MAXIMUM LOCKING POWER.

NOTE: Because of the many different reels available the exact position of either the "V" bracket or the centers brackets to the lower support can be adjusted to three different height settings and two offset positions.

INITIAL SET UP OF SUPPORTS (Continued)
"V" BRACKET SET UP

On reels with exposed hubs where you will be using the "V" brackets, measure the distance from the outside of the hubs and subtract one inch. Determine the middle of the square mounting bar, by use of the winch cable. Then place a "V" bracket 1/2 that distance on the left side of the mounting bar and securely fasten--use both locking knobs.

NOTE: Tighten the side locking knob first so the bracket is forced against the mounting bar. Then tighten the bottom bracket. See FIG. 17.

Now place a "V" bracket on the right side of the mounting bar the same distance from the centerpoint, but loosely attach as it might have to be moved when reel is lifted into place.

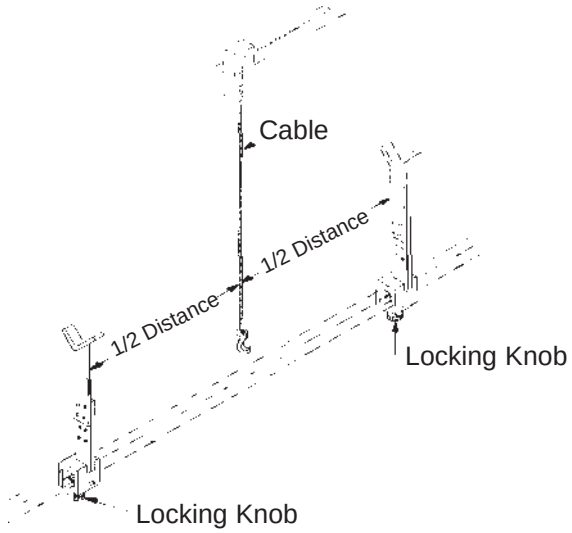


FIG. 17

CENTERS BRACKET SET UP

When mounting reels with no exposed hubs, centers will be used to hold the mower unit. See FIG. 18. To mount, measure the outside distance of the mower frame. Using the centerpoint of the square mounting bar position the fixed centering bracket 1/2 that distance on the left side and securely fasten.

Then place the adjustable centering bracket that distance plus 1/4" 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.

FIG. 18

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.

INITIAL SET UP OF ROLLER SUPPORTS

The roller support brackets should be placed 6 to 8" inside the reel supports with the "V" facing the back of the machine and securely fastened with both locking knobs. The "V's" have an offset so they can be installed high or low depending on the reel. See FIG. 19.

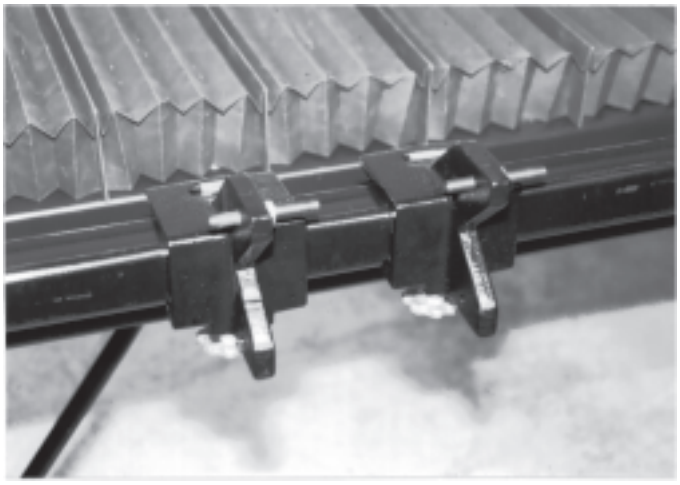


FIG. 19

LIFTING REEL INTO POSITION WHEN USING THE "V" MOUNTING 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 clamps 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. 20.

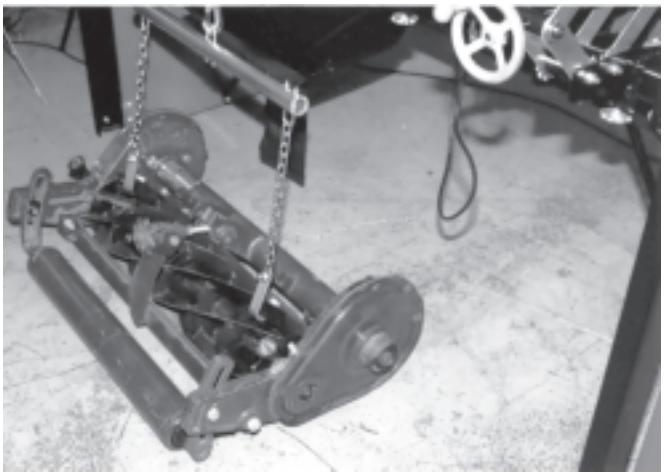


FIG. 20

THE OPERATOR SHOULD BE POSITIONED AWAY FROM THE REEL. DO NOT STAND UNDERNEATH THE REEL AS IT IS BEING RAISED. GUIDE REEL AT ARMS LENGTH.

Slowly raise the reel by cranking the winch handle with the left hand and steadying the reel with the right hand. Your right arm should be extended during the lifting operation--this will help keep the operator away from under the mower.

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 when this brake is engaged.

When the hub of the reel has been raised above the top of the "V" bracket slowly position the left side of the reel into the bracket and lower until you make contact with the bracket.

Now reposition the right "V" bracket if necessary and lower the reel completely into both brackets. Securely tighten the right bracket using both locking knobs.

NOTE: On reels that have a square or hexagon shaped hub make sure that the surface of the hub is against the flat machined surface of the "V" bracket.

When the reel is correctly positioned in the V-bracket, swing the clamping handles into place and firmly lock in place. See FIG. 21.

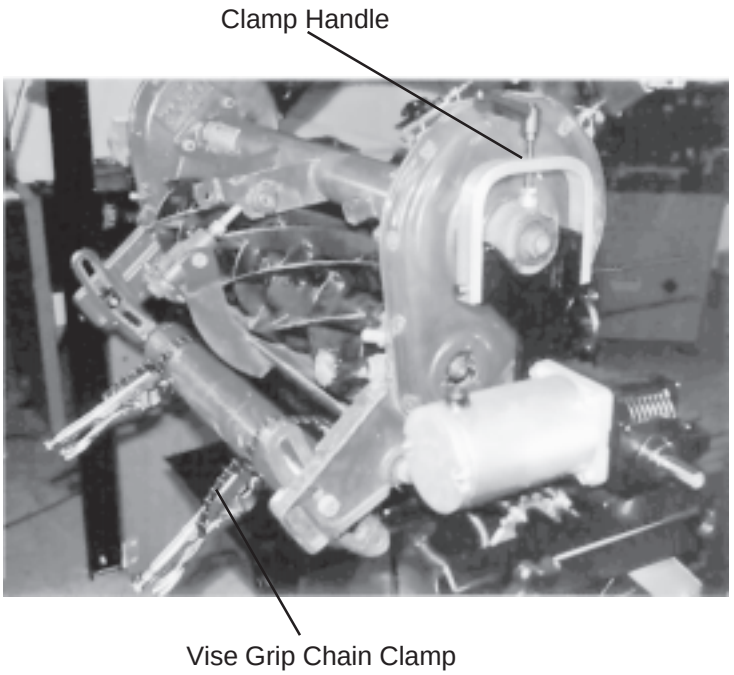


FIG. 21

NOTE: The clamping handles have two mounting positions for large and small hubs.

NOTE: Unless the elevator hooks interfere with the reels ability to spin, leave the elevator hooks and spreader connected to the reel with slight tension on the wire cable.

LIFTING REEL INTO POSITION WHEN USING CENTER BRACKETS

Position reel as when using the "V" brackets and attach elevator spreader bar. Slowly raise the reel into position and insert the fixed centering pin into a predetermined hole in the reel frame. While holding the reel firmly against the fixed centering pin, raise or lower the reel so the adjustable centering bracket can be moved and the cone inserted in a corresponding hole in the opposite side of reel frame. Now very firmly tighten both locking knobs on the adjustable bracket and then tighten the adjustable centering pin locking knob. See FIG. 22

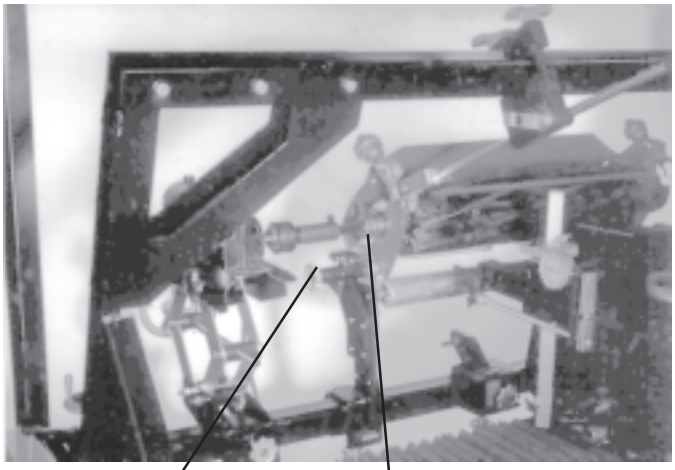


FIG. 22

Make sure that the spin drive can be attached to the reel at this time. You are furnished with two extension plates that can be mounted to the roller braces that will move the reel 2" back if more clearance is necessary.

The spin unit attaches to a drive nut located under a cover in the outer housing of the reel. Remove the cover at this time to insure that the spin drive unit will connect to the reel. This is the same drive nut that is used for backlapping. Do not connect at this time just make sure that the connections are close enough to attach at a later time.

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 POOR QUALITY.

SECURING ROLLER TO ROLLER BRACES

There are two (2) roller supports that are mounted to the square mounting bar so that the "V" faces the back of the machine as pictured in FIG. 24A.

There are four (4) long set screws on these brackets which are used to hold the extender plates when it is necessary to move mower roller back further to help expose the drive nut in the reel. These set screws will also be used to attach the chain vise clamps when reels are in position.

Position the roller braces so the reel roller is centered on the two (2) braces and firmly lock in place.

NOTE: On some reels the "V" grooves of the roller support will be positioned on top of the support bar. This application is used primarily for green mowers. See FIG. 24B.

If extender plates are necessary to move reel back further, simply pull reel back out of the way and slide extender plate onto both long socket head set screws and tighten down with 3/8-16 nuts and 3/8 lockwashers. See FIG. 24C.

MAKE SURE THAT THE ELEVATOR CABLE IS ATTACHED TO THE REEL AND THAT SOME TENSION IS ON CABLE BEFORE PULLING REEL BACK.

When the reel roller is positioned correctly in the roller brace, wrap one of the chain vise clamps around the roller, and around the stud on the roller brace. Firmly tighten and repeat this step with the other chain vise clamp around the other roller brace. See FIG. 23.

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.

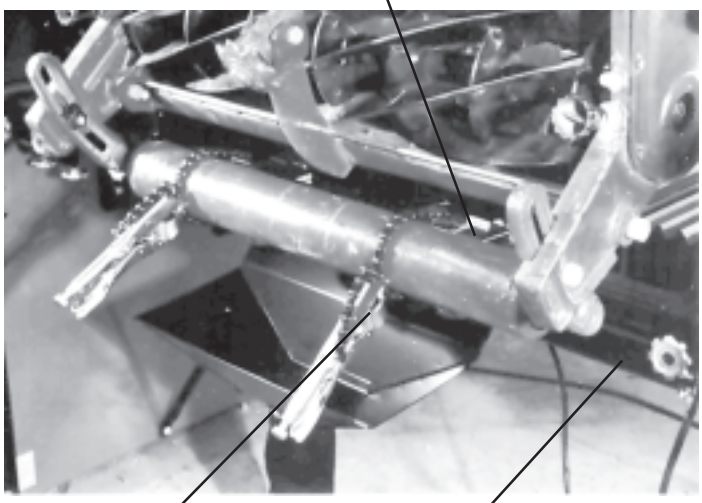


FIG. 23

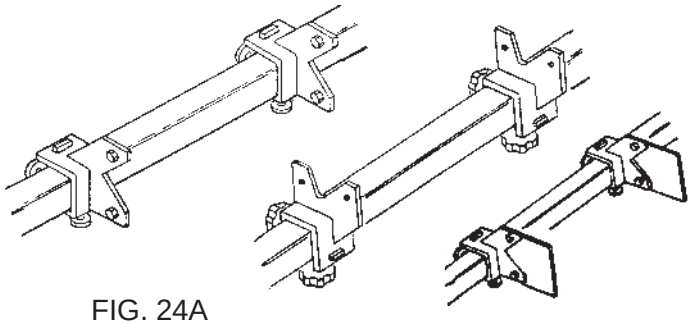


FIG. 24A

FIG. 24B

FIG. 24C

ATTACHING THE OVERHEAD CLAMPING ARMS

You are furnished with two sizes of clamping lips, determine which size is appropriate for the reel you are grinding. Normally the smaller size is used.

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 the reel cross bar. Tighten the clamping lips to the mower, then securely tighten the two (2) locking handles on each overhead clamp. See FIG. 25 and FIG. 26.

DO NOT TIGHTEN THE SLIDE BAR CLAMP WHERE RODS ARE INSERTED INTO THE LOWER PART OF THE CLAMP UNTIL REEL HAS BEEN ALIGNED.

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.

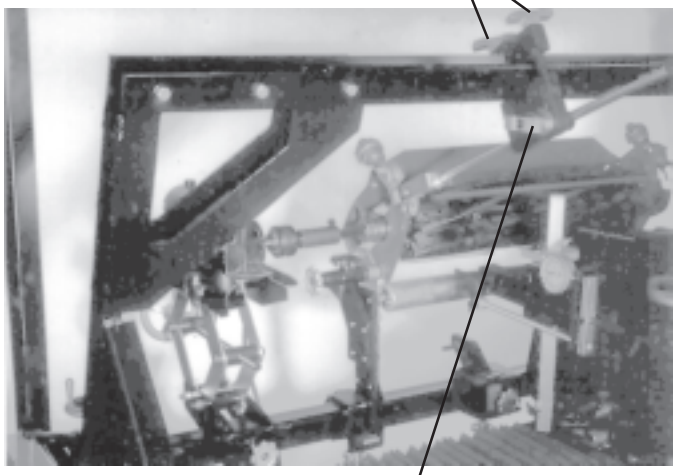


FIG. 25

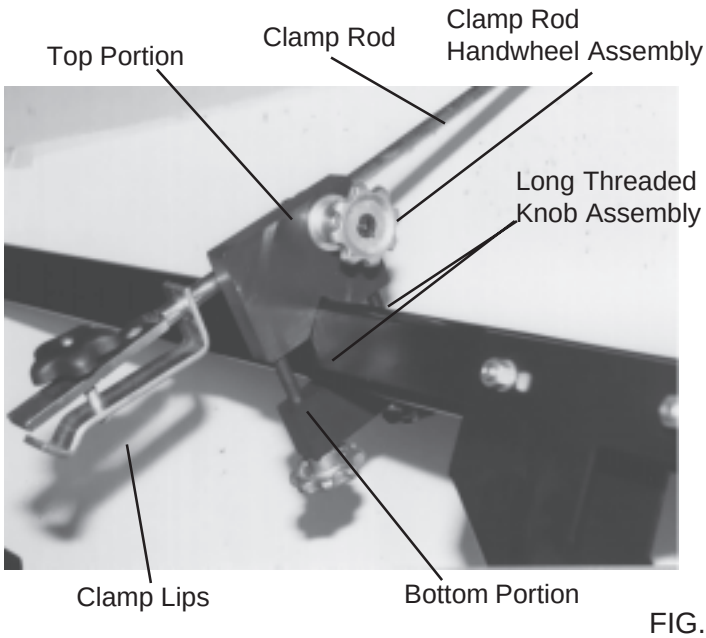


FIG. 26

ATTACHING THE VARIABLE SPEED SPIN DRIVE UNIT TO THE REEL

When spin grinding, the reel should turn in the same direction as the grinding wheel. See FIG. 27. The normal position for the spin drive unit is on the right side of the square mounting bar when viewing from the mowing unit loading position of the machine.

Before positioning the spin drive unit, familiarize yourself with the available adjustments and coupler/ drive assemblies.

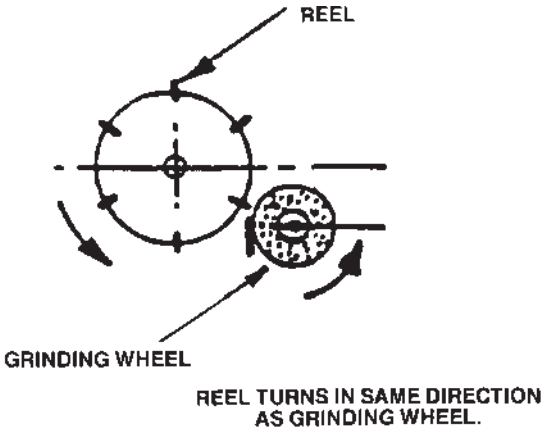


FIG. 27

KNOB A--
Adjusts the scissor bar to move the unit up and down.
KNOB B (2 EACH)--
Allows the spin unit to be loosened and moved in and out.
KNOB C & D--
Allow the spin assembly to be loosened from the support bar frame and moved side to side.

When positioning the spin unit it will be necessary to complete several of the above adjustments to properly align the spin unit to the reel.

A. Rubber Sleeve Coupler: This is placed in the corresponding flange coupler already mounted in the spin drive shaft.
B. Drive Coupler Assembly: This is mounted to the rubber coupler.
C. Adapter Sleeve: Connects the rubber coupler to the square drive adapter.
D. Square Drive Adapter: This is inserted into the drive coupler adapter and should be able to be moved approximately 2". It will be necessary to move this when attaching reel to spin drive unit. It is then inserted into any 1/2" square drive socket. This square shaft has a groove machined into it on the opposite end of the snap ring. This groove is there to advise that you have reached the maximum extension of the square drive shaft. If you cannot connect to the reel without extending past this groove, then the spin unit must be repositioned on the tooling bar (knobs C & D above).

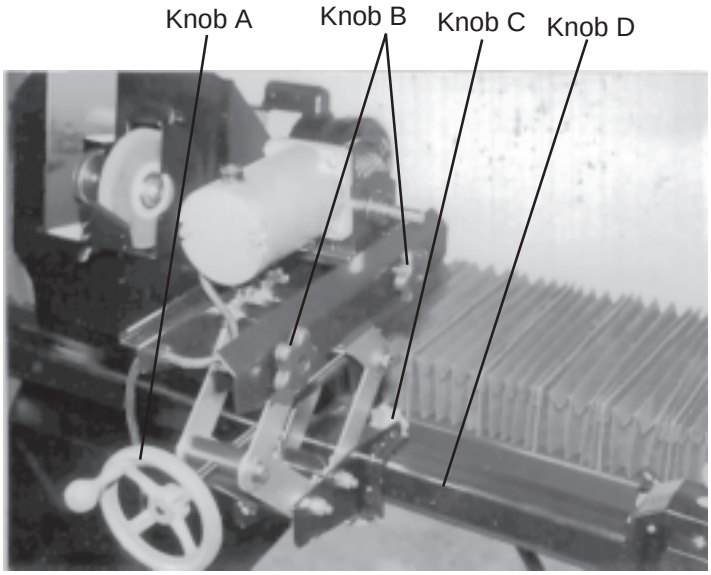


FIG. 28

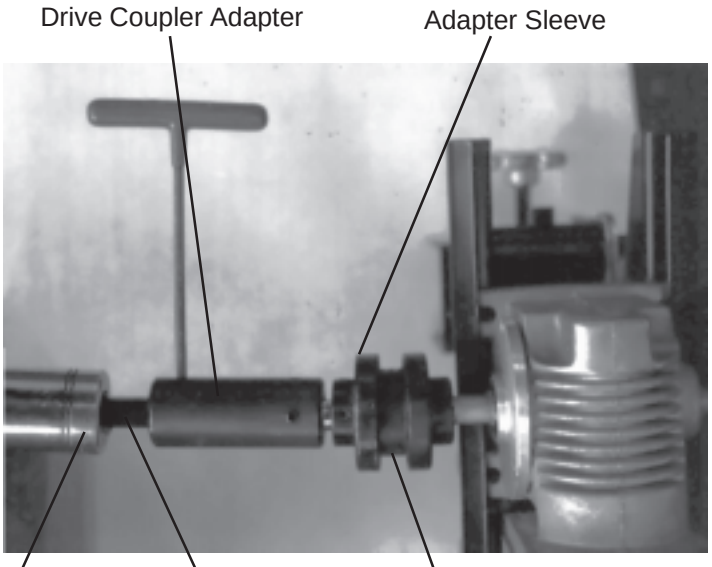


FIG. 29

DO NOT EXTEND SQUARE SHAFT PAST GROOVE, INSTEAD REPOSITION SPIN UNIT.

OPERATING INSTRUCTIONS (Continued)

NOTE: The 1/2" square drive socket that is places on the reel when spin grinding is NOT included with the grinder. You must purchase this from an appropriate local supplier of tools.

The following procedures will make setting up the spin drive unit easier.

1. Move spin drive unit close to the reel. Align the shaft on the spin drive with the drive nut on reel by completing the necessary adjustments discussed on the previous page.
2. Now slide the spin drive unit approximately 7" from the reel drive coupling point and securely fasten to the square mounting bar tightening both locking knobs.
3. Place the proper 1/2" square drive socket on the reel drive nut and then insert the square drive shaft into the socket. Place the adapter sleeve over the drive shaft and insert the drive coupler adapter assembly into it. Finally place the rubber coupler onto the drive coupler adapter. See FIG. 30.
4. By holding the square drive shaft firmly into position with your left hand you will be able to move the other components to the right and insert the rubber coupler into the flange on the spin drive unit. When this is done tighten the set screw with the supplied 1/8" T-handle hex key on the adapter sleeve to hold all parts in place.
5. Finally re-adjust the spin drive unit if it is not in alignment.

NOTE: It is not necessary to have perfect alignment but it must be close enough so that the coupler remains engaged and that excess torque is not applied to the reel.

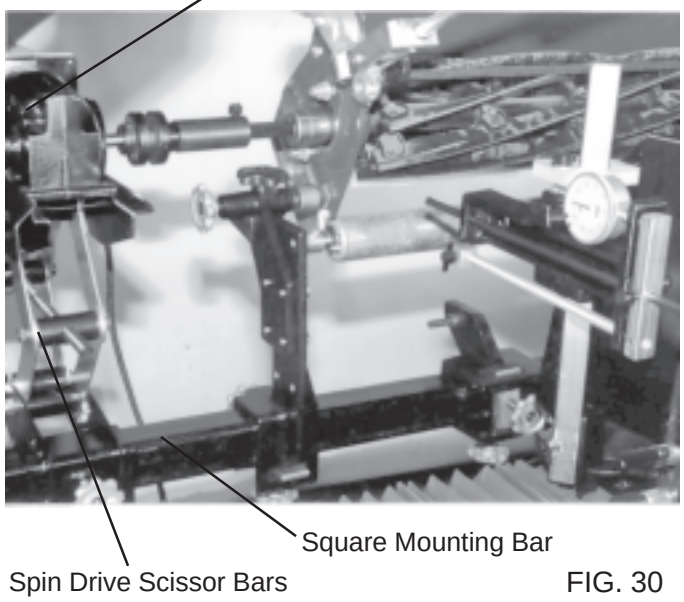


FIG. 30

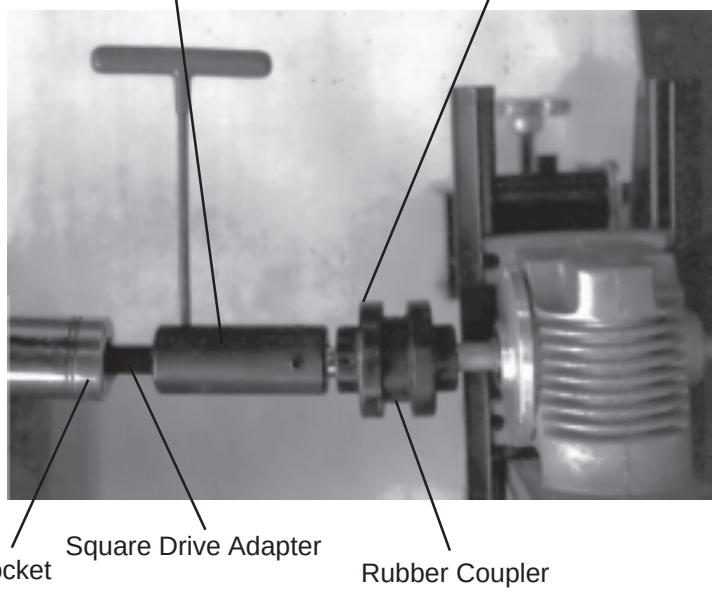


FIG. 31

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 winch 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 spinning 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. 32.

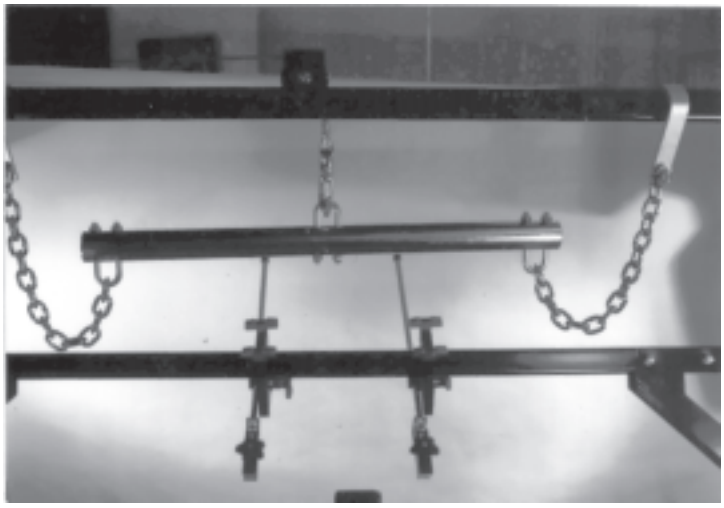


FIG. 32

DIAL INDICATOR SET UP FIXTURE

The dial indicator set up fixture is designed to be quickly mounted into position and/or quickly removed.

The fixture is mounted to the front left corner of the grinding head assembly as shown in FIG. 33.

When the fixture is not in use, it is quickly removed and can be stored in the hole in the tool tray as shown in FIG. 34.

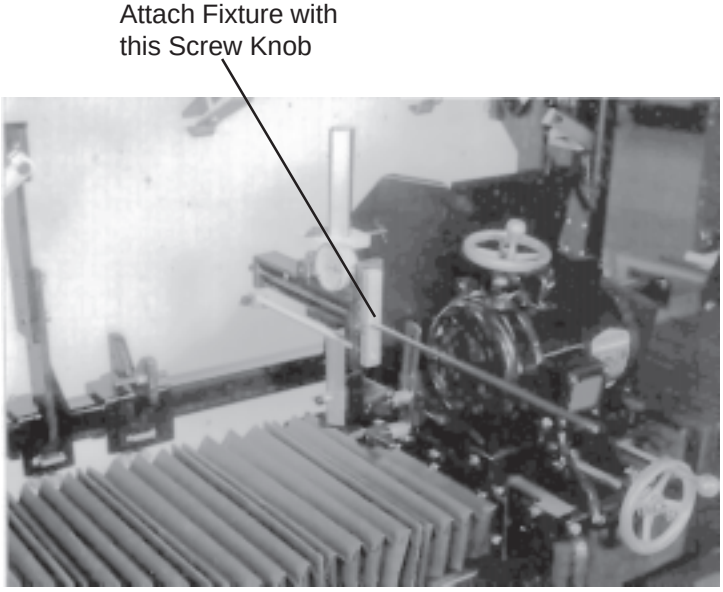


FIG. 33

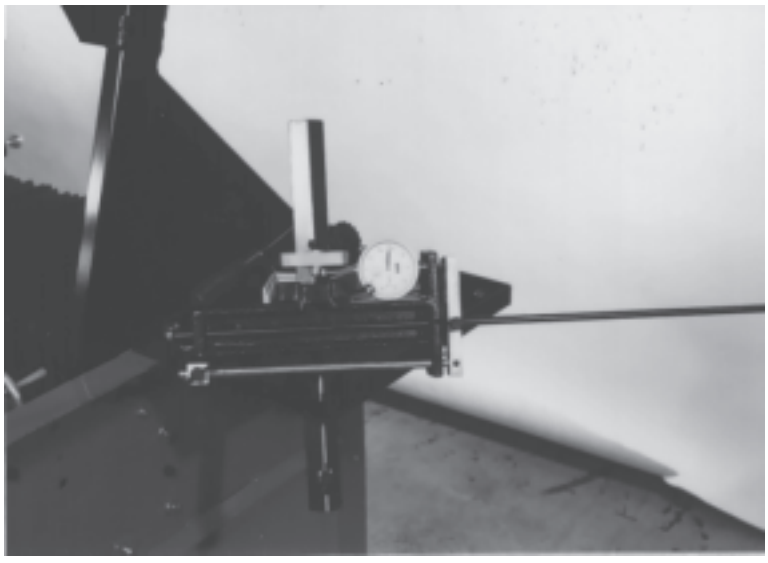


FIG. 34

REEL ALIGNMENT USING THE DIAL INDICATOR SET UP FIXTURE

A. Mount the set up fixture into position on the left front side of the grinding head assembly. See FIG. 33.

B. Generally it is preferred to have both overhead clamp rod adjusting knobs (See FIG. 36.) loose to allow the mower assembly which is mounted on the mower support bar to move freely when doing horizontal and vertical adjustments. Due to the configuration of some mower assemblies this cannot always be done. Some mowing units rely on the overhead clamp rods to support the unit and give rigidity. In these cases, the overhead clamp rod on the non-moving end of the mower support bar (right side from operator position) must be tight with the movable end (left side) only overhead clamp rod loose.

   The overhead clamp rods will generally be used as described below:

   1. If the mowing unit is clamped in the V-brackets and the ground roller is clamped with chain vice clamps, then both overhead clamp rod adjusting knobs can be loose.
   2. If the mowing unit is mounted in centers and the ground roller is clamped with the chain vice clamps, then generally both of the overhead clamp rod adjusting knobs can be loose. The exception is when mounted in centers and with the ground roller clamped, because the geometry does not offer enough stability or rigidity, then the overhead clamp rod on the fixed end (right side in the operator's position) should be kept tight.
   3. If the mowing unit is mounted in centers and only being stabilized by the overhead clamp rods, then the clamp rod on the fixed end must be kept tight.

C. Loosen the two locking knobs on the pivot assembly on the left side of the square mounting bar so that it can be adjusted in both the vertical and horizontal plane. See FIG. 35.

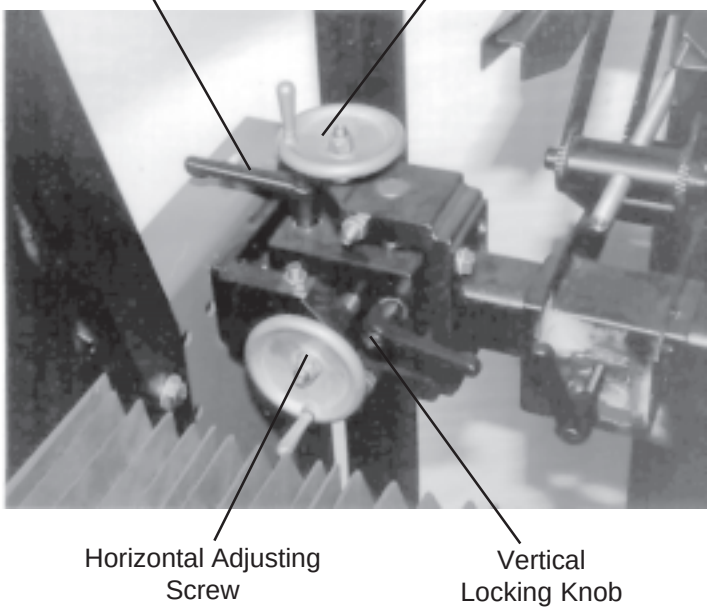


FIG. 35

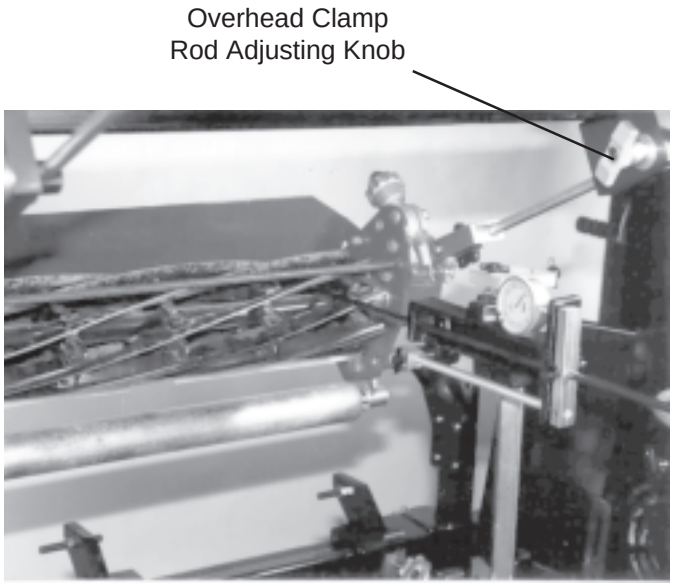


FIG. 36

OPERATING INSTRUCTIONS (Continued)

ALIGNING REELS IN THE VERTICAL PARALLELISM PLANE

A. Move the grinding head assembly until the set up fixture is approximately 1" from the right side of the reel. Lock the Knob A within approximately 1/4" of center shaft of the reel. See FIG. 39.
B. Raise the indicator slide casting on the vertical support so that the indicator rod can be extended over the center shaft of the reel. See FIG. 37.
C. Lower the indicator slide by turning the vertical fine adjustment Knob B until the alignment rod lightly touches the top of the reel center shaft. See FIG. 41.
D. Pull rod back and lock Knob C. See FIG. 39. Traverse to the other side of reel, same distance from end. Loosen Knob C and extend alignment rod.
E. If the left side is lower than the right, turn the vertical adjusting screw in the pivot assembly clockwise raising the mounting bar and the reel until the center shaft of the reel lightly touches the extended indicator rod. See FIG. 35.

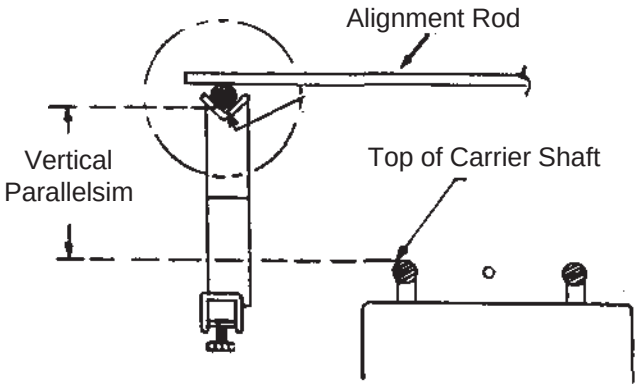


FIG. 37

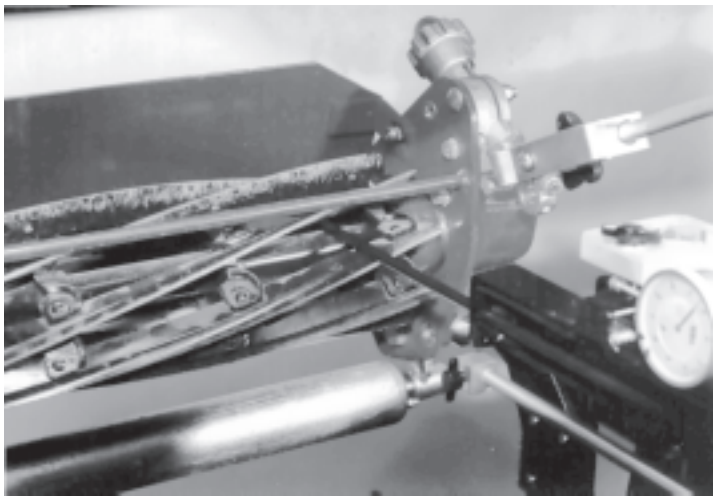


FIG. 38

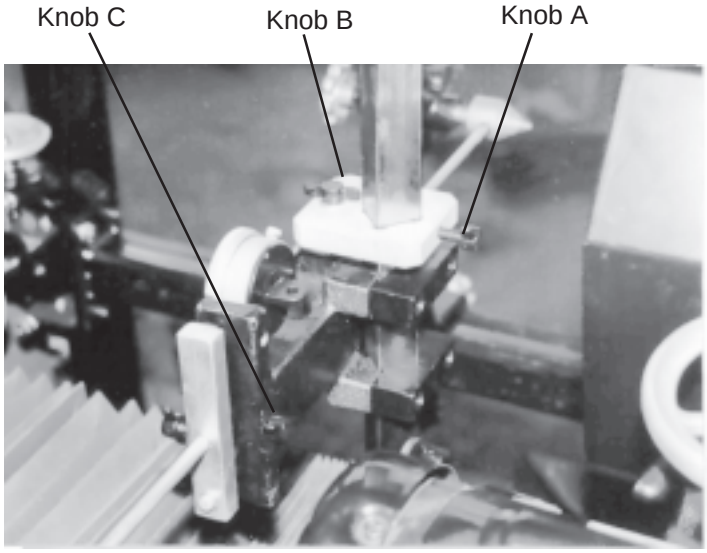


FIG. 39

FIG. 40

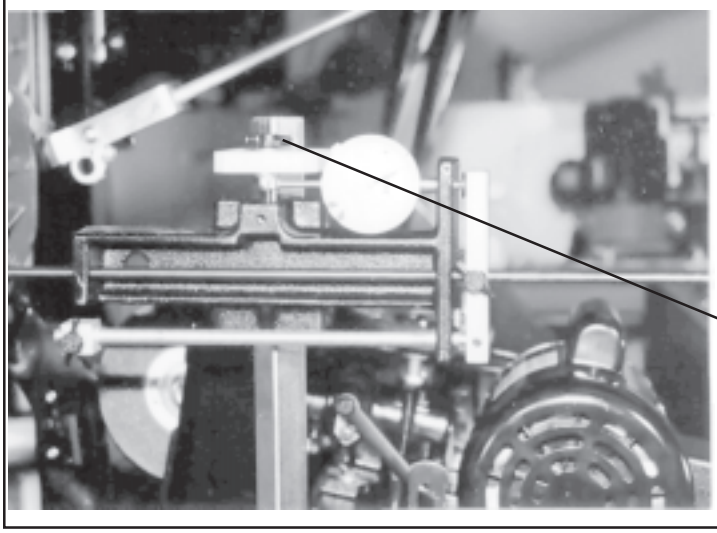


FIG. 41

VERTICAL ALIGNMENT (Continued)

F. Take note of the knob so you know where you are starting from. See FIG. 43. Now turn the vertical adjusting screw 1 more revolution. This 1 revolution is to compensate for the fact that as you adjust the left side, the right side is also moving at a ratioed amount. This should almost align your reel in the vertical parallelism plane. See FIG. 43.

G. Move the alignment fixture back to the right hand side of the reel and readjust the alignment rod so that it lightly touches the top of reel center shaft.

H. Move is back to the left side to make sure the reel is in correct vertical position. If not, move vertical adjustment handle up or down so that it just touches alignment rod on both sides. When it does, no further alignment is necessary.

I. If the left side of the reel is found to be higher than the right, lower the mounting bar and reel until alignment rod lightly touches the top of the reel center shaft and then turn the vertical adjusting screw an additional 1 revolution. This 1 revolution is to compensate for the fact that as you adjust the left side, the right side is also moving at a ratioed amount. This should line the reel up accurately on both sides. Then continue with procedures found in "G" and "H."

J. Now lock the vertical adjusting screw locking knob. See FIG. 43.

NOTE: This alignment is not as critical as the horizontal plane, but care should be taken on all reel set ups. The accuracy need only be approximately .010".

NOTE: The pivot end of the support bar is pinned to the frame permanently. The adjustable end can be adjusted independently both vertically and horizontally.

CAREFULLY REVIEW THE CORRECT IDENTIFICATION OF THE LOCKING KNOBS IN FIG. 43 MAKE CERTAIN YOU ARE LOCKING AND UNLOCK ING THE CORRECT KNOBS.

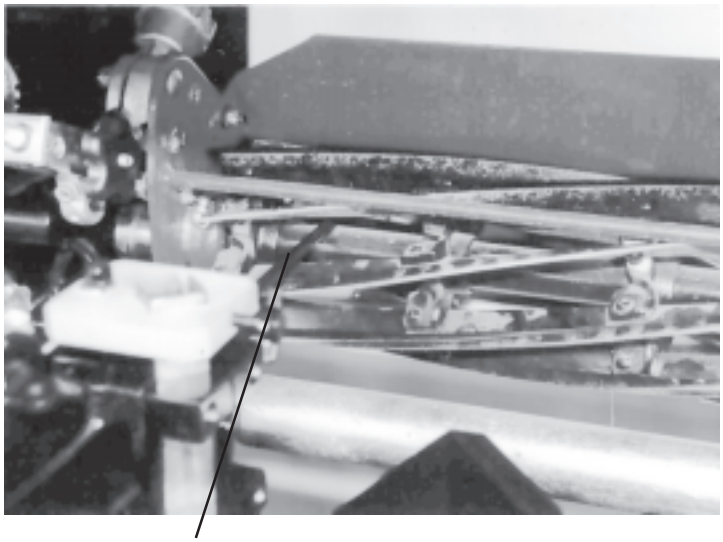


FIG. 42

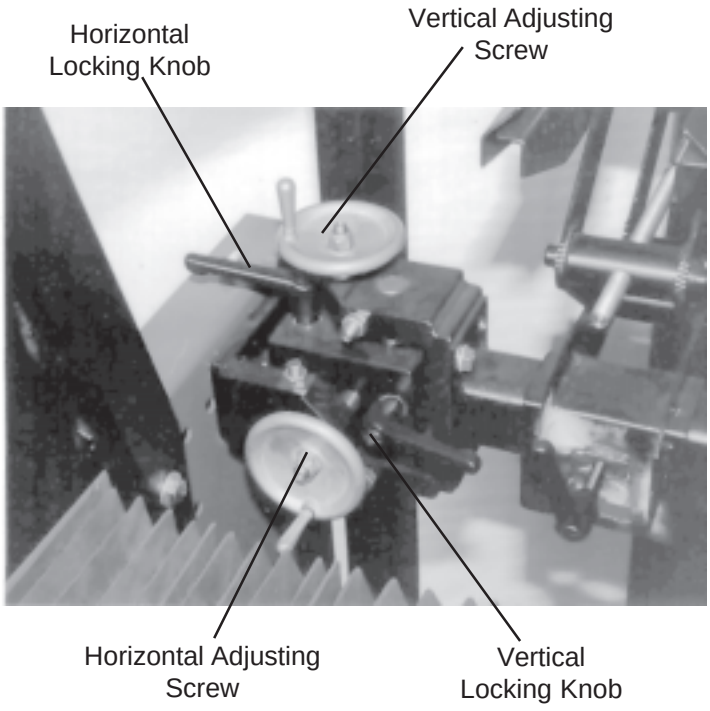


FIG. 43

OPERATING INSTRUCTIONS (Continued)

ALIGNING REELS IN THE HORIZONTAL PARALLELISM

THIS IS A CRITICAL SET UP AND CARE SHOULD BE TAKEN WHEN MAKING THESE ADJUSTMENTS. IF REEL IS OUT OF POSITION IN THE HORIZONTAL PLANE, IT WILL BE GROUND CONE SHAPED. SEE FIG. 48.

A. Move set up gauge on the right hand side of reel approximately 1" from the end. See FIG. 45.
B. Lower the indicator slide casting on the vertical support so the indicator rod can make contact with the center of the reel shaft within approximately 1/8" and lock Knob A. See FIG. 39. Center shaft should be clean and free of rust where rod makes contact. Now fine adjust using Knob B until at the center of the center shaft of the reel. See FIG. 41.
C. Now loosen Knob D on the indicator stop bar. Holding the indicator rod firmly against the reel shaft, move the indicator stop bar back, until no contact is made with the indicator rod plunger. Now move indicator stop bar forward until contact is made and then an additional 1/2". This will set the plunger at about its midpoint and allowing it to move in both directions. See FIG. 47.
D. Now set the outer dial indicator to the "0" position. Read and note the position of the smaller (.100) dial. You must know this reading when setting up the other side. Pull back and lock with Knob C. See FIG. 39.
E. Move the alignment gauge to the left side of the reel carefully retracting the indicator rod so as not to damage or change setting. Set indicator rod on the same position on the reel as on the other side, that is 1" from the end and centered on the shaft. See FIG. 46. Now read the dial indicator to determine the distance the reel is out of position.

NOTE: Because the set up gauge is mounted to the carriage, you can unlock the actuator drive system and traverse manually from end to end or you can use the auto traversing drive by setting the pot to a slower speed and powering from end to end.

When you pull the indictor rod back, there is a wing screw ("C") to snug up so you do not have to hold the rod in the back position.

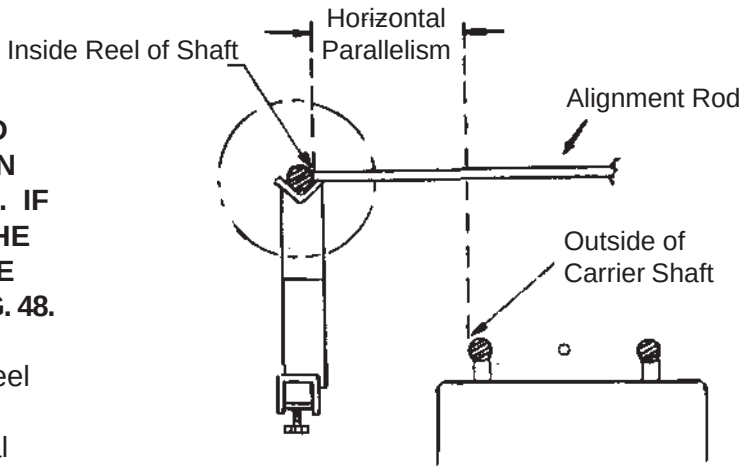


FIG. 44

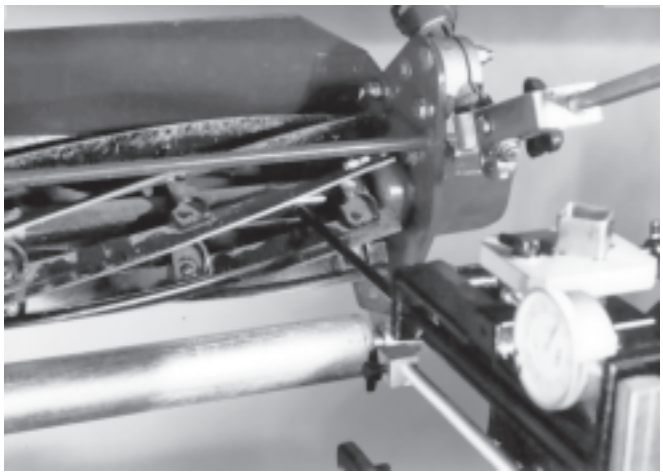


FIG. 45

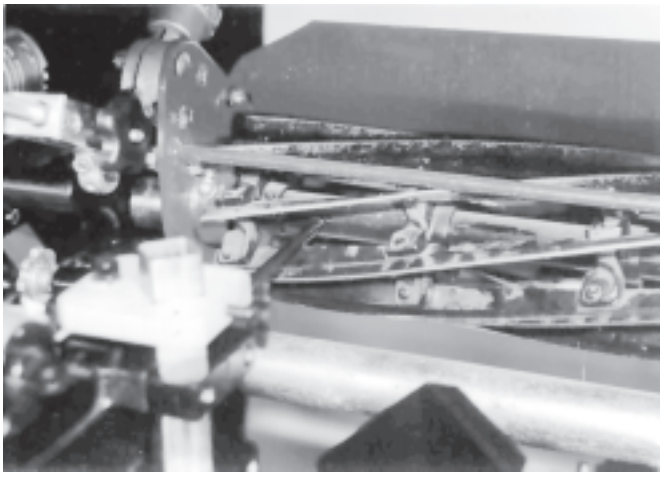


FIG. 46

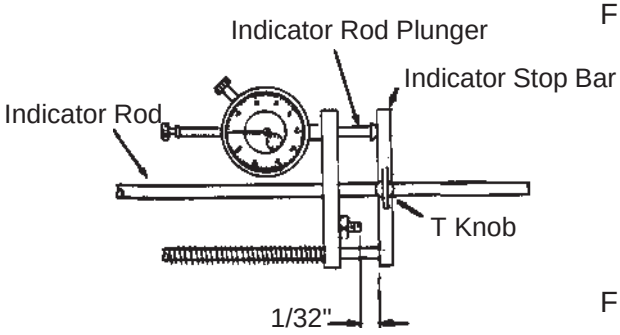


FIG. 47

ALIGNING REELS IN THE HORIZONTAL PARALLELISM (Continued)

F. To adjust reel position first determine the direction the reel has to move for alignment. The direction that the reel will have to be moved can be determined by pulling back on the dial indicator stop bar and if the dial moves back to the "0" position you will have to move the reel towards you. If that cannot be done the reel will have to be moved away from you.

There are two adjusting steps for final positioning of the reel as follows:

1. With the reel set gauge still in the left hand side of the reel, turn the horizontal adjusting screw (FIG. 43) in the direction required to match the initial indicator reading on the right hand reel position. See FIG. 46.
2. Now travel farther by half the amount already traveled.

The reason for this is that the square mounting bar pivots on one end and is adjusted on the opposite end. Anytime the adjusting end is moved to change the left side dimension, the right side dimension is also changing at a ratio to the left side. By over compensating at the adjusting end you will compensate for this movement and get the reel aligned much faster.

ALIGNING REELS IN THE HORIZONTAL PARALLELISM (Continued)

G. Now move the set up stand back to the right side of the reel. Set indicator rod on the same spot you used the first time and reset large dial on "0". Make sure you read the setting on the small scale and note. Then proceed with paragraph "E" & "F" again. This should give final adjustment. When you have done this procedure a few times you will find this procedure will become very easy.

IT IS ESSENTIAL THAT CARE IS TAKEN WHEN SETTING THE REEL UP IN THE HORIZONTAL POSITIONS IN ORDER TO GRIND IT INTO A CYLINDER SHAPE. ANY MISALIGNMENT WILL CAUSE YOU TO GRIND INTO A CONE. SEE FIG. 53.

I. When the horizontal parallelism has been adjusted to within .003" end to end, tighten the horizontal adjustment locking knob and both overhead clamp adjusting knobs. See FIG. 43. When tightening the knob it is very important that you have the dial indicator located at that side of the reel and watch it as you tighten. It must not move in the tightening process. After both knobs are tight, recheck alignment.

KNOBS CAN BE ADDITIONALLY TIGHTENED WITH AN ALLEN WRENCH TO INSURE MAXIMUM LOCKING POWER.

CHECKING REEL FOR CONE SHAPE, REEL ROUNDNESS, AND STRAIGHTNESS OF REEL OUTSIDE DIAMETER.

BEFORE GRINDING--

A. Before storing the set up gauge, it is very effective to use it to check the ungrounded reel to determine the amount the reel is conical in shape and which end has the larger diameter. See FIG. 48. Start with the set up gauge at the right end of the reel. Loosen the wing nut on the indicator stop bar, holding the indicator rod firmly against one blade. See FIG. 49. Pull the indicator stop bar back until it clears the plunger then advance it forward until it contacts the plunger and advances it 1/2 inch further. Lock in place. This sets the plunger at its midpoint and allows adequate movement in both directions. Set outer dial at zero and note position of pointer on small dial.

B. Now move it to the left side of reel and indicate the same blade. From the reading determine the amount the reel is cone shaped. This also determines high point for grinding. Grinding of a reel must always start at the high point.

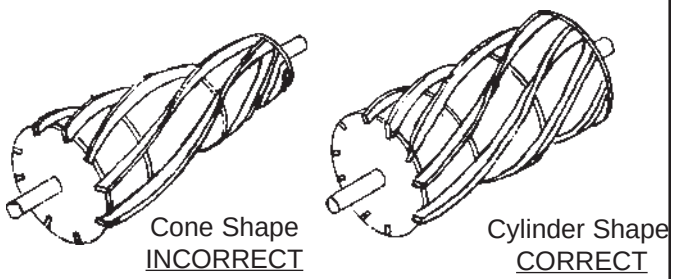


FIG. 48

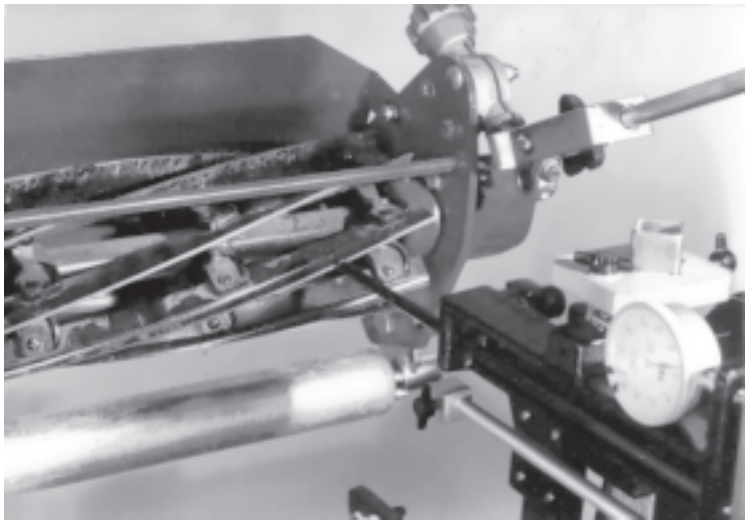


FIG. 49

AFTER GRINDING--

A. After grinding a reel, check the roundness on each end of the reel and center before removing ground reel. See FIG. 49. Loosen the wing nut on the indicator rod firmly against one blade. Pull the indicator stop bar back until there is a 1/32" gap between it and the set screw. This is to permit rotation of the reel blades to ride on the domed anvil only. See FIG. 50. At each location (left, right and center) turn the reel by hand and observe the indicator variations. All readings should be within .002".

B. Straightness of reel outside diameter--Take indicator readings at both ends of reel. Compare readings between each end of reel for straightness. All reading should be within .002".

C. Carefully remove dial set up stand and store in hole provided in end trays.

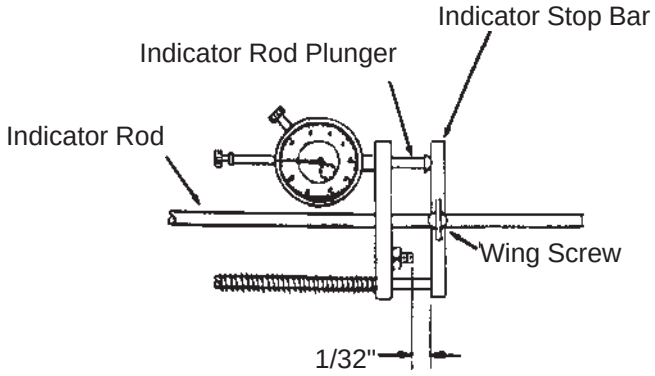


FIG. 50

SETUP PROCEDURE FOR SPIN DRIVE RPM VERSUS TRANSVERSE SPEED

SPIN DRIVE RPM

SPIN DRIVE RPM IS VERY IMPORTANT IN ACHIEVING A QUALITY GRIND. USE CARE IN ESTABLISHING THE SPIN DRIVE RPM, PER THE INSTRUCTIONS BELOW.

Generally, the Spin Drive RPM will be between 180 RPM (45%) and 380 RPM (100%). The speed required to spin a specific reel is dependant on reel diameter, the number of reel blades, and reel hardness. For all reels, there is an optimum Spin Speed where there is an **AGGRESSIVE**, yet smooth grind as you spin grind the reel. Your objective is to spin grind the reel as aggressively and as fast as possible while maintaining top quality.

It is recommended to start grinding each reel at a Spin Speed of 200 RPM (50%) and evaluate the RPM by adjusting higher and lower to optimize the Spin Speed for that reel. If the Spin Speed is incorrectly set, you can experience two problems, grinding wheel dressing or grinding wheel resonance. Each of these problems is explained below.

On some reels, especially small diameter high blade count reels if the Spin Speed RPM is set to high, the reel can act as a dresser to the grinding wheel. There can develop what appears to be a very aggressive grind (as if the infeed has self infed) and then a sudden stop of grinding with no grinding wheel to reel contact. If this occurs, your Spin Speed was set to high and you effectively dressed your grinding wheel.

Some reels have a resonant RPM where the reel goes into harmonics with the grinding wheel and the resonance vibrates the grinder and results in a very bad grind. By changing the Spin Speed to a higher or lower RPM you will move out of the resonant range.

After determining the best Spin Speed RPM for a reel, note the RPM on a "Set-up Chart" that you will make. By noting the correct RPM, you will avoid evaluating the Spin Speed the next time you grind the reel.

TRAVERSE DRIVE RPM

The Traverse Speed potentiometer is adjustable from approximately 5 feet per minute [1.5 meters per minute] to 35 feet per minute [10 meters per minute]. It is recommended to grind between 15 and 20 feet per minute [4 and 6 meters per minute].

Grinding at a slower traverse speed, 10 feet per minute [3 meters per minute] as an example, will give a better finish but will extend the grind cycle time. Grind finish versus grind cycle time is controlled by the choice of the operator.

GRINDING REEL INTO A TRUE CYLINDER BY SPIN GRINDING

A. Before you proceed any further, check all knobs to insure they are tight.

FIRMLY TIGHTEN ALL LOCKING KNOBS BEFORE GRINDING. ANY LOOSENESS WILL ADVERSELY AFFECT GRIND QUALITY. ALL KNOBS CAN BE ADDITIONALLY TIGHTENED WITH AN ALLEN WRENCH TO INSURE MAXIMUM LOCKING POWER.

B. There are three (3) hand knobs for locking the grinding wheel vertically. Two (2) on the base for the adjusting arm locks and one for grinding wheel vertical height adjustment locking screw.

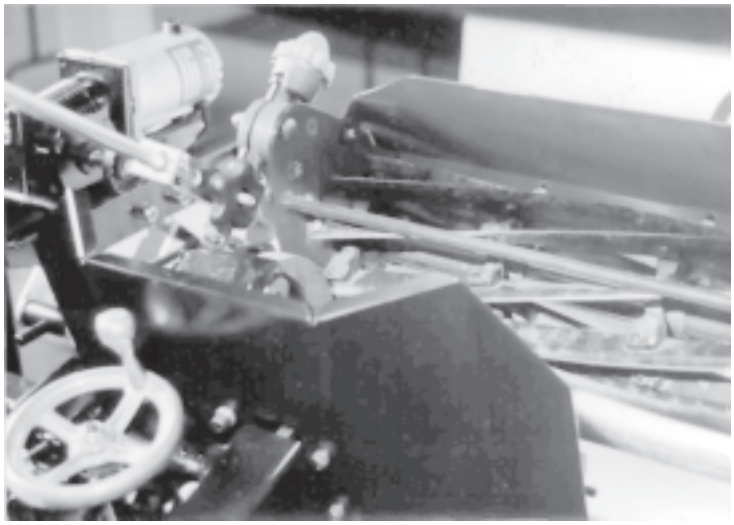


FIG. 52

WHEN SPIN GRINDING, THE POSITION OF FINGER IS ROTATED 180 DEGREES TO PROVIDE CLEARANCE WHILE GRINDING. SEE FIG. 53.

C. Position the height of the grinding wheel center so that it is 0 to 1" below the reel center. See FIG. 54. If the reel guide finger interferes, remove it.

D. Infeed the grinding wheel until it just makes contact with a reel blade and rotate the reel by hand to make sure the blades clear the stop finger. Now tighten the two locking knobs on the locking arms and the locking knob for the height adjustment screw.

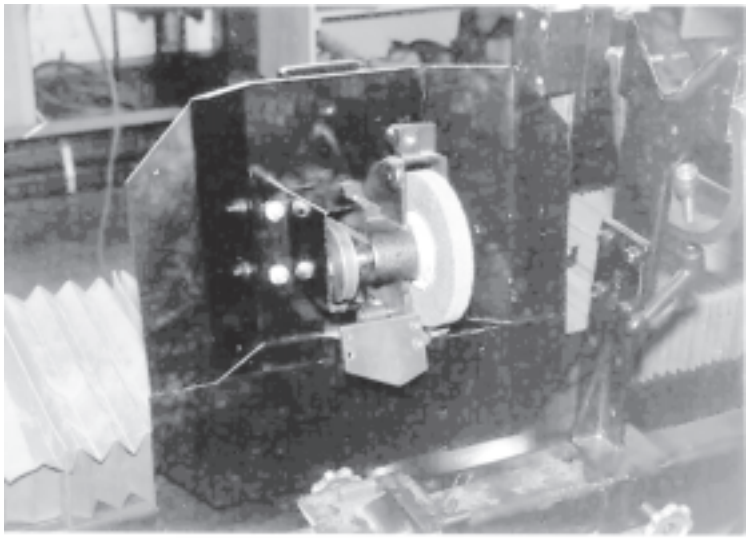


FIG. 53

THE ABOVE SECTION D MUST BE ACCOMPLISHED WITH THE MAIN POWER OFF.

IT IS CRITICAL THAT THE REEL BE HAND ROTATED TO VERIFY STOP FINGER CLEARANCE. FAILURE TO DO SO COULD CAUSE SIGNIFICANT DAMAGE TO THE REEL AND GRINDER AND POTENTIAL INJURY TO THE OPERATOR.

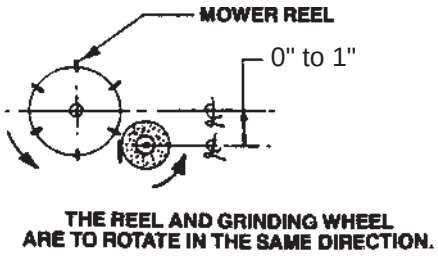


FIG. 54

GRINDING REEL INTO A TRUE CYLINDER BY SPIN GRINDING (Continued)

E. Move the grinding wheel back from the reel and frame so it will clear at all points. Set proximity stops so they line up approximately with the end of the frame and tighten them securely. Adjust the traverse speed knob to zero and turn traverse switch to on. Increase the traverse speed knob so the carriage will traverse slowly across the reel. See FIG. 55 & 56.

When the carriage has come to a momentary stop against proximity switch, turn traverse switch off. In this position, check to see that grinding wheel has cleared the end of the reel. If not, readjust stop so that this happens.

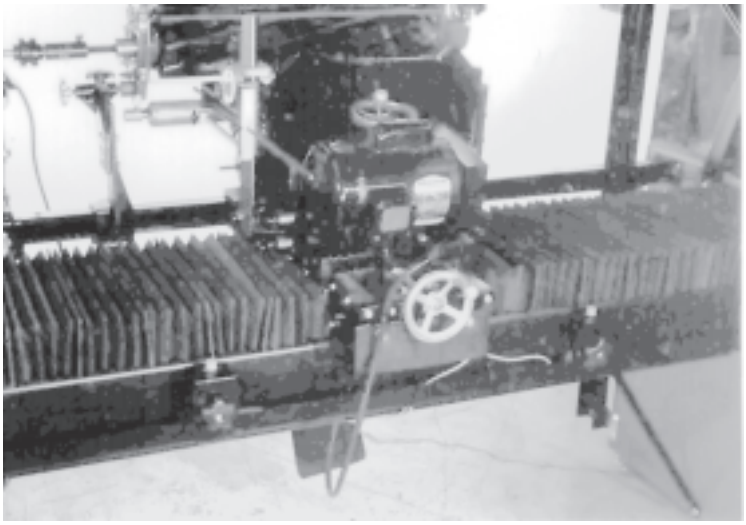


FIG. 55

CAUTION--IF THE REEL FRAME EXTENDS PAST THE REEL ITSELF, MAKE SURE THE STOP IS SET SO THAT THE GRINDING WHEEL WILL NOT RUN INTO FRAME WHEN GRINDING. IT IS POSSIBLE THAT IN SOME CASES THIS WILL MEAN THE GRINDING WHEEL WILL NOT CLEAR THE END OF THE REEL WHEN GRINDING.

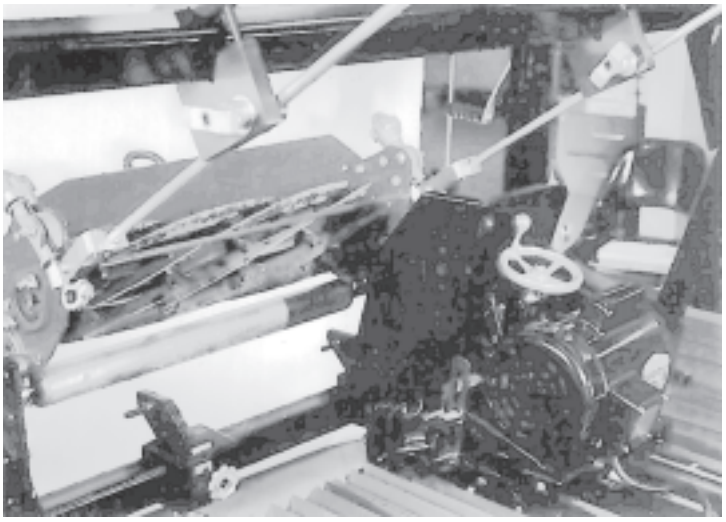


FIG. 56

F. Repeat this procedure for the other side of the reel and then set the traverse speed dial to "10" and let carriage traverse back and forth to make sure that the stops are set properly.

G. Move grinding carriage to the high side end of the reel and stop carriage.

H. Turn on spin drive motor and check to see if reel is spinning freely and that coupling components are properly aligned.

EXTREME CARE SHOULD BE TAKEN OF YOUR HANDS AND CLOTHING AROUND THE SPINNING REEL AND ROTATING COUPLER SHAFTS. AT NO TIME SHOULD REEL BE STARTED BY REVOLVING IT BY HAND.

I. Turn on grinding wheel motor on main control panel. Now slowly infeed the grinding wheel until it just make contact with the reel. See FIG. 57.

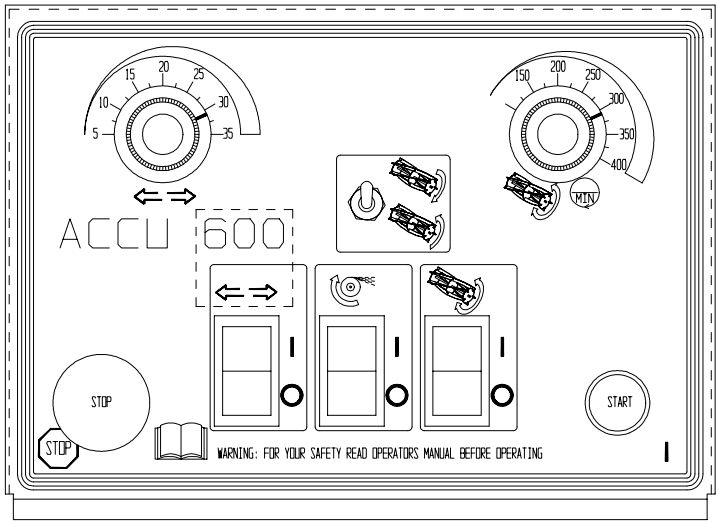


FIG. 57

GRINDING REEL INTO A TRUE CYLINDER BY SPIN GRINDING (Continued)

J. Set traverse speed knob to approximately "12", then turn on the traverse switch and begin grinding. If reel is in bad condition, traverse slower as more material can be moved. Conversely, if the reel is in good condition, speed can be increased.

MAXIMUM STOCK REMOVABLE PER PASS IS .008. NOTE: THE INFEED HANDLE IS CALIBRATED IN INCREMENTS OF .002 ON THE RING SCALE LOCATED ON THE INSIDE OF THE INFEED HANDLE.

K. If grinding wheel is only making contact in one position of the reel, adjust the traverse stop so the carriage traverses slightly further than the contacted area. As you infeed and wheel makes full contact in this area, move traverse stop away 6 to 8". This will speed up the grinding process of getting a cone shaped reel into a perfect cylinder. See FIG. 58.

L. Spin grinding is completed when full contact is made across the entire length of the reel and the entire width of all blades. It is required to have a sparkout to complete grinding the outside diameter to a true diameter. For sparking out, the process is to infeed the grinding head for approximately .002 stock removal (one line on the ring scale) and let the grinding wheel sparkout. For sparking out in grinding process, always traverse grinding head at least 20 passes with no grinding head infeed. Set traverse at slow speed on dial setting approximately 4 to 8 feet per minute range for final grinding sparkout. After sparkout, shut the grinder completely off.

NOTE: This process refers to sparkout, but what we are looking for is a near sparkout, approximately a 99% reduction in grinding sparks from normal grind. Do not run sparkout until you have no sparks because this could be an extremely extended period.

NOTE: Greatest accuracy and best finish is obtained when reel is sparked out.

Use your set up gauge, prior to relief grinding to check the reels for roundness. This is very important when first learning the operation of your machine. Refer to Page 26 for details on checking wheel roundness.

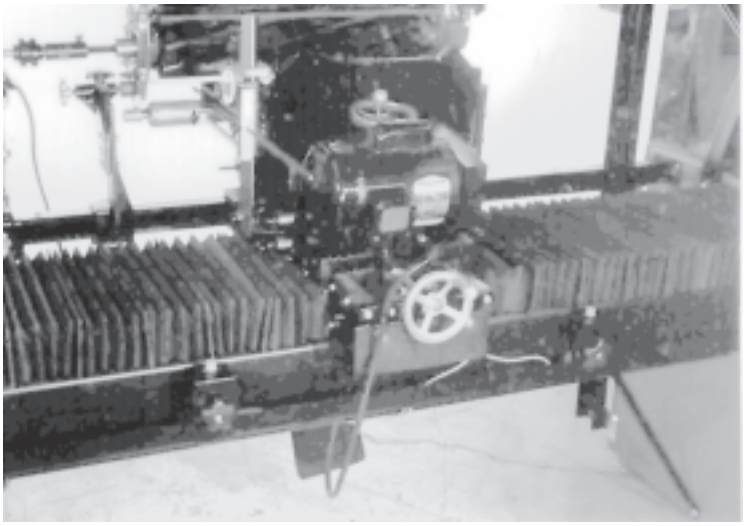


FIG. 58

Index reel blade until you read the high point on the indicator. Now loosen the wing screw and set the indicator stop block to a 1/32" gap as shown in FIG. 49 & 50.

Mark this blade as #1 and set the large dial of indicator setting to "0", then check each blade for maximum and minimum reading.

Check each end of reel and at the center. After becoming familiar with the process, you will not have to check each reel.

IT IS VERY IMPORTANT IN SPIN GRINDING THAT YOU THOROUGHLY SPARKOUT AT THE END OF THE GRIND CYCLE. THE DIFFERENCE OF ACHIEVING .005 OR .003 TOTAL READING IS ACCOMPLISHED WHEN NOT INFEEDING THE GRINDING WHEEL.

OPERATING INSTRUCTIONS (Continued)

REEL SPIRAL

When standing behind the mowing unit when the mowing unit is sitting in normal position on the ground. If the spiral is such that the right side of the blade cuts before the left, it is a right hand lead in or a right hand spiral reel. If the spiral is such that the left side of the blade cuts before the right it is a left hand lead in or left hand spiral reel. Most reels made today are right hand spiral.

RELIEF GRINDING TO COMPLETE THE REEL GRINDING PROCESS

A. Disconnect the spin drive coupling components from the reel and place in tool tray. Slide the spin motor back and attach the manual indexer. See FIG 62A.

B. Check to see if your mowing unit is a left hand or right hand spiral. See reel spiral definition above. **NOTE:** As you look into the guide finger in FIG. 60 it shows a reel with reverse helix reel spiral. The high point of finger guide is on the right hand side of the grinding wheel viewed from the finger mounted side. See FIG. 61 for standard helix. Most mowing units are standard helix so traverse your carriage to the right hand side of reel for starting position. Traverse carriage until there is at least .125 (1/8") clearance to the guide finger for indexing. See FIG. 62. Set the right hand traverse stop for this carriage reversing position. Traverse to the other end of the reel blade until the guide finger is beyond the point of grind by approximately .125 (1/8") to .75 (3/4"). Set the left hand traverse stop for this carriage reversing position.

C. There are three (3) hand knobs to loosen. Two (2) on the base for the adjusting arm locks and one for grinding wheel vertical height adjustment locking screw. Raise the grinding wheel up (approximately 7 turns) so the reel blade can rest on the reel guide finger. It will be necessary to infeed the grinding wheel to accomplish this. See FIG. 59.

D. Now you can adjust the back angle you wish to put on the reel blade. (The average recommended manufacturer's angle is 20 to 40 degrees. When in doubt, check with each reel manufacturer as to the exact angle required.) By looking down the reel from the operator's position you can see the reel and its relative position to the grinding wheel. By raising the grinding wheel you will decrease the back angle and conversely by lowering the grinding wheel you will increase the back relief angle. Traverse the grinding wheel assembly to the right side of the reel. Retighten all three (3) hand knobs.

SIDE VIEW OF GRINDING WHEEL

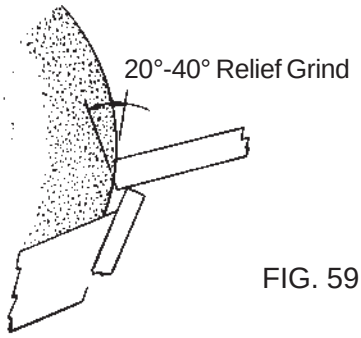


FIG. 59

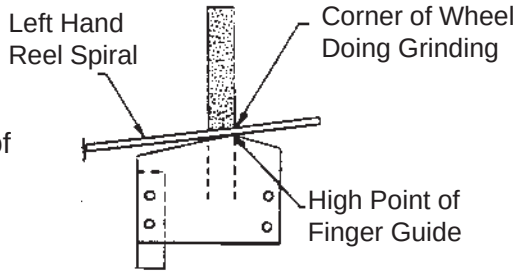


FIG. 60

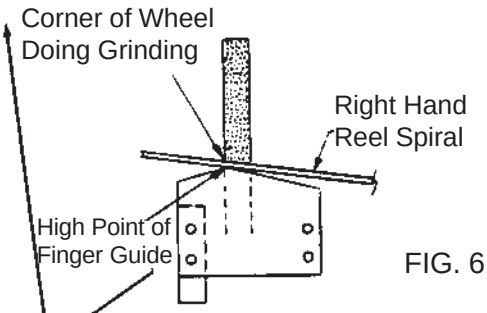


FIG. 61

LOOKING FROM THE REEL LOADING POSITION

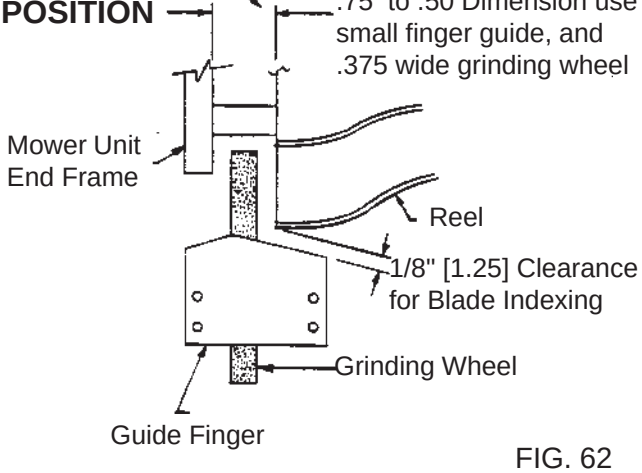


FIG. 62

REEL SPIRAL (Continued)

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. 60 & 61.

ROTATE FINGER GUIDE END FOR END WHEN REEL SPIRAL IS IN THE OPPOSITE DIRECTION AS SHOWN IN FIG. 60 & 61.

E. 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 the blade so that virtually no contact is made with the blade that is resting fully on the guide finger. Now with the grinding wheel NOT turning, turn on traverse motor and set at 6 and let grinding assembly traverse down. 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 using the manual indexer. This is a critical operation and should be well practiced prior to grinding. On the practice run you have to hold the reel against the finger on the return stroke using the manual indexer.

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

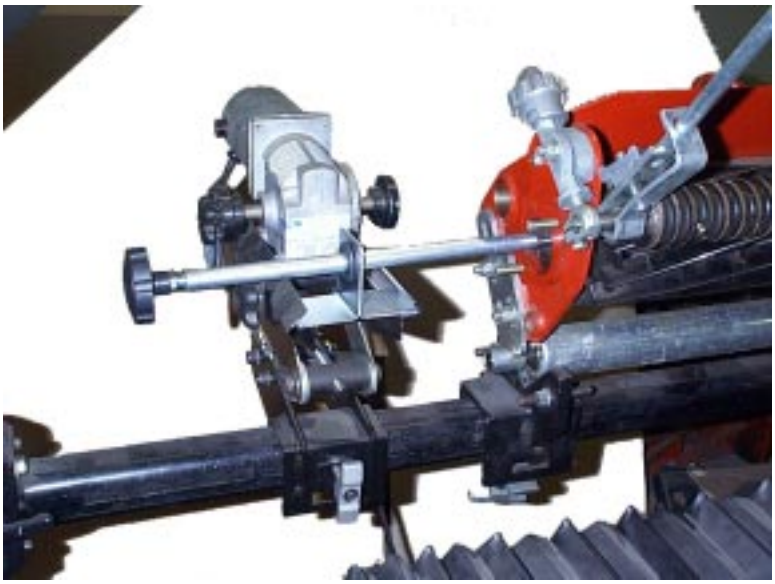


FIG. 62A

REEL SPIRAL (Continued)

When you are comfortable with this procedure, continue with the next step in actually grinding.

NOTE: At each end of the stroke when reversing, there must be a 1-second or longer pause. This can be increased. See control board settings in the adjustment section of the manual. The 1-second hesitation at the end of the stroke permits time to manually index the reel.

F. It is recommended that when the relief grinding is completed that 70% of the reel blade be removed. See FIG. 63. This will generally take up to three passes across each blade. At this time infeed the grinding wheel to take 1/3 to 1/2 relief grind. This amount will vary depending on the condition of the reel.
G. Mark the first blade with an "X" using a felt marker and with this reel blade resting on the finger guide but not making reel contact with the grinding wheel, set the traverse dial to "0", turn on the grinding wheel motor and traversing motor.
H. Hold the reel to the guide finger with the manual indexer and and turn the traverse speed to "6". As soon as the grinding wheel contacts the reel, remove your hand from the manual indexer. The guide finger will keep the blade in place as the grinding assembly traverses across the reel. When it reaches the left side of the reel the reel blade leaves the guide finger. The traverse switches will reverse the carriage direction to the opposite direction and the guide finger will automatically pick up the same reel blade and will be held down to the guide finger with the rotation of the grinding wheel.
I. Now continue grinding each blade by indexing them as practiced in procedure "E" until you have ground each blade down and back. When each blade has been ground inspect to see if proper relief has been attained. If not, reset wheel as in procedure "D" and regrind as before. Continue until you achieve the 70% relief. See FIG. 63.

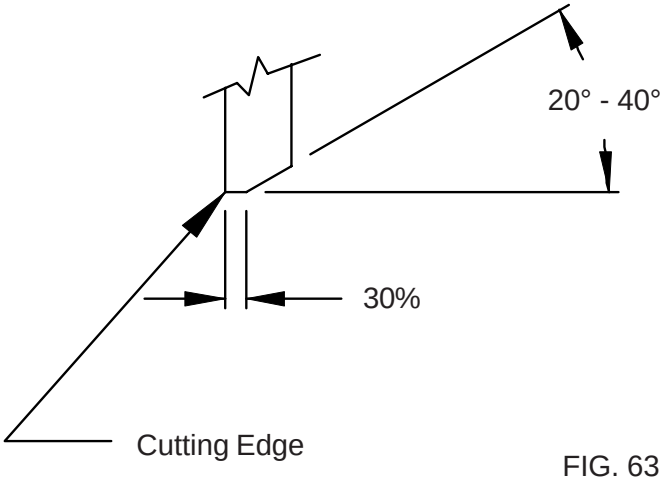


FIG. 63

REEL BLADE GRINDING WITH CLOSELY SPACED BLADES

A. If the reel blades are too close together or the clearance between mower unit is too narrow and will not permit you to use the large reel finger guide, it will be necessary to use the alternate stamped finger guide and a 3/8" wide grinding wheel (Part No. 3700363). See FIG. 62.
NOTE: This wheel is not included with the grinder.
In order to use this guide you will be required to dress the grinding wheel as follows: Place the guide finger on the grinding motor assembly and position about 1/16" away from the grinding wheel. On the normal helix reels, no dressing is required. See FIG. 64. On the reverse helix reels. See FIG. 65.
With the grinding wheel assembly in a position where you can reach it with the dressing stick, turn on the grinding wheel and dress the portion of the wheel at approximately 10 degrees. See FIG. 65.

B. The grinding procedures for using this finger will be the same as when using the larger guide finger, but because of its relative small size it is recommended that you index from blade to blade in the following manner: When grinding wheel assembly makes contact with the right traversing stop and pauses before reversing direction. Turn the traversing speed potentiometer knob to "0" this will stop the grinding head carriage. Now index the next blade and slowly increase the traverse speed potentiometer knob to move the grinding wheel into the reel while you position the blade onto the guide finger. Once finger is in place and grinding has started turn the speed dial to "6" and continue to grind as before. This procedure will be necessary for every blade.

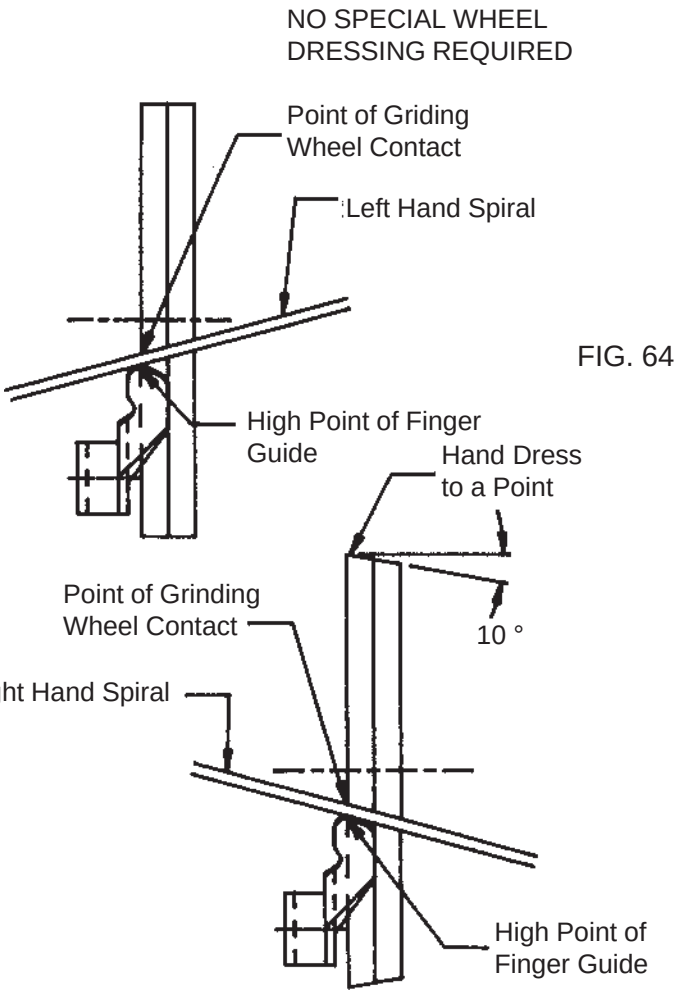


FIG. 64

FIG. 65

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