FOLEY UNITED

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

650
ACCU-Master
AUTOMATIC
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-Master AUTOMATIC 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.

6507920 (3-01)

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. Grinder is for indoor use only. Keep work area well lighted.
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 all switch are 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. **KNOW YOUR EQUIPMENT.** Read this manual carefully. Learn its application and limitations as well as specific potential hazards.
19. **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.
20. **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 BURNS.**
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.

TABLE OF CONTENTS

This machine is intended for grinding the reel of reel type mower units 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. Machine is for indoor use only. Do not powerwash machine.

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.

ADJUSTMENT OF THE LOW VOLTAGE RELAY MAY CAUSE ELECTRICAL COMPONENT FAILURE. ADJUSTMENT OF THE LOW VOLTAGE RELAY WILL VOID ALL ELECTRICAL COMPONENT WARRANTY.

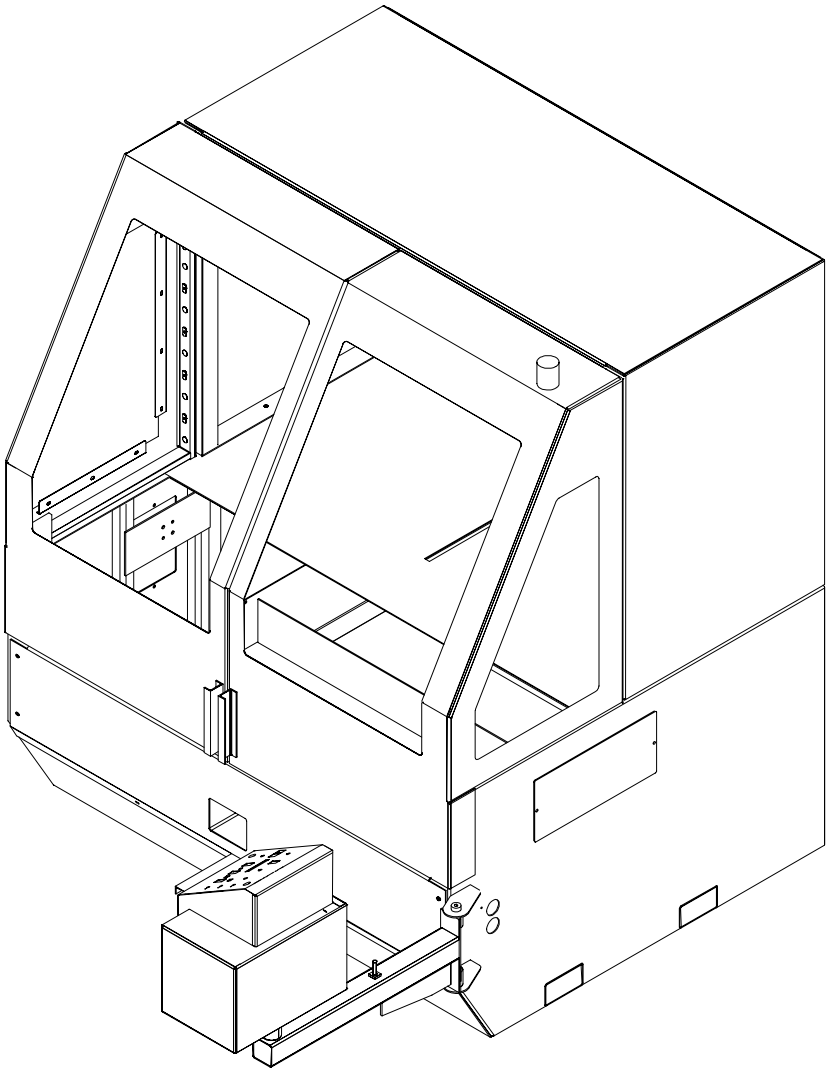
CONTENTS

DAILY MAINTENANCE BY THE OPERATOR

On a daily basis, clean the machine by wiping it off, and cleaning it using the built-in vacuum.
On a daily basis, remove all grinding grit from the grinding head and bellows area.
On a daily basis, inspect the machine for loose fasteners or components.
Contact your company's Maintenance Department if damaged or defective parts are found.

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

GETTING TO KNOW YOUR GRINDER



SPECIFICATIONS

Sound Level	Less than 75 Dba
Traversing Switches	Solid state, non-contacting proximity switches.
Carriage Travel	38" [97 cm]
Overall Width	71" closed [181 cm]
Overall Height	87" [221 cm]
Overall Depth	61" [155 cm]
Weight	2300 lbs. [1045 kg] 2500 lbs shipping weight [1140 kg]
Base Construction	Precision heavy duty reinforced welded steel base
Carriage Rails	Precision Ground, Hardened Steel - 1.000 Dia. [25.4 mm]
Grind Head Motor	1 HP DC Motor, 4300 RPM
Winch Capacity	400 lbs. maximum [180 kg]
Spin Motor	.20 HP Fan Cooled Variable Speed DC Motor
Auto Traverse	Ball bearing threadless roller drive with built-in overload protection
Rail Covers	Telescoping bellows
Control System	Safety power and main door interrupt switches

- Fully automatic cycle for Spin or Relief Grind.
- Reversible Spin drive for Spin or Relief Functions with manual (jog) functions for machine setup.
- Relief Blade count input thumbwheel.
- Solid state two speed manual (jog) infeed stepper functions.
- Solid State program logic controller with 16 inputs and 6 outputs.
- Permanent Memory stored programs on an E-Prom.
- 10 selectable grind program input thumbwheel with 5 spin grind and 5 relief grind programs.
- End of Cycle flashing light.
  Panel digital display for error, diagnostic or prompt messages.
- Solid State variable spin speed control, variable speed traverse control and grinding motor control.

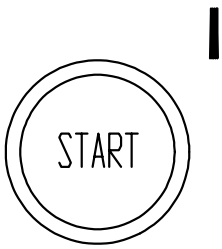
GETTING TO KNOW YOUR GRINDER (Continued)

CONTROL PANEL COMPONENT IDENTIFICATION

Review the following control panel component descriptions before proceeding with the instructions.

SYSTEM START SWITCH

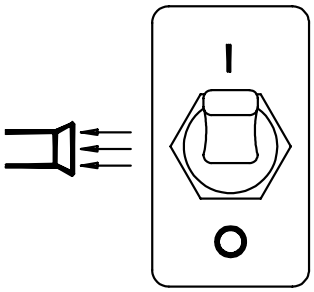
Powers all control panel systems.
Pulls in the main magnetic starter.



DUST COLLECTOR SWITCH

On / Off

Turns the dust collector on and off.



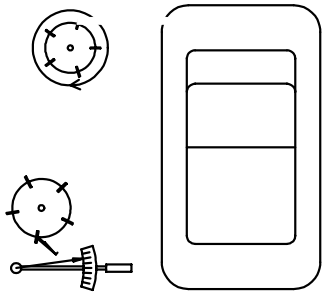
GRIND SELECTOR SWITCH

Variable speed spin

Switch must be up to perform spin grinding operations.

Variable Torque Relief

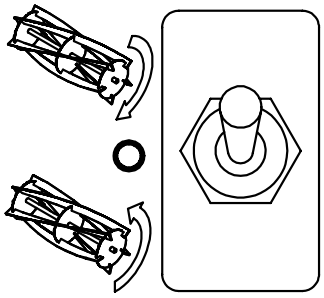
Switch must be down to perform relief grinding operations.



SPIN DRIVE ROTATION SWITCH

Forward / Reverse

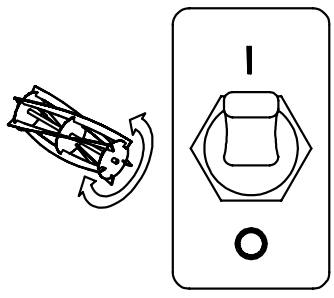
This switch reverses the spin drive motor.
(Toggle in middle is off position and stops rotation.)
NOTE: Because the spin drive motor can mount on either side of the reel rotation direction will vary.



SPIN DRIVE MOTOR SWITCH

On / Off

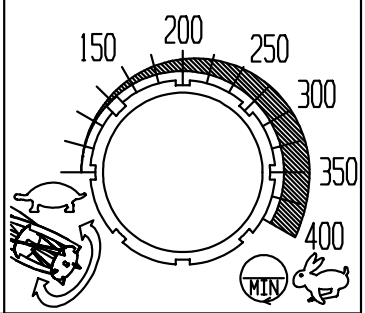
Turns the spin drive motor on and off.



GETTING TO KNOW YOUR GRINDER (Continued)

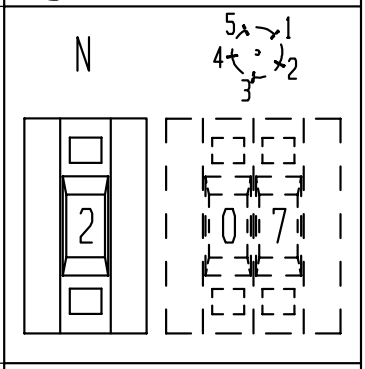
SPIN SPEED DIAL
RPM

Adjusts the speed of reel rotation when you have the grind selector switch set at variable speed spin.



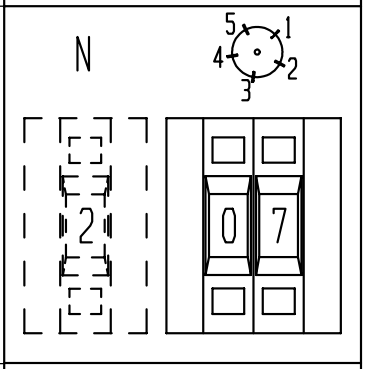
PROGRAM NO. INDICATOR

Selects automatic program number for both spin grinding (1-5) and relief grinding (6-0).



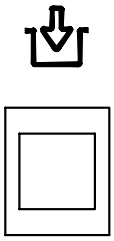
RELIEF BLADE NO. INDICATOR

Sets the number of blades on the reel for relief grinding only (4-11).



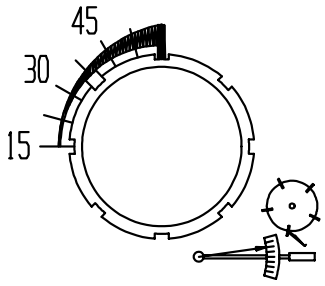
PROGRAM START SWITCH

Push this button to start grinding in an automatic program sequence.



RELIEF TORQUE DIAL

Adjusts the Spin Drive Motor torque (the torque holding the reel blade to the relief finger) when Grind Selector Switch is set at variable Torque Relief.



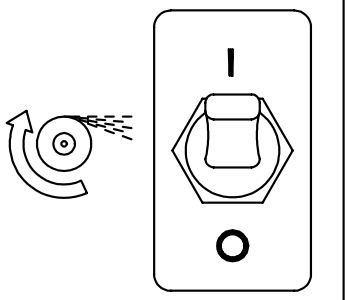
GETTING TO KNOW YOUR GRINDER (Continued)

GRINDING WHEEL MOTOR SWITCH

On / Off

Turns the Grinding Wheel Motor on and off.

NOTE: Grinding wheel motor will not function with the doors open.



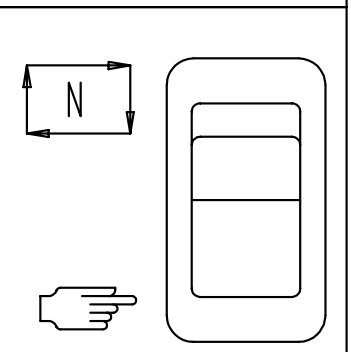
AUTO / MANUAL SELECTOR SWITCH

Auto Program

Switch must be up to start automatic program sequence.

Manual Jog

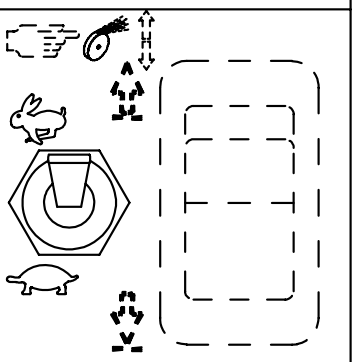
Switch must be down to use Infeed Jog Selector Switch & Traverse Jog Selector Switch during setup.



INFEED JOG SELECTOR

Slow/Fast

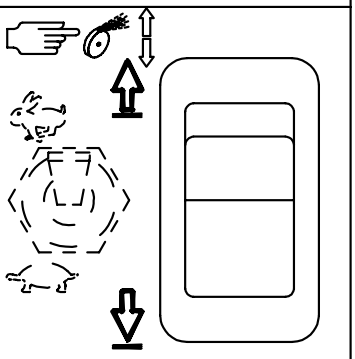
Switch up is fast infeed speed & switch down is slow infeed speed. Each bump of the AC Stepper Motor equals .0005" [.013 mm] movement. On slow the infeed moves 2 bumps or .001" [.03 mm] per second. On fast the infeed moves 34 bumps or .017" [.4 mm] per second.



INFEED JOG SELECTOR

Up / Down

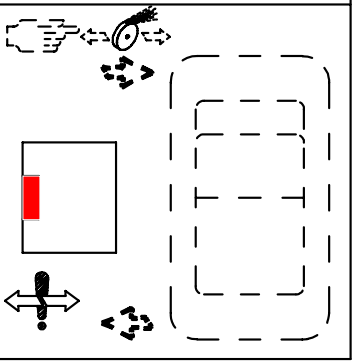
Moves the Grinding Wheel up or down. (Auto/Manual Selector Switch must be set at Manual Jog).



TRAVERSE JOG SELECTOR

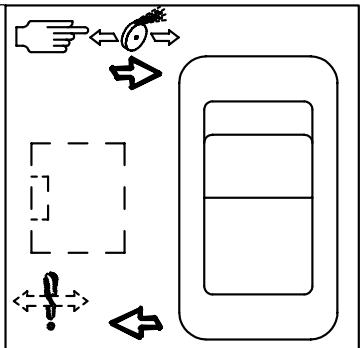
Reset

Resets Traverse Movement if safety overload switch trips. NOTE: Red light shows when overload has been tripped.



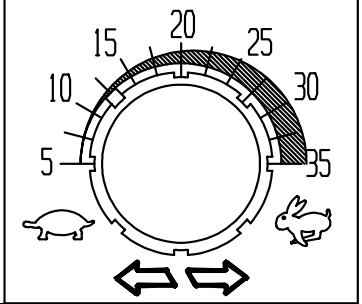
TRAVERSE JOG SELECTOR
Right / Left

Moves Grinding Wheel (Carriage) left & right (Auto/Manual Selector Switch must be set at Manual Jog.)



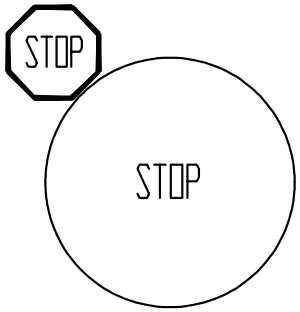
TRAVERSE SPEED DIAL - FT/MIN

Adjusts the speed of the left & right movement of the Grinding Wheel (Carriage) in both Auto program and Manual Jog.



EMERGENCY STOP BUTTON

Cuts all power to the control panel functions. Stops all motors, including grinding motor, traverse motor, infeed stepper motor, etc.



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

GETTING TO KNOW YOUR GRINDER (Continued)

FRONT AND REAR MOWER MOUNTING

The mowing unit is placed into the machine with the rear roller on the table and front roller held with the front tooling clamps. The front tooling clamps can be moved from side to side along the tooling bar so they can be positioned as far apart as possible on varying widths of reels (loosen knob on lower part of bar mounting bracket in FIG.1). You also have the ability to adjust the height (loosen knob on horizontal bracket in FIG.1) and the forward and backward position (loosen knob on roller clamp bracket in FIG1). This allows the mower unit to be set up with the bottom of the reel approximately flush to the table and the center of the reel aligned to the reel positioner gage (see section on reel positioner gage below). When the front tooling clamps and mower unit are in proper position lock in place by tightening knobs. The rear roller clamp is positioned with the V-clamp block centered on the rear roller. The height of the rear roller clamp can be adjusted down by simply pushing the unit down and adjusted up by first pulling up on the pony leafs and then sliding the unit up. To lock the front tooling clamps rotate the roller clamp up and lock in place with the quick release pin. Then turn the t-knobs clockwise until roller is firmly held in place. See FIG. 1.

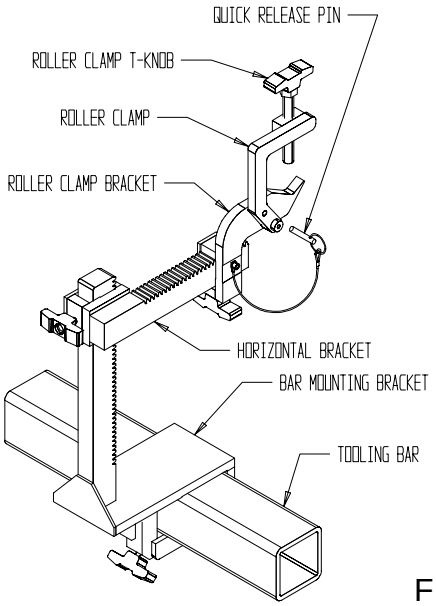


FIG. 1

REEL POSITIONER GAGE

The Reel Positioner Gage is used to obtain proper in and out (fore and aft) positioning of the mower unit. Mount the Reel Positioner Gage onto the table with the ears butted against gaging surface of the table. See FIG. 2. You then position the center of the reel within the slot in the Positioner Gage. This is an approximate starting point for setup purposes. There are special reels and unique situations that may require the reel to not be set on the center of the flag. This flag is for setup reference only.

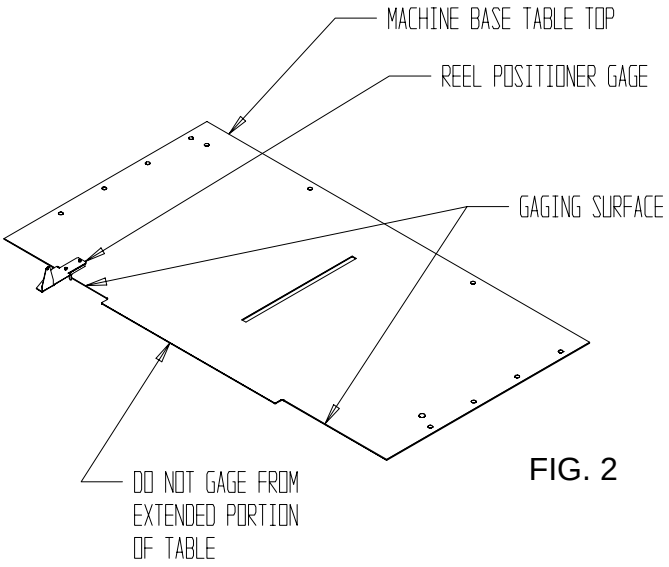


FIG. 2

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 Carriage Proximity Flag Bracket. See FIG. 3. Rotate the release arm clockwise approximately 1/2 turn to release actuator and counter clockwise approximately 1/2 turn to engage actuator.

GRINDING HEAD POSITIONS SPIN/RELIEF

The Finger and Body Assembly of the grinding head rotates on the Grinding Head Housing to change positions between spin grinding and relief grinding. To change the position of the Finger and Body Assembly you have to pull out the Plunger Pin on the left side of the Grinding Head Housing. See FIG. 5. When you are going to perform spin grinding operations the Finger and Body Assembly must be rotated clockwise (looking at it from the right). This rotates the fingers out of the reel blade path. See FIG. 5. When you are going to perform relief grinding operations the Finger and Body Assembly must be rotated counter clockwise. This rotates the finger into position to touch and control the reel blades. Because the Plunger Pin engages into the Adjustable Relief Adjuster and it sometimes will not fully engage, make certain it is fully engaged. See FIG. 6.

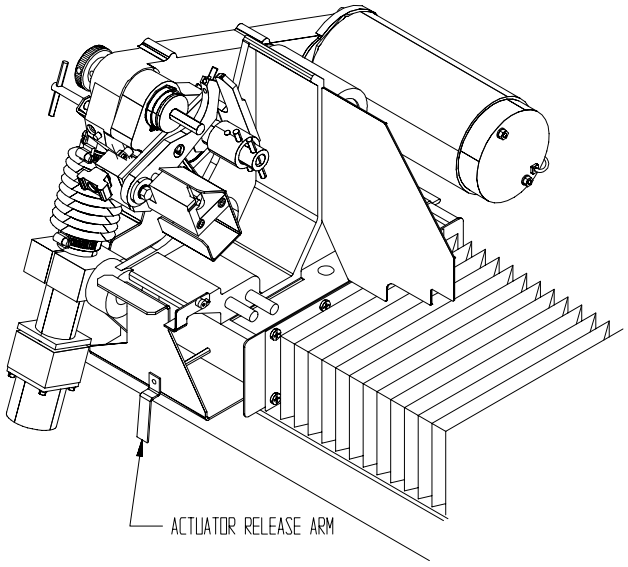


FIG. 3

GETTING TO KNOW YOUR GRINDER (Continued)

TRAVERSE PROXIMITY SENSORS

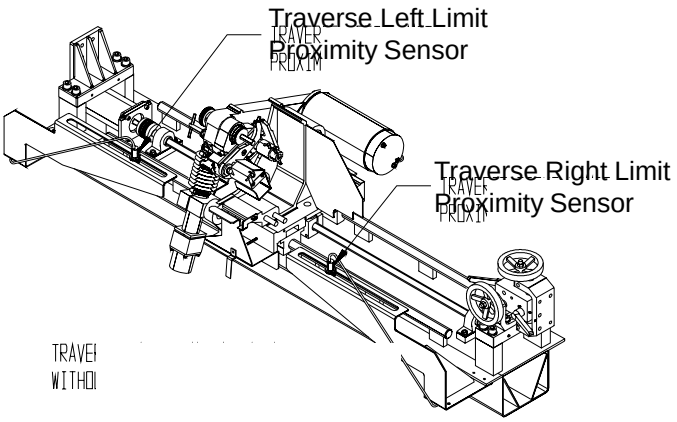
The Traverse Proximity Sensors are used to change the traversing directions for the grinding carriage and are mounted in the Proximity Brackets located in front of the Traverse Base. See FIG. 4. The sensors are mounted with wave washers to allow a left and right sliding movement without loosening the sensor nuts. There is a red light on the sensor which lights up when the switch is activated.

FIG. 5. The Fixed Relief Finger is equivalent to the Relief Fingers on other relief grinders. When relief grinding the Movable Index Stop Finger moves from the Relief Finger Side (back side) of the reel blade when traversing from right to left to the grinding wheel side (front side) of the reel blade when traversing from left to right. This feature allows the fully Automatic Relief function. When performing relief grinding operations it is important to have the Index Stop Finger adjusted properly.

STEP 1: Once you have the Grinding Head positioned with a reel blade resting on the Fixed Relief Finger high point, you want about 1/32" [.8 mm) to 1/16" [1.5 mm] free play of the Index Finger behind the reel blade. The Index Finger is spring loaded to the up position. To check free play, push down on the Index Finger. See FIG. 6. To make this adjustment you have to first turn the Index Lock Handle counter clockwise to unlock the adjustable Index Lever. See FIG. 6. If there is no free play of the Index Finger you want to rotate the Adjustable Index Lever clockwise. If there is more than 1/16" [1.5 mm] free play you want to rotate the Adjustable Index Lever counter clockwise. When the Index Finger is in proper position rotate the Index Lock Handle clockwise to lock the Adjustable Index Lever.

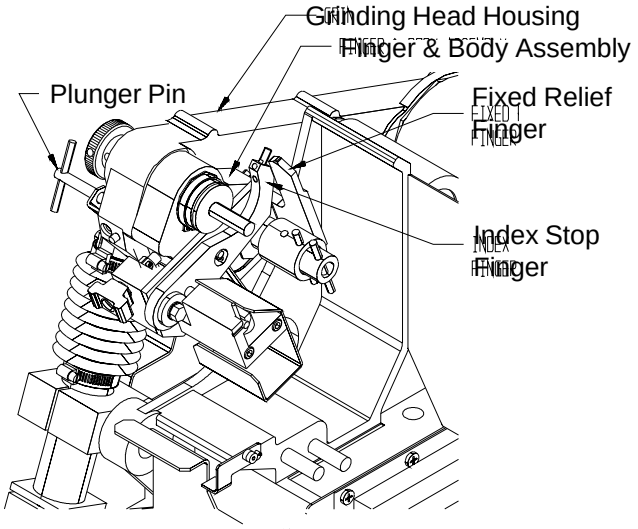
The Index Stop Pin is height adjustable. It should be adjusted to catch the reel blade and still leave enough clearance to the reel spider after the relief is ground to the depth required.

NOTE: The reason for the 1/32" (1 mm) clearance is so that the high point of the Relief Finger is acting as the guide during the relief grind cycle. The Index Stop Finger acts as a guide onto the tapered ramp of the Relief Finger.



Traverse Base standing alone
without dust protection components.

FIG. 4

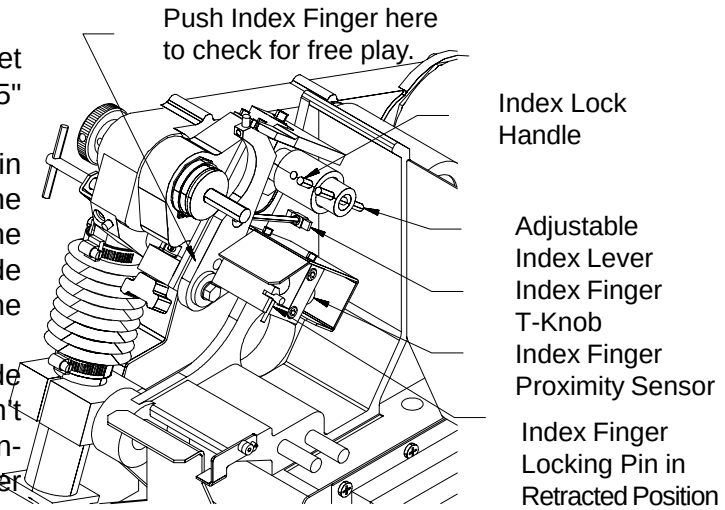


Detail shows Finger and Body Assembly rotated
(clockwise) into the spin grinding position
(shown without grinding wheel for clarity).

FIG. 5

GETTING TO KNOW YOUR GRINDER (Continued)

STEP 2: With the down limit of the Index Finger properly set you may have to adjust the up limit of the Index Finger for 5" (127 mm) diameter reels with reverse helix blades.
The up travel limit is restricted to keep the Index Finger in the reel blade index path. This is done to properly catch the next blade when indexing or to allow clearance between the back side of the Index Finger and the front side of the blade when the grinding carriage is making its return trip to the home position.
If the Index Finger has problems catching the next blade turn the Index Finger T-knob counterclockwise. If there isn't enough clearance between the back side of the Index Finger and the front side of the reel blade turn the Index Finger T-knob clockwise. See FIG. 6.
Adjust the T-knob in by 1/8" (3 mm) into the hole opening s the up travel is restricted. Check the up and down swing c the Index Finger for clearance on both sides of the reel blade for the relief grind.



Detail shows Finger and Bed Assembly rotated counterclockwise into relief grinding position (shown without grinding wheel for clarity).

FIG. 6

NOTE: This adjustment is factory set for maximum up travel of the index finger for 1/4" (6 mm) reel blade thickness. This adjustment should only be needed for small diameter reels, such as 5" [127 mm] diameter reels with reverse helix blades. This adjustment is functional only on cutting units with thin blades on small reels.

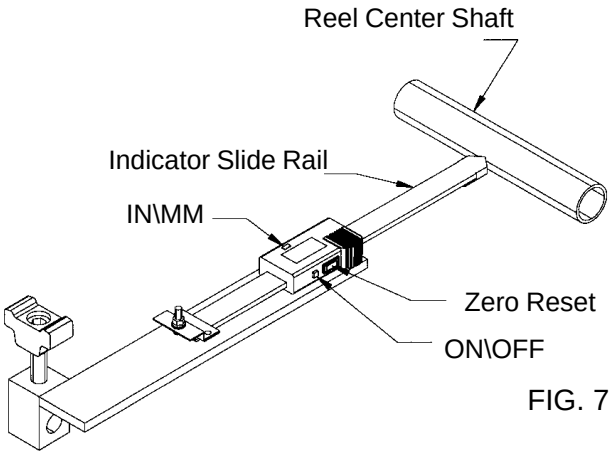


FIG. 7

ALIGNMENT GAGE

A properly grounded reel should be cylindrical. all taper must be ground out of the reel. To ensure te reel will be ground correctly it MUST be aligned precisely prior to grinding. The digital alignment gage is used for accurate reel setup. The same gage is used for setting both the horizontal and vertical alignment within thousands of an inch. The digital gage allows you to measure one end of the reel by extending the slide rail until you make contact with center hub of the reel by extending the slide rail until you make contact with the center hub of the reel. See FIG> 7. You then reset the gage to zero, retract the slide rail and measure the other end of the reel. The reading on the digital scale tells you exactly how far out of alignment you are. NOTE: Gage can be set for both inch and metric readout.

DUST COLLECTOR
The dust collector unit is used during grinding operations to collect the majority of the grinding dust directly under the grinding wheel. Since the dust collector unit is actually and industrial vacuum you can disconnect the vacuum hose from the carriage base and use the vacuum to clean the entire machine. See FIG. 8.

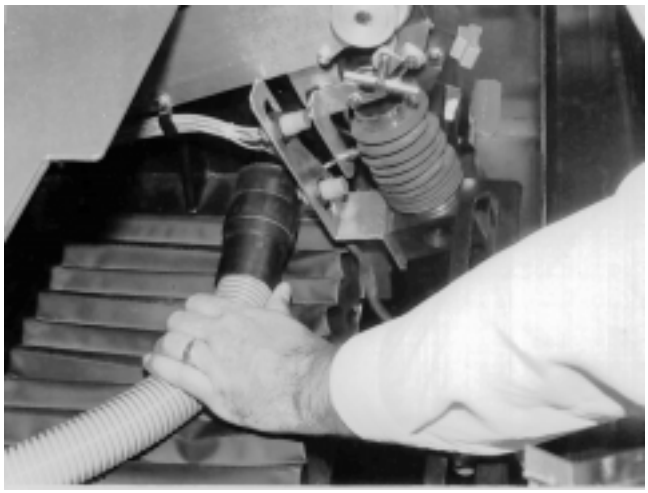


FIG. 8

NEVER USE COMPRESSED AIR TO CLEAN ANY AREA OF THE MACHINE.

MACHINE SERVICE LIGHT

The machine service light is mounted under the right side proximity bracket and the switch is located to the front of the machine base on the right side panel. The service light is independent of grinding operation so it can be on or off at any time. See FIG. 10.

NOTE:
There is also a light switch on the back of the light unit.

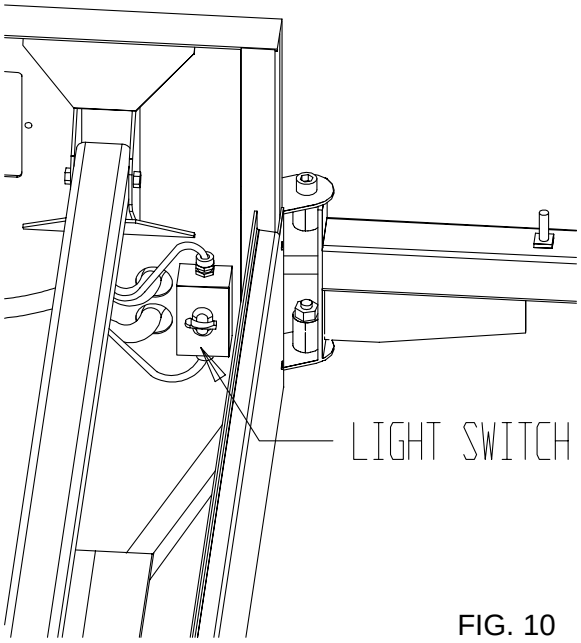


FIG. 10

RELIEF ANGLE ADJUSTMENT

You should always make sure the Reel Positioner Adjuster is at its mid point before you set up a reel to grind. This will allow to adjust the relief angle by approximately 8 degrees in both directions. You can find the mid point by turning the Reel Positioner Adjuster clockwise, using the 5/16" Allen Key included with the grinder, until it makes contact with the stop pin. Then turn the Reel Positioner Adjuster counterclockwise until it makes contact with the stop plate counting the number of revolutions. Now turn the Reel Positioner Adjuster clockwise again 1/2 the number of revolutions you counted.

As an example, if the angle you obtain from initial set up is 30 degrees, you can increase the angle as far as approximately 38 degrees by rotating the Reel Positioner Adjuster clockwise until it makes contact with the stop pin. (NOTE: If 38 degrees is not enough relief angle you can move the reel forward one notch on the front tooling horizontal bracket. Make sure you reset the Reel Positioner Adjuster to the mid point again before you move the reel, and always realign reel if it is moved. You can decrease the angle as far as approximately 22 degrees by rotating the Reel Positioner Adjuster counterclockwise until it make contact with the stop plate. (NOTE: If 22 degrees is still to much relief angle, you can move the reel back one notch on the front tooling horizontal bracket.)

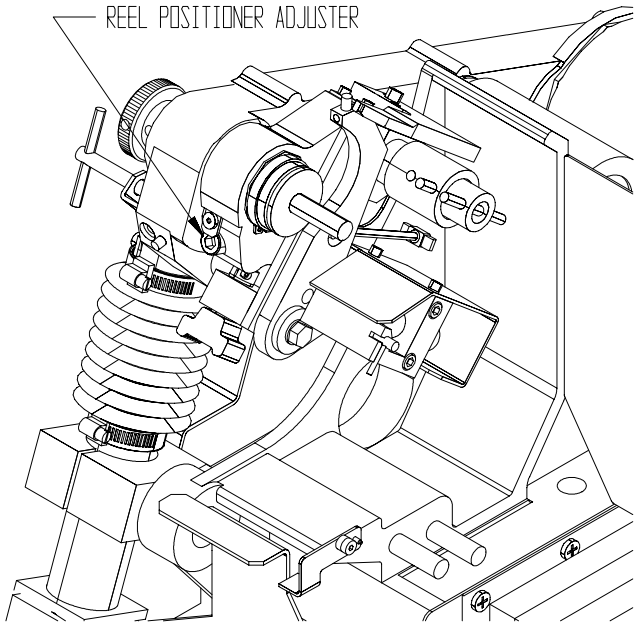


FIG. 10A

SAFETY INSTRUCTIONS

Safety Awareness Symbols are inserted in this manual to alert you to possible Safety Hazards. Whenever you see these symbols, heed 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.

PLEASE TAKE SPECIAL NOTE OF THE FOLLOWING WARNING DECALS LOCATED ON THE FRONT OF THE GRINDER, THE WINCH BOOM AND THE FRONT TOOLING BAR OF THE *ACCU*-Master.

WARNING

THIS GRINDER OPERATES WITH A LARGE AMOUNT OF HOT SPARKS, WHEN GRINDING A UNIT WITH A FUEL TANK, MAKE CERTAIN THERE IS NO EXPOSED FUEL AND THAT THE GAS CAP IS TIGHT AND THE VENT TAPED SHUT. CLOSE DOORS AND LATCH PRIOR TO GRINDING IN AUTO PROGRAM OR MANUAL JOG CYCLE.

WARNING

WINCH IS FOR LIFTING CUTTING UNITS ONLY. DO NOT USE FOR ANY OTHER PURPOSE.

ALWAYS HAVE LIFTING HOOKS SECURELY ATTACHED AND BALANCED BEFORE LIFTING.

STAND WELL CLEAR OF THE CUTTING UNIT WHEN LIFTING. GUIDE THE CUTTING UNIT WITH EXTENDED ARMS ONLY.

WINCH CAPACITY IS 400 LBS. MAXIMUM.

READ THE WARNINGS IN THE WINCH SECTION OF THE ASSEMBLY AND OPERATING MANUAL BEFORE USING THE WINCH.

WARNING

FOR YOUR OWN SAFETY READ ASSEMBLY AND OPERATING MANUAL BEFORE OPERATING

1. ALWAYS USE SAFETY GLASSES.

2. DO NOT WEAR GLOVES, NECKTIES, LOOSE CLOTHING, ETC.

3. THIS MACHINE OPERATES WITH A LARGE AMOUNT OF HOT SPARKS, WHEN GRINDING A UNIT WITH A FUEL TANK, MAKE CERTAIN THERE IS NO EXPOSED FUEL AND THAT THE GAS CAP IS TIGHT WITH THE VENT TAPED SHUT.

4. STAY CLEAR OF GRINDING WHEEL CONTACT AREA WHEN IN MANUAL JOG CYCLE. ALWAYS STAY CLEAR OF ALL ROTATING AND MOVING PARTS WHEN IN MANUAL JOG CYCLE.

5. ONLY PROPERLY TRAINED PERSONNEL SHOULD OPERATE THE MACHINE. KEEP ALL VISITORS A SAFE DISTANCE FROM THE MACHINE WHEN IN MANUAL JOG CYCLE.

6. BE CERTAIN THAT THE CUTTING UNIT IS SECURELY FASTENED WITH THE CLAMPS PROVIDED BEFORE OPERATING.

7. DO NOT EXCEED MAXIMUM OPERATING SPEED MARKED ON THE GRINDING WHEEL. (READ GRINDING WHEEL SAFETY SECTION IN YOUR MANUAL BEFORE GRINDING).

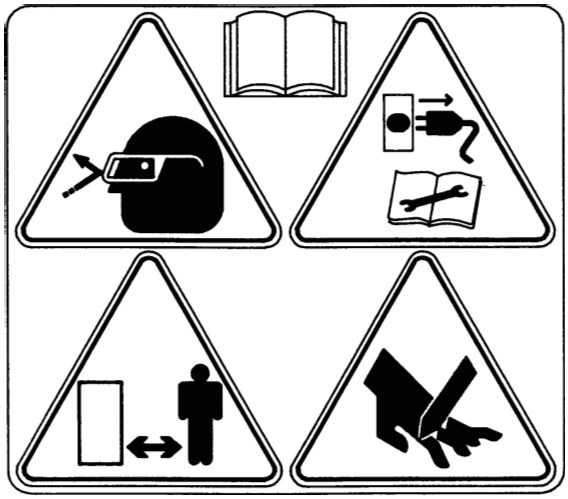
8. DISCONNECT YOUR MACHINE FROM THE MAIN POWER SOURCE BEFORE PERFORMING ANY MECHANICAL OR ELECTRICAL SERVICING.

9. KEEP ALL GUARDS IN PLACE AND IN GOOD REPAIR.

10. BEFORE OPERATING INSPECT THE MACHINE FOR LOOSE, DAMAGED OR MISSING PARTS. IF FOUND, REPAIR OR REPLACE. REMOVE ALL TOOLS FROM OPERATING AREA.

11. CLOSE DOORS AND LATCH PRIOR TO GRINDING IN AUTO PROGRAM OR MANUAL JOG CYCLE.

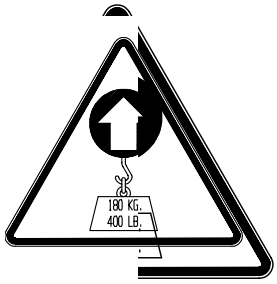
--SEE MANUAL FOR PROPER GRINDING INSTRUCTIONS--



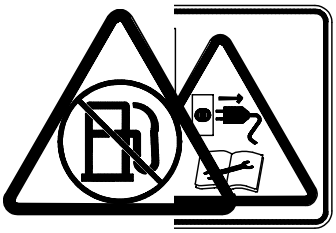
Symbols for Read operators manual, wear safety glasses and disconnect power before servicing.

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

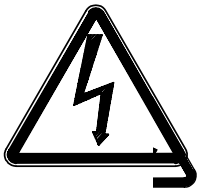
Symbol for sharp object which will cause serious injury.



Symbol for maximum weight capacity for winch.



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



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.

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WINCH OPERATING INSTRUCTIONS

Read carefully before attempting to operate or service your winch! Failure to comply with instructions could result in personal injury and/or property damage!

FOR YOUR OWN SAFETY AND THAT OF OTHERS, THIS EQUIPMENT MUST BE USED AS RECOMMENDED BY THE MANUFACTURER. FAILURE TO HEED THE FOLLOWING RECOMMENDATIONS COULD ENDANGER YOUR LIFE.

1. Maximum pulling capacity is 400 pounds (180 kg.) in single line operation. **DO NOT ATTEMPT TO MOVE LOADS GREATER THAN THESE RATINGS.**

2. **NEVER CARRY** personnel on the hook or the load.

3. **NEVER MOVE A LOAD** with this winch until all personnel are clear.

4. **NEVER HOOK THE WIRE ROPE BACK ON ITSELF. USE THE SPREADER BAR ASSEMBLY.** Hooking the wire rope back on itself creates an unacceptable strain on the wire rope.

5. **DO NOT ALLOW** unqualified personnel to operate this unit.

6. **KEEP CLEAR OF WINCH WIRE ROPE AND HOOK WHEN OPERATING WINCH. DO NOT ATTEMPT** to guide wire rope by hand as it rewinds.

7. **DO NOT** use the wire rope as a ground for welding.

8. **NEVER TOUCH** a welding electrode to the wire rope.

9. **WHEN SPREADER BAR ASSEMBLY IS USED** be sure it is properly seated in the saddle of the hook.

10. **AVOID** excessive inching and quick reversals of load.

11. **BE SURE** that the power supply is disconnected before performing maintenance and repair procedure.

12. **DO NOT OPERATE** this unit if it is not functioning properly.

13. **MAINTAIN A MINIMUM OF 4 TURNS OF WIRE ROPE** around the winch drum to prevent the wire rope from pulling off under load.

14. **KEEP WINCHING AREA CLEAR**. Do not allow people to remain in the winching area. Do not stand between the winch and load.

15. **INSPECT WIRE ROPE FREQUENTLY**. A frayed wire rope with broken strands should be replaced immediately. Never replace the wire rope with rope of any kind or with wire rope other than the type and size specified in the repair parts section of this manual.

16. **USE HEAVY LEATHER GLOVES** when handling the wire rope to eliminate the possibility of cuts or scratches from burrs and slivers from broken strands.

17. **ALLOW WINCH TO COOL DOWN FREQUENTLY**, as the motor is designed for intermittent duty only. When the metal motor housing is hot to touch, it is time to let the winch cool down

18. **DO NOT OPERATE WINCH WHEN UNDER THE INFLUENCE OF DRUGS, ALCOHOL, OR MEDICATION.**

19. **DO NOT USE WINCH TO HOLD LOADS IN PLACE**. Use other means of securing loads, such as tie down straps.

20. **USE ONLY FACTORY APPROVED SWITCHES, REMOTE CONTROLS AND ACCESSORIES**. Use of non-factory approved components may cause injury or property damage and could void your warranty.

21. **DO NOT MACHINE OR WELD ANY PART OF THE WINCH**. Such alterations may weaken the structural integrity of the winch and could void your warranty.

22. **DO NOT OPERATE THIS WINCH OUT DOORS OR IN A CORROSIVE OR EXPLOSIVE ENVIRONMENT**.

WINCH OPERATING INSTRUCTIONS (Continued)

This unit is activated via the switch at the end of the one foot cord. To remove wire rope from the winch, depress the "CABLE OUT" button. The load will stop without coasting when the button is released. To pull a load or spool wire rope onto the drum, depress the "CABLE IN" button.

This winch is designed to pull 400 lbs (180 KG) in single line for 20 seconds "on" time on the wire rope layer closest to the drum. Attempts to pull more than this weight or exceed the duty cycle may cause damage to the winch or wire rope and could cause the circuit breaker to trip, and the winch will not operate. (See "Trouble Shooting" section for instruction on resetting the circuit breaker.) Maintain a minimum of four wraps of wire rope around the winch drum before attempting any pulls.

DO NOT put angular loads on the winch. Whenever possible, pull should always be perpendicular to winch.

Keep wire rope tight and even on spool.

Replace wire rope when frayed.

Keep wire rope under tension when operating winch. Wire rope will "stack up" loosely on spool if not kept under tension.

A part of your winch that will require periodic attention and eventual replacement is the wire rope. Inspect the wire rope frequently. If fraying exists, replace the wire rope at once. Your winch uses galvanized aircraft type 1/8" DIA. [3 mm] 7 x 19 cable. Always replace the wire rope with the replacement rope specified in the parts section of this manual. Because all rope is subject to wear, it is excluded from our warranty.

LUBRICATION

Your new winch has lifetime lubrication. There may be grease leakage out of the winch, especially during the first few operations, this is normal. It is not necessary to grease or oil any part of the winch at any time. If grease leakage continues beyond a short period of time, the winch should be inspected for cause. See the Assembly and Service Manual.

TROUBLESHOOTING

If the Superwinch fails to operate, the circuit breaker on the end of the Superwinch motor should be checked. If the circuit breaker has tripped, this will be indicated by the center portion of the breaker protruding from the main body. To reset the breaker, merely press the center portion back into the assembly.

NOTE: Repeated tripping of the breaker indicates an overload condition which should be eliminated immediately to insure maximum life from your winch.

OPERATING INSTRUCTIONS

PREPARE MOWING UNIT FOR SHARPENING

When preparing a cutting unit for sharpening, follow the cutting unit manufacturers recommendations for proper maintenance. 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.

Because this grinder mounts the reel using the reel roller, and front roller if applicable, the bearings must be in good repair with no freeplay. **The front and rear rollers must be properly aligned parallel to the reel prior to grinding.**

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.

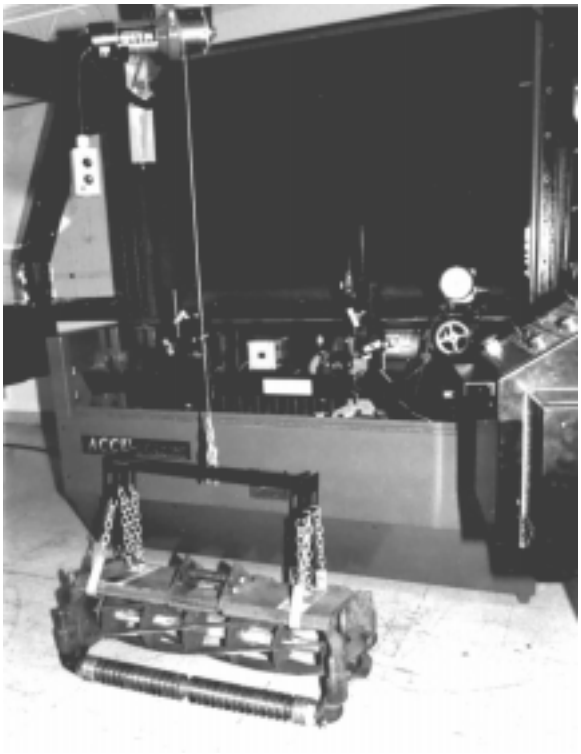


FIG. 11

LIFTING REEL INTO POSITION

Position the mowing unit in front of the grinder on the floor so the front of the mowing unit faces forward. See FIG. 11. Hook the winch 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.

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.

SEE WINCH SAFETY WARNINGS AND INSTRUCTIONS ON PAGE 16 AND 17.

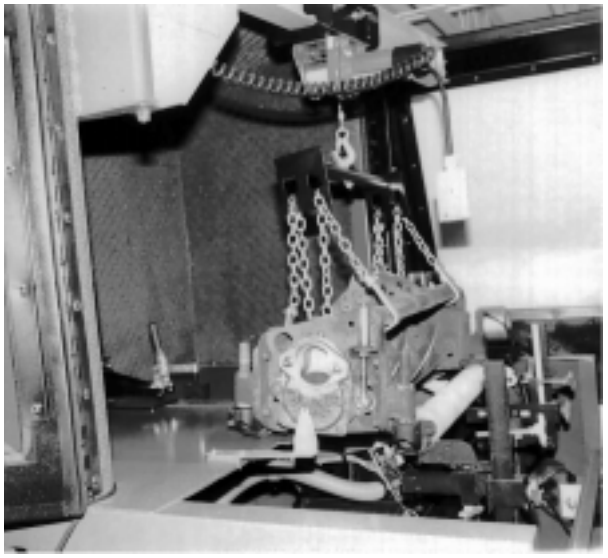


FIG. 12

INSTALL REEL

Use the winch to lift the reel to the approximate position, having the rear roller on the table top, and front roller on front roller clamps. See FIG. 12.

MAKE SURE GRINDING WHEEL IS LOW ENOUGH TO CLEAR THE REEL. YOU CAN LOWER THE GRINDING WHEEL BY SETTING THE AUTO/MANUAL SELECTOR TO MANUAL JOG AND DEPRESSING THE INFEED JOG BUTTON DOWN.

Position front roller clamps as far out as possible to the ends of the front roller, and center on the machine. See FIG. 12

Set the vertical height of the front clamps so the reel bottom is flush to 3/8" [10 mm] above the table surface. See FIG. 13.

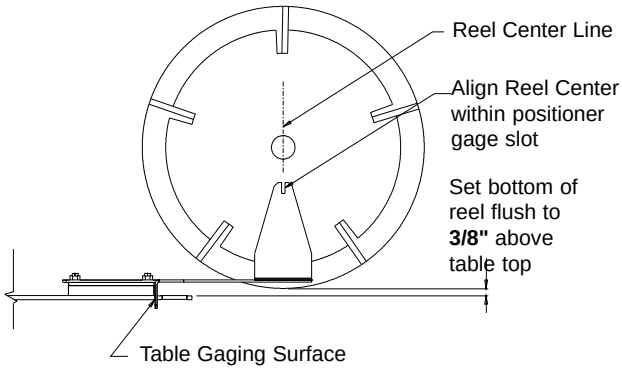


FIG. 13

Set the fore and aft position of the front clamps with the reel Positioning Gage. Place the reel positioner gage against gaging surface. See FIG. 14. You want to align the center of the reel within the slot of the positioner gage.

THE HORIZONTAL SCALES AND VERTICAL TOOLING SCALES MUST MATCH FOR PROPER ALIGNMENT.

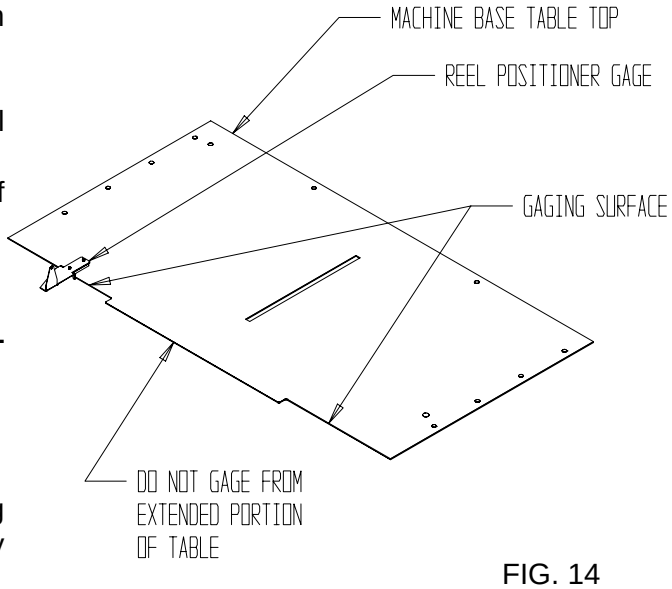


FIG. 14

For greensmower reels, the 4" [102 mm] diameter grinding wheel must clear the front roller V-bracket by approximately 1/4" [6 mm]. **REFER TO PAGE 35 FOR SETUP CHART.**

Make certain the reel is parallel to the front edge of the table. Lock down with front clamps and rear clamp. See FIG. 15 &16.

FIRMLY TIGHTEN ALL LOCKING KNOBS BEFORE GRINDING. ANY LOOSENESS WILL ADVERSELY AFFECT GRINDING QUALITY.

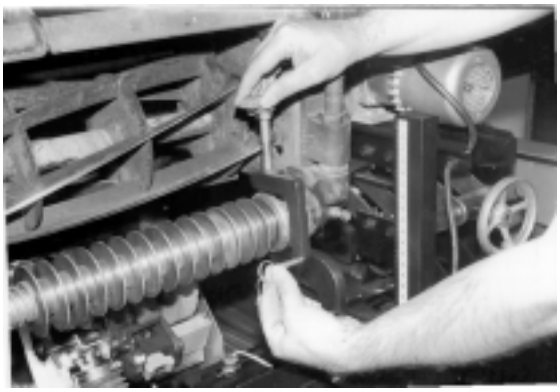


FIG. 15

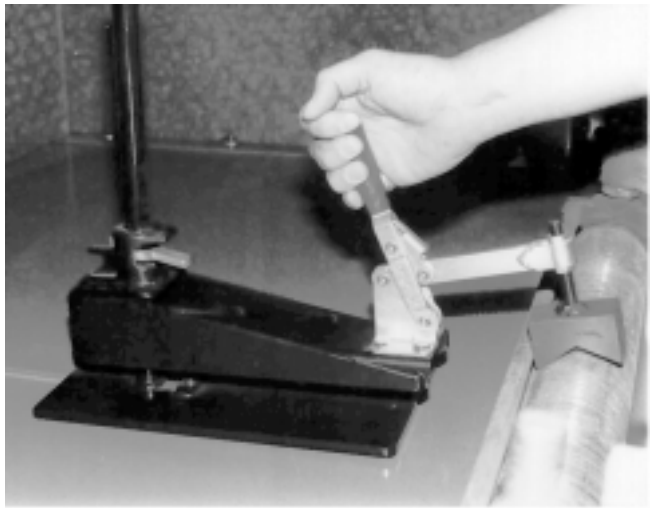


FIG. 16

OPERATING INSTRUCTIONS (Continued)

ALIGN THE REEL

Note: When measuring to the reel center shaft always make sure you are contacting an area free of dirt and grass.

Install the horizontal extension bracket onto the carriage front dowel pin and lock in place with knob. See FIG. 17.

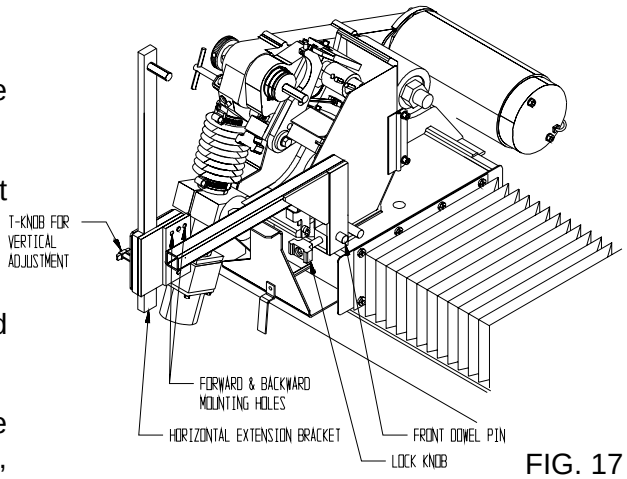


FIG. 17

Install the digital alignment gage onto the horizontal extension bracket pointing at the center of the reel shaft and lock into place with knob. See FIG. 18.

NOTE: The horizontal extension bracket is vertically adjustable so the digital gage can be positioned to avoid reel frame members, etc. The mounting of the vertical slide to the horizontal weldment has two additional mounting holes so the vertical slide can be tipped forward or back, again to avoid reel frame members, etc. See FIG. 17.

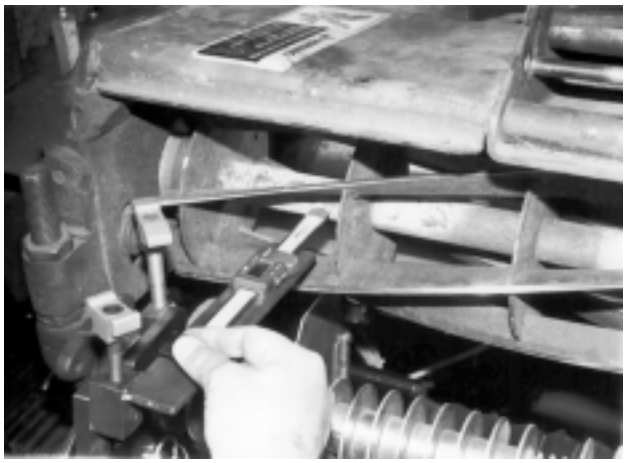


FIG. 18

Loosen the two locking handles on the pivot assembly on the right side of the traverse base, so that it can be adjusted in both the vertical and horizontal plane. See FIG. 19.

First, measure the left side of the reel as far to the left as possible with the digital alignment gages, making sure the tip of the gage is centered on the reel center shaft. Set the gage to zero, then measure the right side at the same distance from reel centerline as the left side. Do not rotate the reel shaft except for a minimum amount to clear the gage when taking measurements. Adjust the horizontal handwheel See FIG. 19. Repeat until alignment is within .002" [.05 mm]. Lock the horizontal locking handle when done.

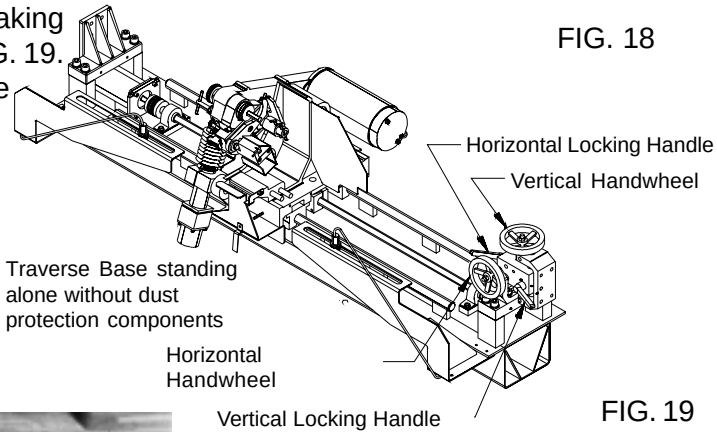


FIG. 19

Remove the gage.

Remove the horizontal extension bracket and store it on the mount inside the canopy.

Install the digital alignment gage vertically on the carriage front dowel pin and pointing at the center of the reel shaft. Lock into place with knob. See FIG. 20 & 22.

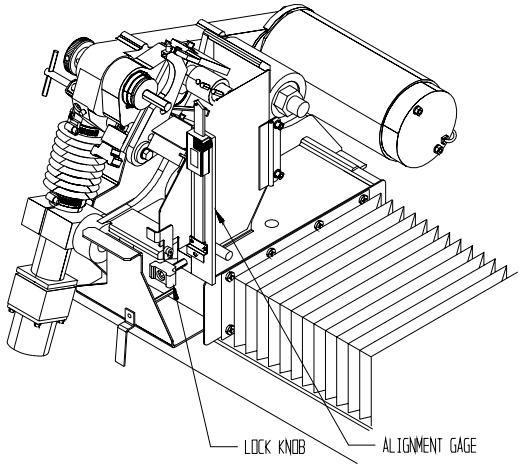


FIG. 20

First, measure the left side of the reel as far to the left as possible, set the gage to zero, then measure the right side, at the same distance from reel centerline as the left side. See FIG. 21. Do not rotate the reel shaft except for a minimum amount to clear the gage when taking measurements. Adjust the vertical handwheel. See FIG. 19. Repeat until alignment is within .002" [.05 mm]. Lock the vertical locking handle when done.

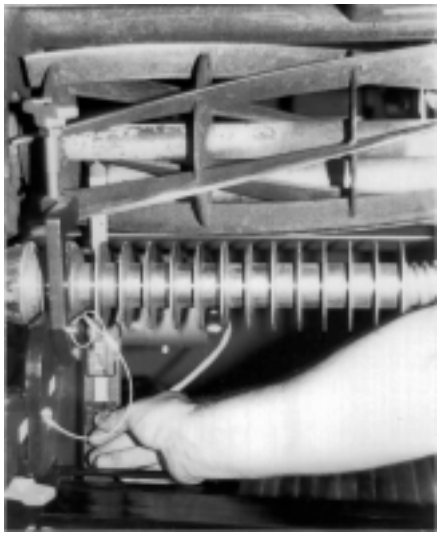


FIG. 21

ATTACHING THE VARIABLE SPEED SPIN DRIVE UNIT TO THE REEL

The spin drive unit attaches to the end of the reel shaft or a drive system component. Consult the cutting unit manufacturer for proper spin drive placement and attachment. Determine which side to mount the spin drive. This will generally be the same drive system component used for backlapping. See FIG. 22.

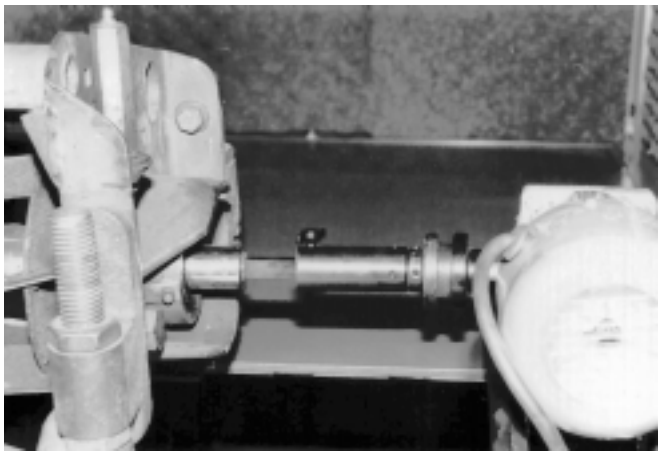


FIG. 22

Attach the spin drive unit onto the appropriate side.

When spin grinding, the reel should turn in the same direction as the grinding wheel. See FIG. 23.

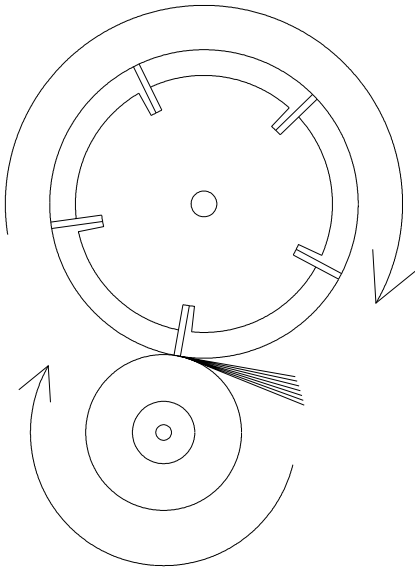


FIG. 23

Before positioning the spin drive unit let us familiarize ourselves with the available adjustments and coupler/drive assemblies. See FIG. 24.

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.

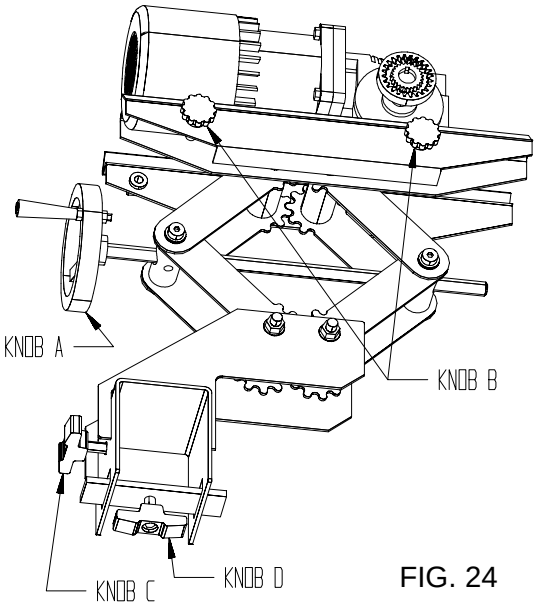


FIG. 24

OPERATING INSTRUCTIONS (Continued)

The coupler/drive assembly includes:

RUBBER SLEEVE COUPLER: This is placed in the corresponding flange coupler already mounted in the spin drive shaft. See FIG. 25.

DRIVE COUPLER ADAPTER ASSEMBLY: This is mounted to the rubber coupler.

ADAPTER SLEEVE: Connects the rubber coupler to the square drive adapter.

SQUARE DRIVE ADAPTER: This is inserted into the drive coupler adapter and should be able to be moved approximately 2" [51 mm]. 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 the reel without extending past this groove, then the spin unit must be repositioned on the tooling bar (knobs C & D).

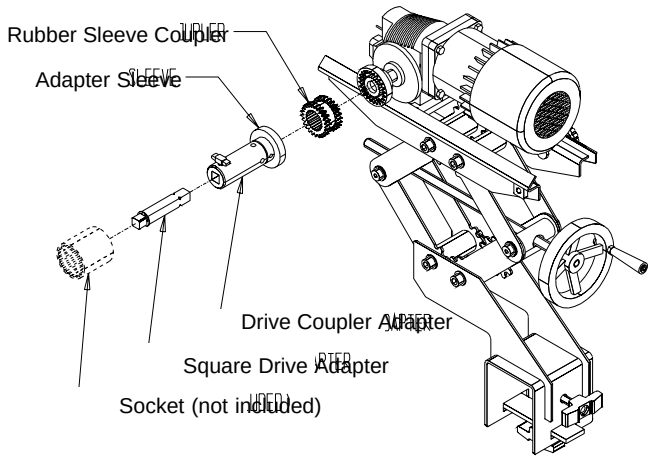


FIG. 25

NOTE: The 1/2" square drive socket that is placed on the reel when spin grinding is ***NOT*** included with the grinder. You must purchase this from the appropriate local supplier of tools. Some mowing units do not have a hex to use for driving with a socket. Several adapters are available from the grinder manufacturer. Additionally, you will have to make custom adapters for some mowing units.

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

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 nut on reel by completing the necessary adjustments discussed on the previous page.
2. Now slide the spin drive unit approximately 7" [18 cm] from the reel drive coupling point and securely fasten to the square mounting bar tightening both locking knobs. (Knobs C & D)
3. Place the proper 1/2" square drive socket or adapter 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. 22.
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 T-Knob on the adapter sleeve to hold all parts in place.
5. Finally readjust 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.

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 the "Set-up Chart" in the "NOTES" section. See page 38. 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.

VERIFY GRINDING WHEEL TO REEL END FRAME CLEARANCE

Install the 5" [127 mm] x 1" [25 mm] grinding wheel. Adjust the relief finger with the front hand knob so it clears the grinding wheel diameter (about 1/32" [0.8 mm]). Turn knob clockwise to move finger out and counter clockwise to move finger in. See FIG. 27.

NOTE: The 3.5" x 1" [89 mm x 25 mm] grinding wheel may be required for smaller reels, such as 5" [127 mm] diameter greensmowers, if clearance is required.

Pull the left side Plunger Pin and rotate the Finger and Body Assembly down (forward toward the operator) to the spin position until the left side plunger pin locks into position. See FIG. 28.

Position the index finger down and locked (pin in), with right side locking index finger pin. See FIG. 28

Move the grinding wheel up to within at least 1/8" [3 mm] of reel by depressing the Infeed Jog button up.

Move the Traverse Travel Limit switches out to allow the grinding wheel to reach the end of the reel. See FIG. 29. Depress the Traverse Jog button left and right to move the grinding wheel until it has cleared the end of the reel (if clearance to the frame allows). When grinding wheel is in position, move the Traverse Travel Limit switches in until the red light on the proximity switch lights. Move grinding wheel in a couple of inches and then back out to verify switch properly stops grinding wheel.

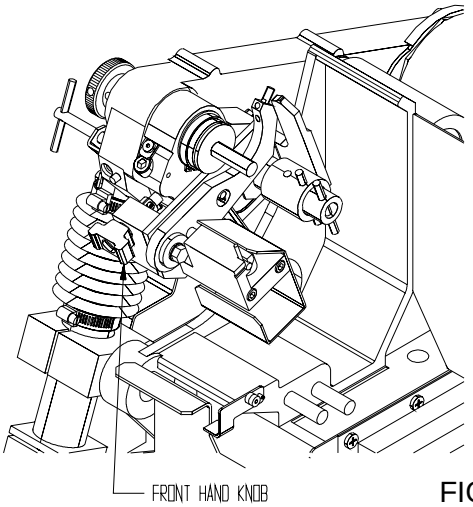
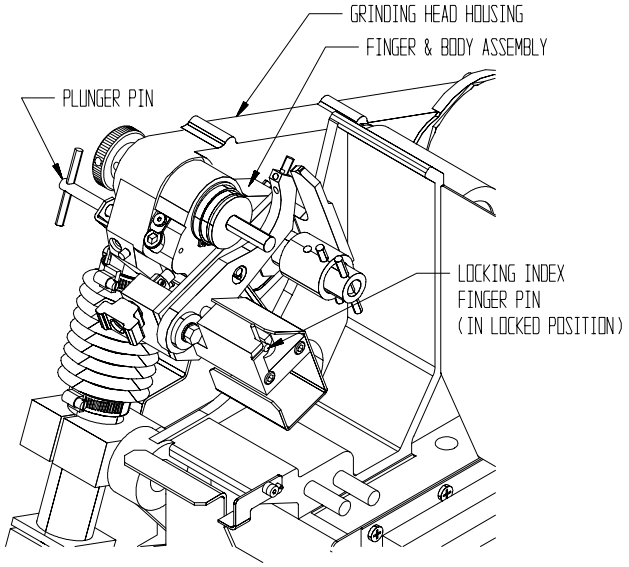


FIG. 27



DETAIL SHOWS FINGER & BODY ASSEMBLY ROTATED (CLOCKWISE) INTO THE SPIN GRINDING POSITION (SHOWN WITHOUT GRINDING WHEEL FOR CLARITY)

FIG. 28

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.

Put the Grind selector switch to Variable Speed Spin.
NOTE: When you put the selector in spin, the Finger and Body Assembly must be down and the index finger must be locked down. If this is not done, the spin drive and jog will not function.

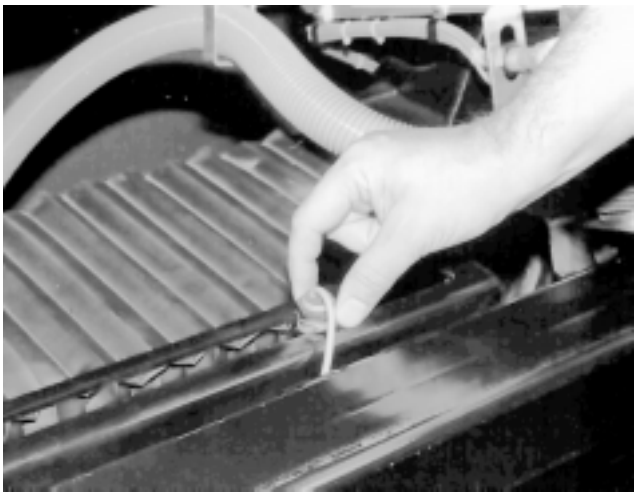


FIG. 29

Close and latch the doors, the grinding wheel motor will not operate with the doors open.

Turn on the Grinding Wheel Motor and the Spin Drive Motor. Set the Spin speed at approximately 210 rpm for 10" [254 mm] reels and 400 rpm for 5" [127 mm] reels. (Refer to Spin Drive Speed Chart). Make sure spin rotation is the same as the grinding wheel - clockwise (CW) looking from right end. See FIG. 30.

NOTE: When the reel turns in the same rotation as the grinding wheel, the point of contact where they meet is in opposite directions.

Depress infeed jog button until you spark off on the reel.

Depress traverse jog button left and right to traverse across the reel finding the high side. **NOTE:** If the grind starts getting heavier, jog the infeed down again until you can travel the full length of the reel without heavy grinding.

NOTE: If you find excessive difference from one side to the other (more than 1/16 [1.5 mm]) you may want to re-verify alignment before going further.

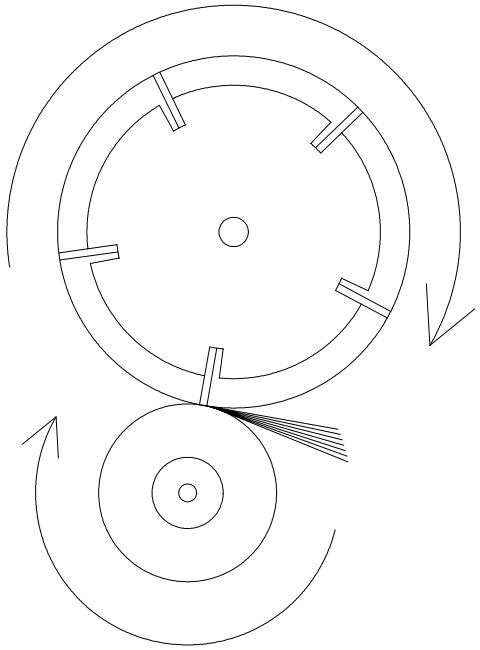


FIG. 30

SPIN GRIND

See grinding wheel safety instructions on page 3.

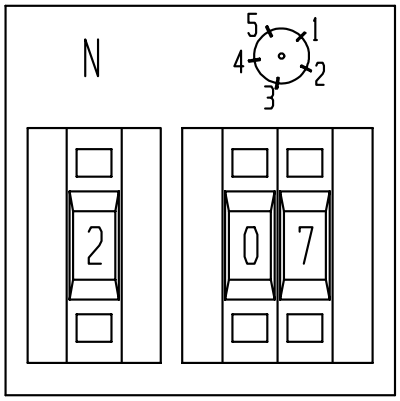


FIG. 31

Manually jog traverse to **HOME POSITION** (all the way to the right side until the right side proximity switch is lit).

Turn on the Dust Collector.

Turn on the Auto/Manual selector to Auto Program.

Select a Spin Program (1-5). Included with your grinder is a laminated grind chart. It is shipped in the Product Packet Assembly. There is a hook on the side of the control panel to hang the chart. At this time look at the chart and select a spin grinding program based on your best estimate as to how much material needs to be removed from the reel to sharpen the reel and remove all cone shape. Set program number accordingly using the thumbwheel marked "N". See FIG. 31.

The LED should then say "SPIN AUTO CYCLE PRESS PROG START SW". See FIG. 32.

NOTE: Set the traverse speed to approximately 15-20 fpm [4-6 meters per minute].

Press and **HOLD DOWN** the program Start button until the grinder starts grinding, then release. You should watch the grinder to insure that it is cycling properly prior to leaving the machine in automatic cycle to do other work.

The Machine will grind until the program is finished. When finished, the grinding wheel will park at the home position, the vacuum motor, spin motor and grind motor will shut off, and amber light on top of the machine will flash.

When the program is finished, turn off the switches for the Spin drive motor, the Grinding Motor and the Dust Collector.

Open the doors and inspect the reel. If it is good, go to the relief grind. If not, repeat the spin program as required.

FIG. 32

RELIEF GRIND

Replace the grinding wheel with the appropriate wheel for relief grinding. Generally a 5" [127 mm] Dia. x 3/8" [10 mm] wide, will be used. As the reel diameter gets smaller and the number of blades increases the relief grinding wheel diameter must get smaller. That is why a 5" Dia. [127 mm] x 3/8" [10 mm] wide and a 3.5" Dia. [89 mm] x 3/8" [10 mm] wide wheel are furnished with the grinder. As a general rule, use the largest grinding wheel practical to relief grind. **NOTE:** 5" [127 mm] diameter greensmower reels with 11 blades require a 3.5" [89 mm] diameter or smaller grinding wheel. Adjust the relief guide finger with the front hand knob so it slightly misses the smaller grinding wheel diameter (about 1/32" [1 mm]).

REEL SPIRAL

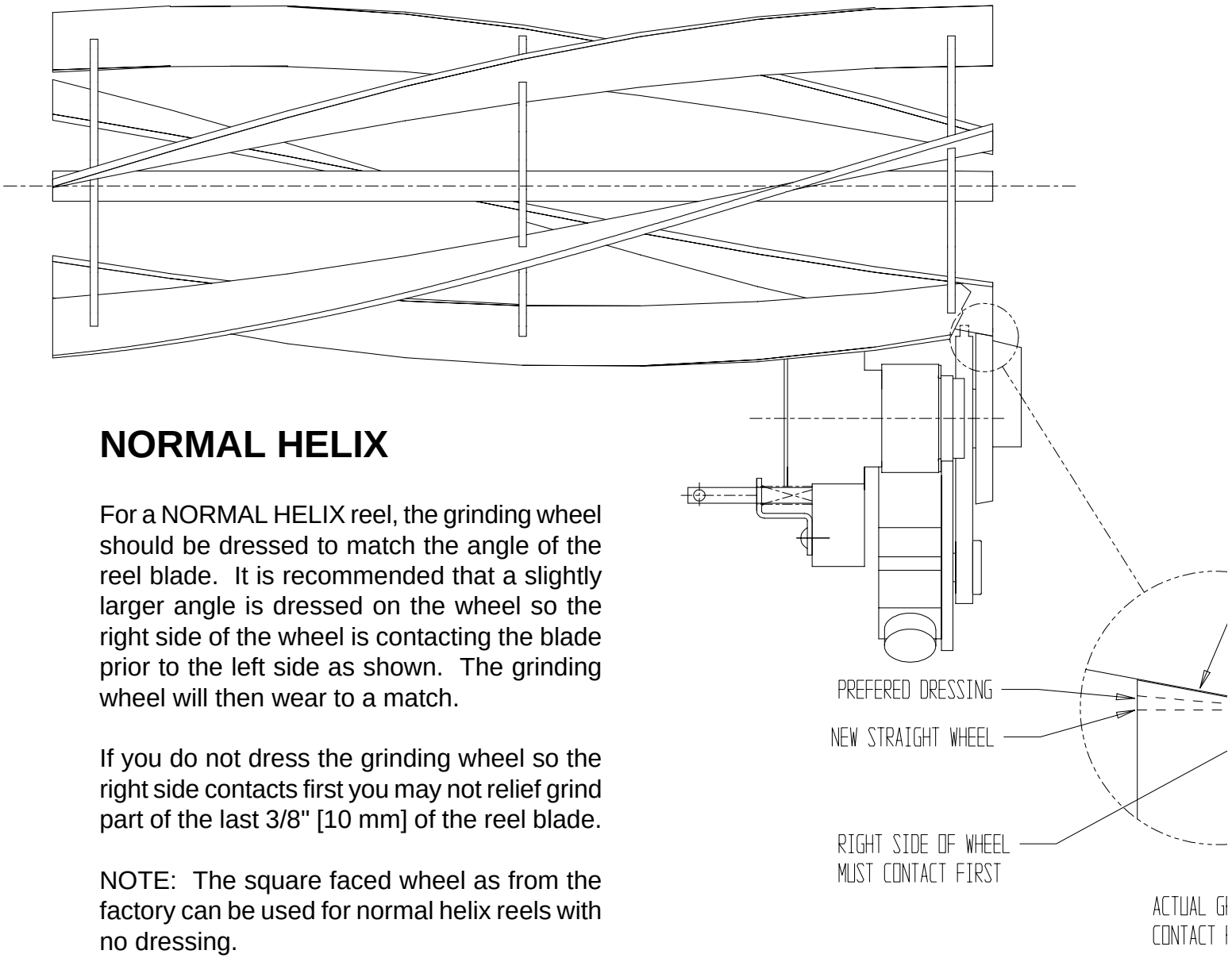
Check to see if your mowing unit is a normal or reverse helix.

NOTE: As you look into the guide finger on **PAGE 30, IT SHOWS THE NORMAL REEL HELIX.** The high point of the relief finger is on the right hand side of the grinding wheel.

As you look into the guide finger on **PAGE 31, IT SHOWS THE REVERSE REEL HELIX.** The high point of the relief finger is on the right hand side of the grinding wheel.

Most mowing units are normal helix.

THE HIGH POINT OF THE RELIEF FINGER MUST ALWAYS BE AT THE CORNER OF THE GRINDING WHEEL THAT IS MAKING CONTACT WITH THE REEL. ON THIS GRINDER THAT IS ALWAYS THE RIGHT HAND SIDE OF THE GRINDING WHEEL. SEE PAGES 30 AND 31.



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.

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 as 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.

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.

NOTE: A wheel that has been worn to match a normal helix can generally be removed and reversed to grinder reverse helix reels.

OPERATING INSTRUCTIONS (Continued)

Reset the Traverse Limit Proximity Switch so the grinding wheel clears the reel at both ends by approximately 1/16" [1.5 mm]. Make sure the Reel Positioner Adjuster is set at its mid point. See Relief Angle Adjustment on Page 13.

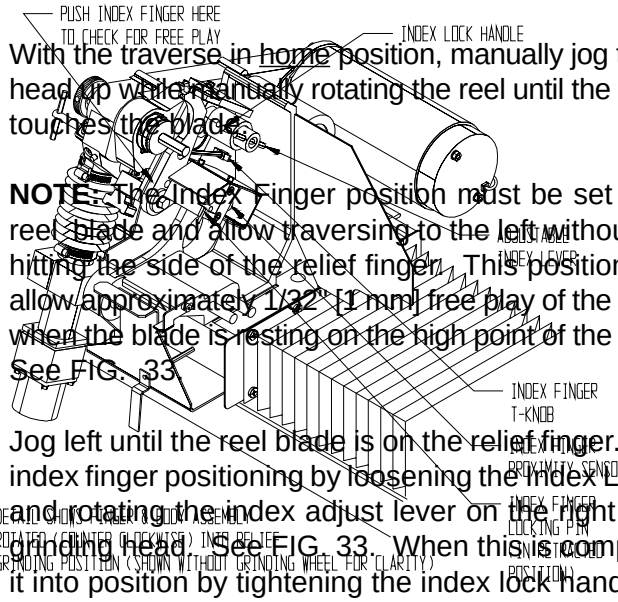
Pull the left side plunger pin and rotate the Finger and Body Assembly up (back, away from the operator) into the relief position until the left side plunger pin locks into position. See FIG. 33. The plunger pin must be fully engaged to the Adjustable Relief Adjuster for proper function.

Pull the right side locking index finger pin to release the index finger and rotate the handle into the retracted position. See FIG. 33.

Set Grind Selector to variable torque relief. **NOTE:** When you put the selector in relief, the Finger and Body Assembly must be up and the index finger must be unlocked and in the forward position. If this is not done, the spin drive and jog will not function.

Set Auto/Manual selector to manual jog.

Set Spin Drive Rotation switch to rotate the reel into the stop finger, counterclockwise (CCW) when looking at the right side. **NOTE:** Relief torque reel rotation is always opposite spin rotation.



With the traverse in home position, manually jog the grinding head up while manually rotating the reel until the index finger touches the blade.

NOTE: The Index Finger position must be set to stop the reel blade and allow traversing to the left without the blade hitting the side of the relief finger. This position must also allow approximately 1/32" [1 mm] free play of the index finger when the blade is resting on the high point of the relief finger. See FIG. 33.

Jog left until the reel blade is on the relief finger. Adjust the index finger positioning by loosening the Index Lock Handle and rotating the index adjust lever on the right side of the grinding head. See FIG. 33. When this is completed, lock it into position by tightening the index lock handle.
Continue to jog the grinding head up until there is minimal clearance between the reel blade and the grinding wheel.

Check the Proximity Sensor on the Index Finger (right side proximity switch under the spark shield) to insure that it makes contact (the proximity switch light on) when the index finger catches a reel blade.

Push Index Finger here to check for free play

Index Lock Handle

Adjustable Index Lever

Index Finger T-Knob

Index Finger Proximity Sensor

Index Finger Locking Pin (in retracted position)

Detail shows Finger and Body Assembly rotated (counterclockwise) into relief grinding position (shown without grinding wheel for clarity).

FIG. 33

Close and latch the doors, the grinding wheel motor will not operate with the doors open.

Turn the Spin Drive motor on. **NOTE:** The spin drive will apply a torque load against the fingers.

Set the Relief Torque Potentiometer at approximately 15. **NOTE:** Free turning reels may need a lower value than 15. Stiff reels or reels with a drive train may need a higher torque than 15. Do not exceed 45 on the relief torque potentiometer setting.

Manually jog the traverse all the way to the left watching for proper clearance between the grinding wheel and the blade. Check for proper clearance between the index finger (after releasing from blade at far left position) and the front side of the blade on the return trip to the home position. Also verify clearance to the reel blade support spiders.

Stop the traverse in home position and check for a proper blade index.

At this point, you can adjust the relief angle by turning the Reel Positioner Adjuster. See FIG. 35. You can increase the relief angle approximately 8 degrees by rotating the Reel Positioner Adjuster clockwise. You can decrease the relief angle approximately 8 degrees by rotating the Reel Positioner Adjuster counterclockwise.

Select a Relief program (6-0). Included with your grinder is a laminated grind chart. It is shipped in the Product Packet Assembly. There is a hook on the side of the control panel to hang the chart. At this time look at the chart and select a relief grinding program based on your best estimate as to how much material needs to be removed from the reel to achieve the correct relief. Set program number accordingly using the thumbwheel marked "N". See FIG. 34.

Set relief blade number to match the number of blades in the reel using the two thumbwheels on the right in FIG. 34.

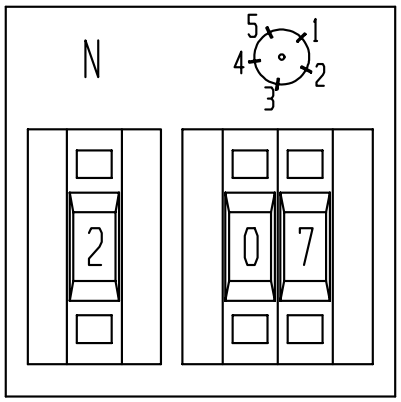


FIG. 34

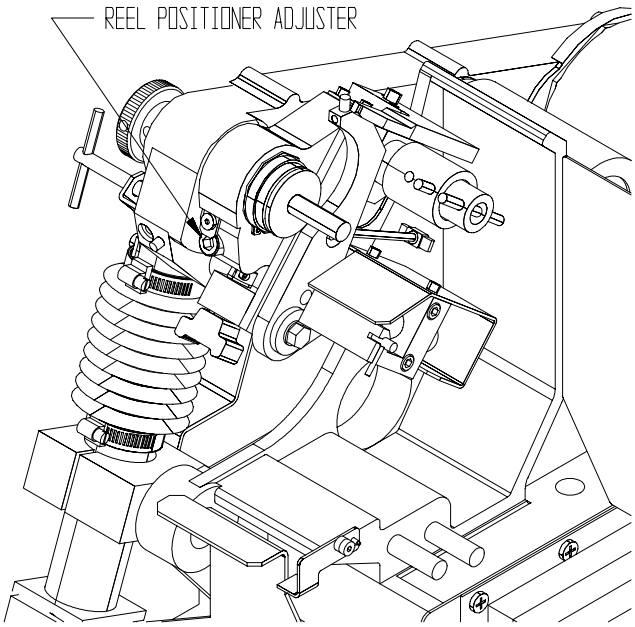


FIG. 35

Not having the number of blades set correctly will result in double grinding some blades or not grinding all the blades.

Set Auto/Manual selector to Auto Program.

Turn on the Spin Drive Motor (should already be on), the Dust Collector and the Grinding Wheel Motor.

The LED should then say "RELIEF AUTO CYCLE PRESS PROG START SW".

NOTE: Traverse speed should be approximately 15 fpm. If you are removing a small amount of stock on initial infeeds, faster traverse speeds are suggested. If you are removing a large amount of stock on later infeeds, slower traverse speed may be required.

Push Program Start button and **HOLD DOWN** until grinding starts, then release. You should watch the grinder insure that it is cycling properly prior to leaving the machine in automatic cycle to do other work.

The program will grind until done it will turn off the dust collector, spin motor, traverse motor, grinding motor and will park at the home position. The amber light on top of the grinder will flash when the program is completed.

At the end of the program, shut off the switches for the Grinding Wheel Motor, Dust Collector and the Spin Drive Motor.

Open the doors and inspect the relief grind.

Repeat the relief grind if needed.

Reels with one or more blades broken off from the outside spider to the edge of the reel cannot be relief ground in automatic cycle. You must relief grind these reels in the jog mode controlling the traverse travel with the traverse jog switch.

REEL SETUP CHART

Note: These dimensions will vary due to reel position in frame, reel dia., height of cut roller position, etc. Use these values as a guide only.

REEL MAKE AND MODEL	VERTICAL SCALE	HORIZONTAL SCALE	TOOLING DISTANCE APART	SPIN DRIVE MOUNTING SIDE R or L	GRINDING WHEEL DIA.	NOTES