

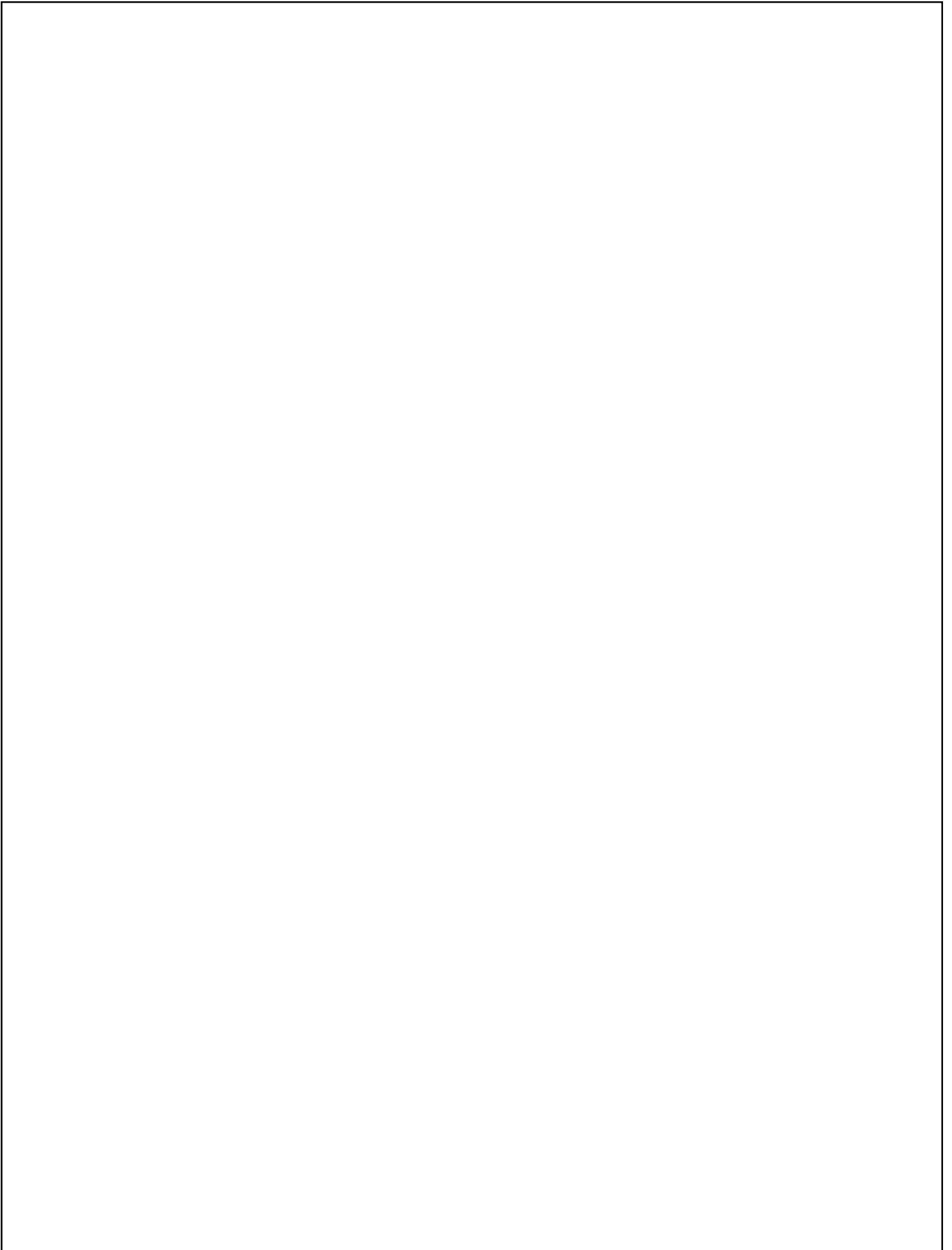
*Setting the Standard With the
World's Most Valued Grinders.*

**ACCU-Pro
MODEL 670
SEMI-AUTOMATIC
BEDKNIFE GRINDER**

This book consists of two manuals:

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

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



ACCU-Pro MODEL 670 SEMI-AUTOMATIC BEDKNIFE GRINDER

OPERATORS MANUAL



WARNING

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

SAFETY INSTRUCTIONS



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



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

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

1. **KEEP GUARDS IN PLACE** and in working order.
2. **REMOVE WRENCHES AND OTHER TOOLS.**
3. **KEEP WORK AREA CLEAN.**
4. **DON'T USE IN DANGEROUS ENVIRONMENT.** Don't use Grinder in damp or wet locations, or expose it to rain. 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 bedbar and bedknife is securely fastened with the electromagnets provided before operating.
12. **DON'T OVERREACH.** Keep proper footing and balance at all times.
13. **MAINTAIN GRINDER WITH CARE.** Follow instructions in the Assembly and Service Manual for lubrication and preventive maintenance.
14. **DISCONNECT POWER BEFORE SERVICING.**
15. **REDUCE THE RISK OF UNINTENTIONAL STARTING.** Make sure all switches 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

DON'T

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.
10. **DO TURN OFF COOLANT** before stopping to avoid creating an out-of-balance condition.
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 unequalled 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.

This machine is intended for grinding the bedknife from a reel type mowing unit 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.

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Daily Maintenance	Page 6
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SPECIFICATIONS

Electrical Requirements	115V 50/60 Hz, 15-amp circuit
Net Weight	780 lbs [354 kg]
Shipping Weight	920 lbs [417 kg]
Maximum Grinding Length	34 in. [863 mm]
Sound Level	Less than 75 Db

DAILY MAINTENANCE

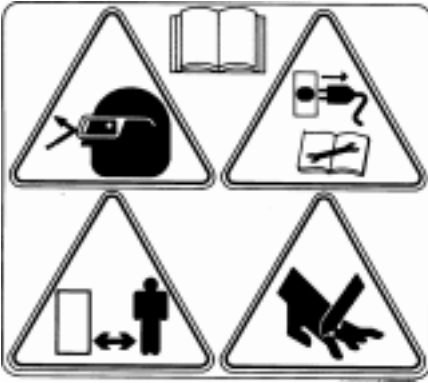
- On a daily basis, clean the grinder by wiping all areas down.
- On a daily basis, check coolant tray fluid level and filter sock content.
- Replace filter sock when full (about 6" [15 cm]).
- On a daily basis, inspect the grinder for loose fasteners or components and tighten.
- Contact your company's Maintenance Department if damaged or defective parts are found.



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

OPERATING INSTRUCTIONS

PLEASE TAKE SPECIAL NOTE OF THE FOLLOWING WARNING DECALS LOCATED ON THE ACCU-PRO BEDKNIFE GRINDER.



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

Symbol for keep visitors a safe distance away from grinder and the symbol for sharp object which will cause serious injury.



Symbol for hot surface which could cause burns.



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.

--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.

**SEE PAGE 3
FOR GRINDING
WHEEL SAFETY.**



GETTING TO KNOW YOUR GRINDER

Fig. 1 shows the major areas of the Grinder which will be referred to in the operating instructions in the remainder of this manual.

The next few pages show details of some of those areas and point out the various controls you will use when operating.

CONTROL BOX

The control box contains the electrical controls for the Grinder. START and STOP switches are located on the top panel. See Page 7 for details.

GRINDING HEAD

The grinding head consists of the grinding wheel and safety guard, and the motor which drives the wheel. See Page 8 for details.

DRIVE CARRIAGE AND VERTICAL ADJUSTER

The carriage and vertical adjuster provide a movable support for the grinding head. A handwheel (see Page 8 for details) adjusts the grinding wheel position forward and back. An eccentric cam and lock adjusts the grinding wheel position up and down.

TRAVERSE MOTOR AND DRIVE SHAFT

A drive shaft with a linear actuator traverses the carriage from side to side, to move the grinding wheel along the bedknife. The shaft is driven by a motor at the right end of the machine.

BEDKNIFE SUPPORTS

Two electromagnets assemblies support the bedknife for grinding. A fixed electromagnet on the left end, and an adjustable electromagnet on the right end. See Page 9 for details.

TOOLING ROTATION

To grind the top face and front face of the bedknife the tooling assembly rotates. This rotation is accomplished through an electromechanical actuator with calibrated stop pins to set the correct angle. See Page 11 for details.

PROXIMITY SWITCHES

Two movable switches determine the left and right limits of carriage traverse. An LED on the switch lights when the switch actuator on the bottom of the carriage gets close to the head of the switch (touching the switch head with a steel object will trigger the switch). See Page 11 for details.

COOLANT TANK

A tank which sets under the Grinder holds liquid coolant to be sprayed onto the bedknife during grinding, to minimize heat buildup.

COOLANT TRAY

A large tray along the back of the Grinder serves as a splash guard and collects the splashed liquid for return to the Coolant Tank.

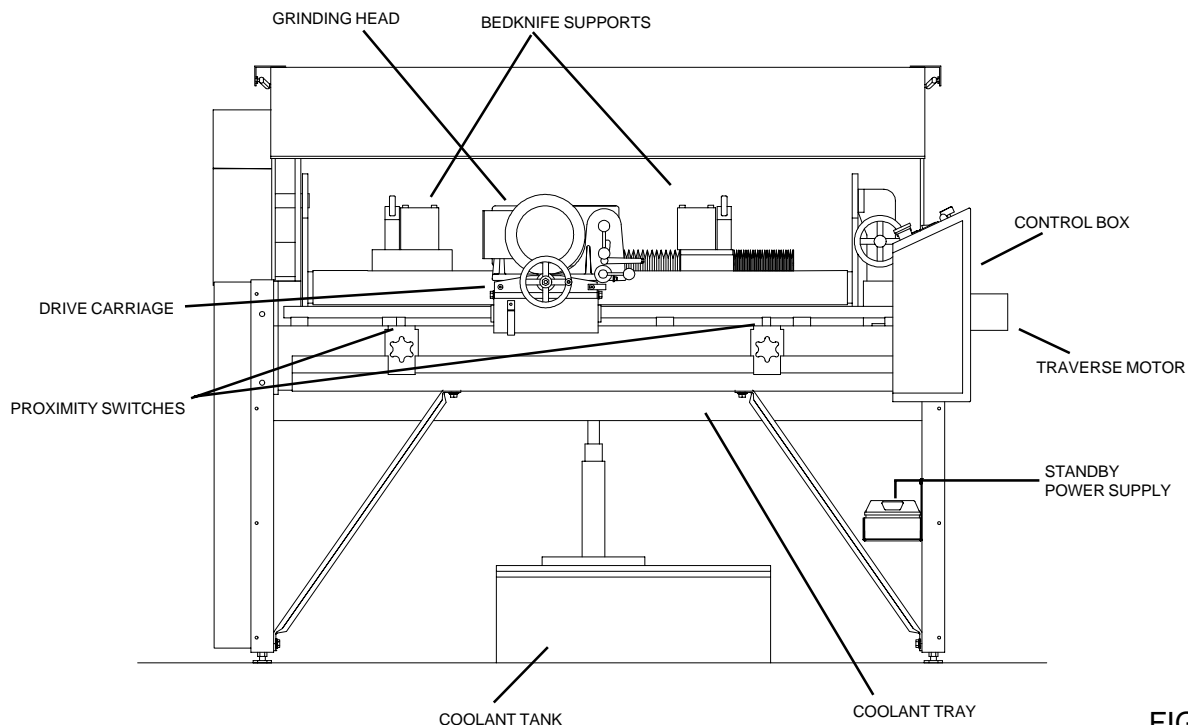


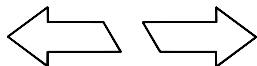
FIG. 1

GETTING TO KNOW YOUR GRINDER (Continued)

CONTROL PANEL (FIG. 2)

TRAVERSE FT./MIN KNOB

Controls the travel speed of the carriage and grinding head, from 0 - 35 feet [0 - 10.7 meters] per minute.



START Button (Green)

Acts as a reset button after STOP has been pressed. The grinding motor switch must be in the off position or the guard door must be closed or the start button will not reset.



IF THE TRAVERSE SWITCH OR THE COOLANT PUMP SWITCH ARE IN THE ON POSITION, THEIR FUNCTIONS WILL IMMEDIATELY START WHEN START IS PRESSED.

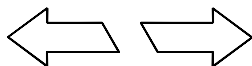


STOP Button (Red)

Shuts down power to the Grinder with the exception of the electromagnets.

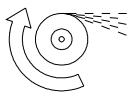
CARRIAGE TRAVERSE Switch (ON/OFF)

Controls electrical power to the motor which turns the drive shaft to traverse the carriage.



GRINDING WHEEL Switch (ON/OFF)

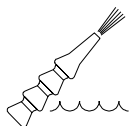
Controls electrical power to the grinding head motor. This switch is tied into the door interlock. This switch will function only when the door is closed.



FOR SAFETY, WHENEVER STOP IS PRESSED TO SHUT DOWN THE MACHINE, SHUT OFF ALL SWITCHES, EXCEPT FOR THE ELECTROMAGNET SWITCH. YOU CAN THEN PRESS START TO START THE GRINDER.

COOLANT PUMP Switch (ON/OFF)

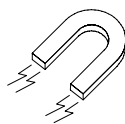
Controls electrical power to the flood coolant system.



ELECTROMAGNET SWITCH and LIGHT (ON/OFF)

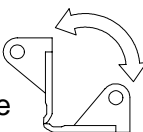
Controls electrical power to the electromagnets for holding the bedknife and bedbar.

This switch is independent from the start and stop switches and is powered through the standby power supply. Green light indicates power to magnets is on.



TOOLING POSITION SWITCH (MOMENTARY)

Controls DC electrical power to the tooling rotation actuator. Pushing up causes the tooling to rotate up to the preset top face stop. Pushing down causes the tooling to rotate to the preset front face stop.



The START and STOP buttons control the main power to the Grinder, **except the electromagnets which are independently powered.** Use the other switches to control the separate operating functions. To start the grinding operation: With all switches OFF and the guard door closed, press the START button. Turn the GRINDING WHEEL switch ON. Turn the COOLANT PUMP and CARRIAGE TRAVERSE switches ON.



ALWAYS TURN THE GRINDING WHEEL ON FIRST, TO AVOID A VOLTAGE DROP TO THE REVERSING CIRCUIT OF THE CARRIAGE TRAVERSE.

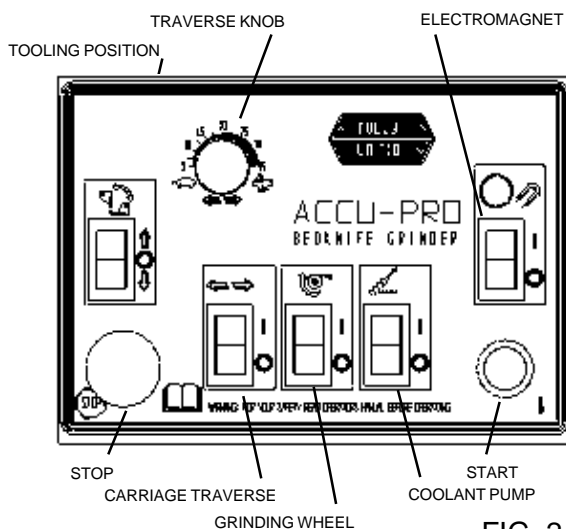


FIG. 2

GETTING TO KNOW YOUR GRINDER (Continued)

DRIVE CARRIAGE (FIG. 3)

Vertical Eccentric Adjustment and Lock

Moves the grinding head up and down.

Horizontal Handwheel

Moves the grinding head infeed in and out.

Horizontal Adjustment Scale

Calibrated in .002 in [.05mm] increments, so you can accurately move the grinding wheel in for each pass across the face of the bedknife.

GRINDING HEAD (FIG. 3)

Wheel Guard Lock Screws

A T-knob holds the guard in position. Loosen it to pivot the guard when the guard interferes with the bedbar.

Diamond Wheel Dresser

Allows you to dress the grinding wheel. Cleaning and dressing the grinding wheel improves the quality of the grind. See Page 13 for more information.

COOLANT SYSTEM (FIG. 3)

See Page 14 for more information about the system.

Coolant Nozzle

Directs a stream of coolant onto the bedknife and grinding wheel, if the coolant system is turned on. For precise aiming, the nozzle and connecting tubing are completely flexible.

Coolant Flow Valve

Controls the volume of coolant flowing to the nozzle. Use only enough flow to cool the bedknife. Excess flow will cause excess splashing - and **won't** improve performance.

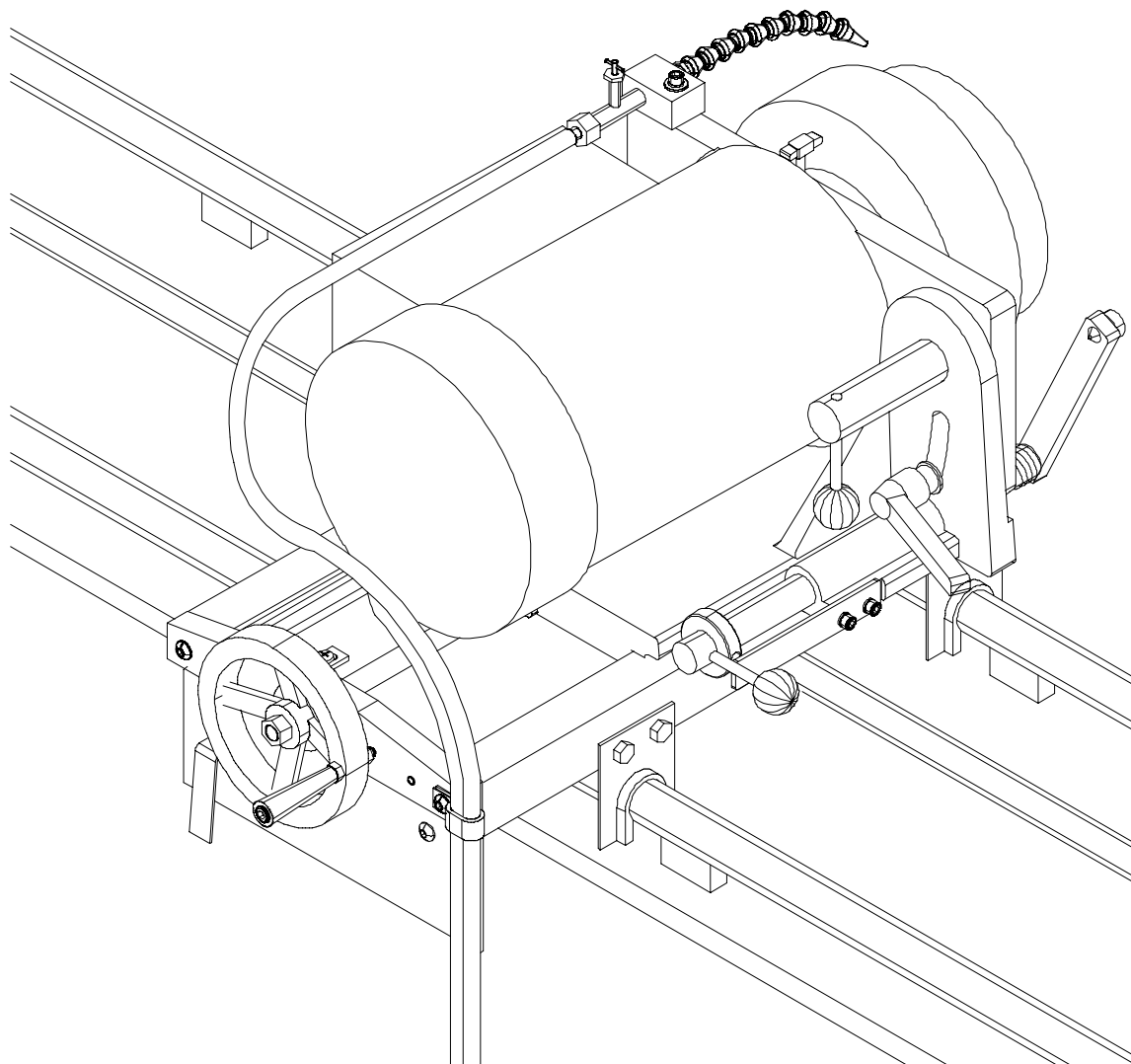


Fig. 3

GETTING TO KNOW YOUR GRINDER (Continued)

FIXED ELECTROMAGNET SUPPORT (FIG.4)

The bedknife and bedbar is held in position by two electromagnets. The left side electromagnet position is fixed.

ADJUSTABLE ELECTROMAGNET SUPPORT (FIG. 4)

The right side electromagnet is adjustable to match bedknife width.

Electromagnet Lock Knob

Locks the right electromagnet assembly in position on the tooling bar slide.

R.H. TOOLING ALIGNMENT ADJUSTER (FIG 5)

Adjustment Handwheel

Adjusts the right side of the tooling assembly to allow the tooling assembly to be adjusted out of parallel position to get maximum life from used bedknives.

Zeroing Dial Indicator

After the right side adjustment has been moved out of alignment to maximize bedknife life, it can be returned to the factory set zero position by adjusting until the dial indicator reads .500.

BEDKNIFE GAGE (FIG.4)

On the outside of each electromagnet is a retractable bedknife gage. These gages are used to align the bedknife to the grinding wheel carriage travel. See Page 17 for detailed explanation of use.

STANDBY POWER SUPPLY (FIG. 6)

Electromagnetic energy holds the bedknife/bedbar assembly in place during grinding. If the power is interrupted at an outside source, the bedknife would release. To avoid this situation, a Standby Power Supply is connected into the electromagnet circuit. If the power is interrupted, it will power the magnets for approximately 5 minutes.

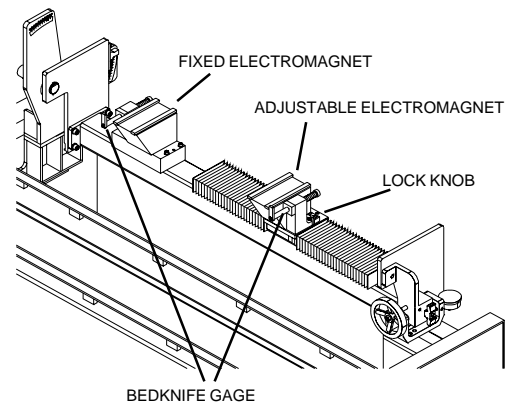


FIG. 4

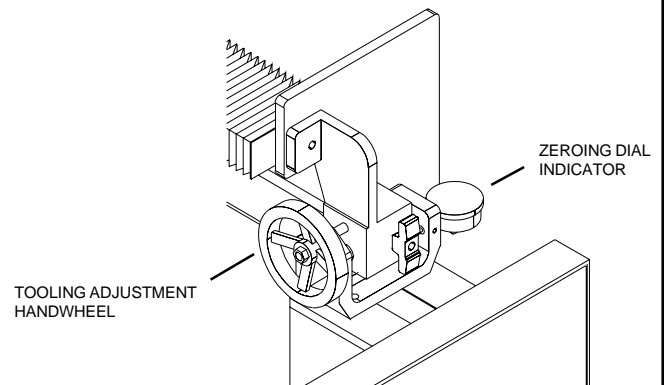


FIG. 5

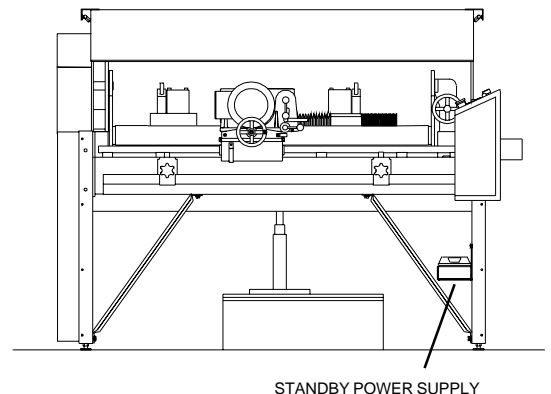


FIG. 6



FOR SAFETY, IF THE POWER IS INTERRUPTED, THE OPERATOR SHOULD REMOVE THE BED-KNIFE WITHIN 3-5 MINUTES.



THE NORMAL LIFE OF THE BATTERY IS THREE YEARS. THE BATTERY SHOULD BE REPLACED AFTER THREE YEARS OF USE.

GENERAL OPERATING INFORMATION

WHEN TO SHARPEN THE BEDKNIFE

NOTE: To fully sharpen a reel mower, you need to grind the reel blades (using a Reel Grinder) **and** re-shape the cutting edge of the bedknife (using the ACCU-Pro Bedknife Grinder).

NOTE: New bedknives should be ground before being put into use. New bedknives deform and move to match the shape of the bedbar at the time of installation and therefore must be ground to a straight surface after installation.

When the grass is not being cut cleanly, or the cut ends of the grass appear torn or ragged, the edges of the reel blade and bedknife have become rounded and need sharpening. See FIG. 7A. The purpose of sharpening is to restore the sharp edges to the reel and bedknife as well as to return the mowing unit to the manufacturers recommended configuration. See FIG. 7B.

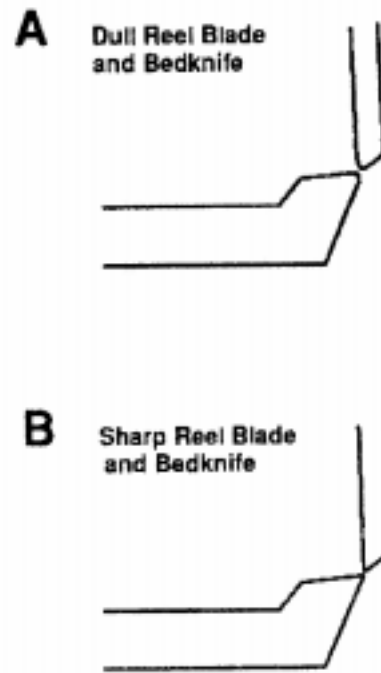


FIG. 7

BEDKNIFE GRINDING ANGLES

The bedknife has two faces that normally need to be ground - the top face and the front face (on some models, the front face may be curved and not need grinding.)

The proper grinding angles for the two faces will vary, depending on the reel manufacturer. **Always follow the manufacturer's recommended specifications for bedknife angles.**

Typically, however:

- * There will be a +8 to -10 degrees clearance angle ground on the top face. It will **usually** be measured relative to the bedknife mounting surface. See FIG. 8-A.
- * There will be a 0-30 degrees clearance angle ground on the front face. It will **usually** be measured relative to a line **perpendicular** to the bedknife mounting surface. See FIG. 8-B.

How to obtain these angles is discussed in more detail in the operating instructions, beginning on Page 16.

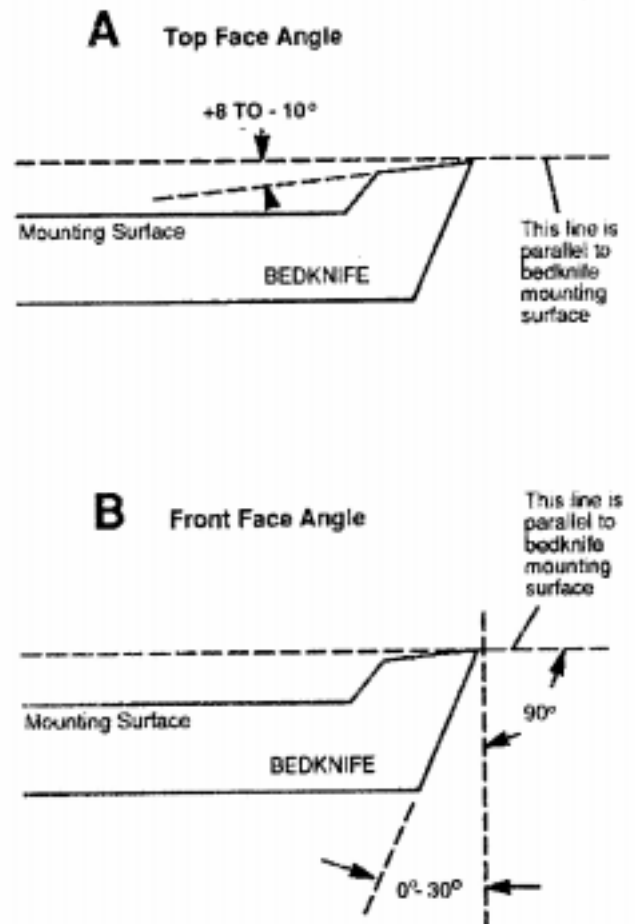


FIG. 8

GENERAL OPERATING INFORMATION (continued)

TOOLING ROTATION

To achieve the angles as described on page 10, the ACCU-Pro bedknife grinder has a movable tooling bar with calibrated stops. Fig. 9 shows the upper or top face stop and the lower or front face stop. The tooling bar is moved from stop to stop with an electromechanical actuator on the left side of the grinder. It is moved by pressing the tooling position switch on the control panel.

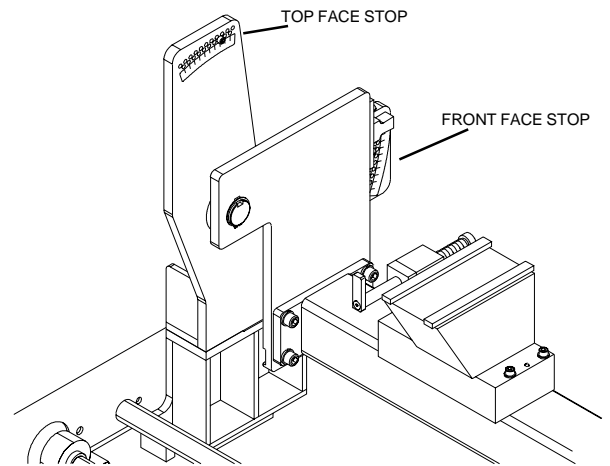


FIG. 9

TRAVERSE TRAVEL LIMIT PROXIMITY SWITCHES

The ACCU-Pro bedknife grinder has proximity switches to stop the carriage travel and reverse direction. See Fig. 10. They are adjustable by loosening the star knob and sliding the assembly along the rail and retightening.

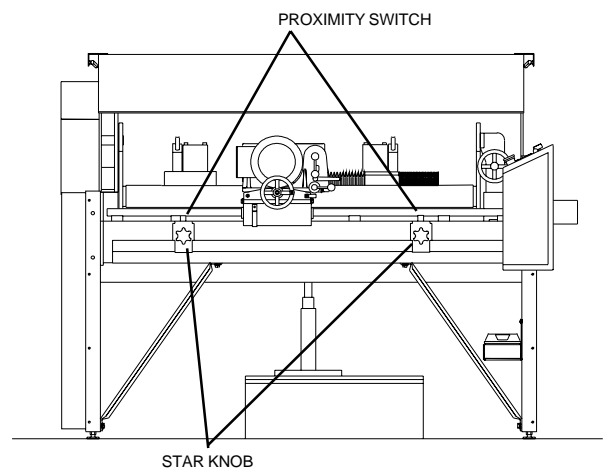


FIG. 10

GENERAL OPERATING INFORMATION (Continued)

MOUNTING A GRINDING WHEEL

To replace the grinding wheel: See FIG. 11.

1. Turn the GRINDING WHEEL switch **OFF**.
2. Unscrew the mounting flange that holds the grinding wheel, using a 3/4" open-end wrench.
3. Remove the old wheel and install the new one.
4. Screw on the flange finger tight, then tighten approximately 1/8 turn further with the wrench. It will self-tighten when the motor is turned on.

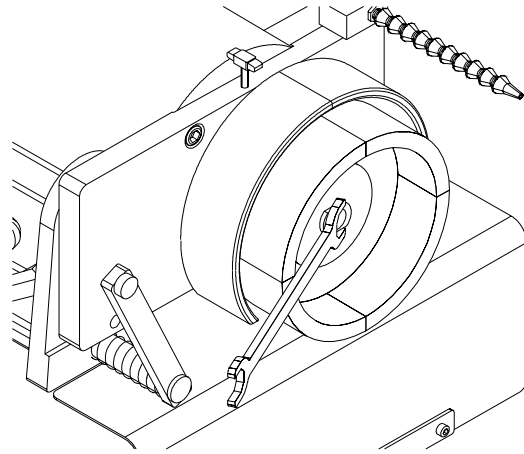


FIG. 11



IF THE WHEEL FLANGE IS OVERTIGHTENED, THE GRINDING WHEEL MAY CRACK AND FLY APART.

5. After you install a new or different wheel, it is recommended that you dress it before grinding. Dressing trues the grinding surface of the wheel and removes the hard glaze sometimes remaining from the manufacturing process. This dressing properly prepares the wheel for grinding. See Page 13.

GRINDING WHEELS AVAILABLE FOR ACCU-Pro BEDKNIFE GRINDER

WHEEL PART NO.	COLOR/DESCRIPTION/SIZE	GRIT	
3700060	White/red flare-cup wheel 6/3-1/4 x 2 0.627 inch bore, vitrified ruby	60	
3700062	White flare-cup wheel, 6/ 3-1/4 x 2 0.627 inch bore, vitrified	46	
3700268	White/red straight-cup wheel, 6 x 2 x 0.627 inch bore, vitrified ruby	60	
3700411	White straight-cup wheel, 6 x 2 x 1.25 inch bore, vitrified	46	
3700696	Borazon straight-cup wheel, 6 x 1-1/2 x 0.625 inch bore	120	For normal or extra hardened bedknife.

,For more information on flare-cup wheels, see Page 15.

GENERAL OPERATING INFORMATION (Continued)

DRESSING THE GRINDING WHEEL

Dress the grinding wheel whenever there is any glazing ("glazing" is the buildup of stone dust, grinding grit, and coolant on the face of the wheel). For best results, also dress the wheel before making the final grind.



REFER ALSO TO THE "SAFETY RULES WHEN GRINDING" ON PAGE 3.

For dressing, always move the grinding head to the right hand side of the machine as shown in FIG. 12, so you are clear of the bedknife.

With the wheel turning, lift the dresser movement arm off its holder, push it forward and swing the dresser around to the grinding face of the wheel. Turn the adjuster ring until the diamond point just touches the wheel. See FIG. 13 or 14. When completed, rotate handle clockwise against the lock bracket before pulling back and replace the dresser movement arm in the holder.

NOTE: Excessive dressing will shorten the life of the wheel and may cause the diamond to be dislodged from the dresser tip. To little dressing will inhibit proper grinding.

Replacing the Wheel

A new vitrified grinding wheel is 2" [51 mm] deep. When it wears down to a depth of 0.75" [19 mm], it should be replaced. See FIG. 15.

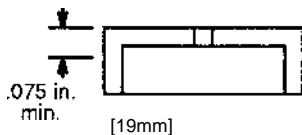


FIG. 15

ROTATING THE WHEEL GUARD

Some bedknives and bedbars have mounting ears so close to the bedknife top face that there is no clearance for the wheel guard. For these applications, generally a flared cup grinding wheel should be used and the grinding wheel guard can be loosened and rotated so the clearance area of the guard allows the bedknife to be ground without interference. When completed, **ALWAYS** reposition the guard to its normal position with the clearance notch down. See FIG. 16



FOR OPERATOR SAFETY, THE GRINDING WHEEL GUARD MUST BE USED WITH THE CLEARANCE AREA UP ONLY WHEN REQUIRED FOR BEDBAR CLEARANCE.

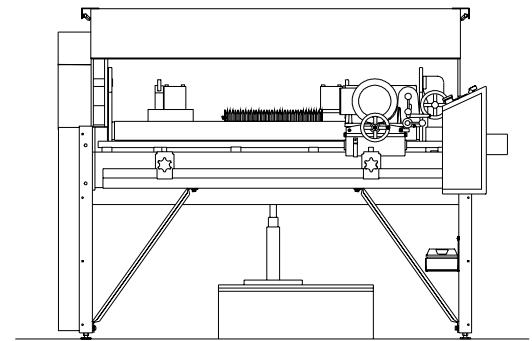


FIG. 12

DRESSER IN LOCKED POSITION

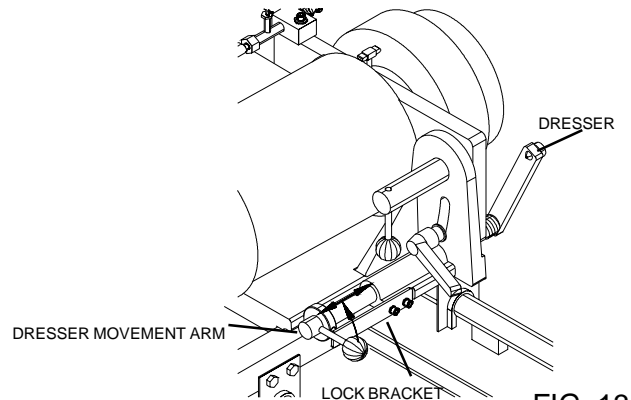


FIG. 13

DRESSER UNLOCKED & READY TO USE

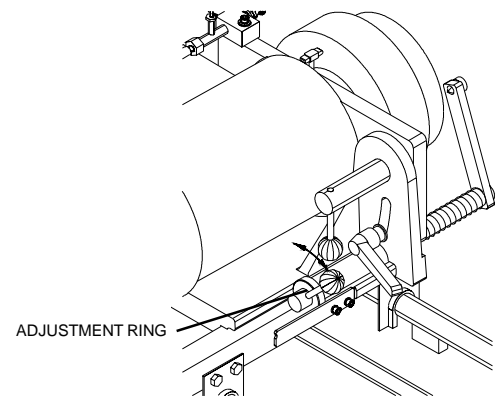


FIG. 14

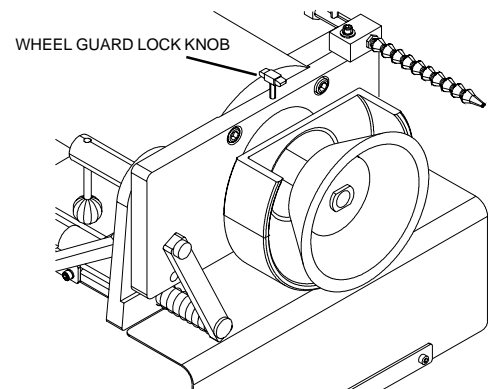


FIG. 16

GENERAL OPERATING INFORMATION (Continued)

USING FLOOD COOLANT

For quality grinding, we highly recommend using flood coolant to prevent heat buildup on the knife edge.



IF YOU DO DRY-GRIND, NEVER ALLOW THE BEDKNIFE EDGE TO CHANGE COLOR OR YOU MAY LOSE THE TEMPER IN THE KNIFE EDGE.

ALWAYS READ THE MATERIAL SAFETY DATA SHEET (MSDS) FOR THE COOLANT YOU ARE USING. BELOW ARE WARNINGS THAT APPLY TO MOST COOLANTS.



AVOID CONTACT OF COOLANT WITH EYES: IT WILL CAUSE EYE IRRITATION. WEAR FACE SHIELD OR GOGGLES WHEN HANDLING CONCENTRATE. IN CASE OF CONTACT, FLUSH EYES WITH WATER FOR 15 MINUTES AND CONTACT A PHYSICIAN.

AVOID BREATHING MISTS. PROVIDE LOCAL VENTILATION. KEEP CONCENTRATED BOTTLE CLOSED WHEN NOT IN USE.

CONTINUED CONTACT OF CONCENTRATE ON SKIN MAY CAUSE IRRITATION. WASH WITH SOAP AND WATER AFTER CONTACT.

DO NOT TAKE INTERNALLY. IF INGESTED, CONSULT PHYSICIAN AND DO NOT INDUCE VOMITING.

(HAZARD POTENTIAL APPLIES TO CONCENTRATE, AND IS LESS AT NORMAL USE DILUTION.)

Mixing the Coolant

Mix Part No. 3708620 Coolant in the Coolant Tank, at a ratio of 50 parts water to 1 part concentrate. Refer also to the label on the Coolant container. If the Tank is empty, this will take about 6 gallons of water and 1 pint of concentrate [24 liters of water, and 0.5 liter of concentrate].



THE COOLANT RATIO AS SPECIFIED MUST BE USED. TOO HIGH A CONCENTRATION OR LOW A CONCENTRATION WILL CAUSE CORROSION AND PERFORMANCE PROBLEMS.

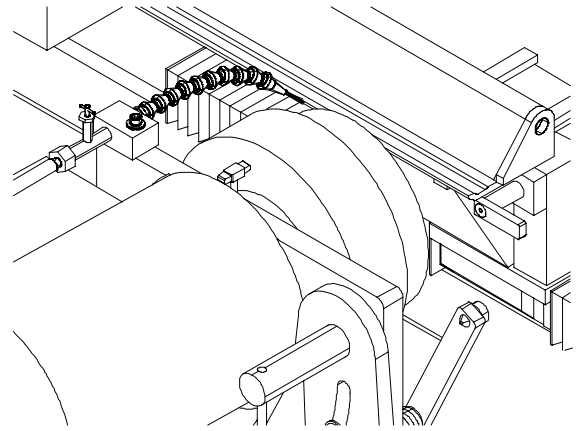


FIG. 17

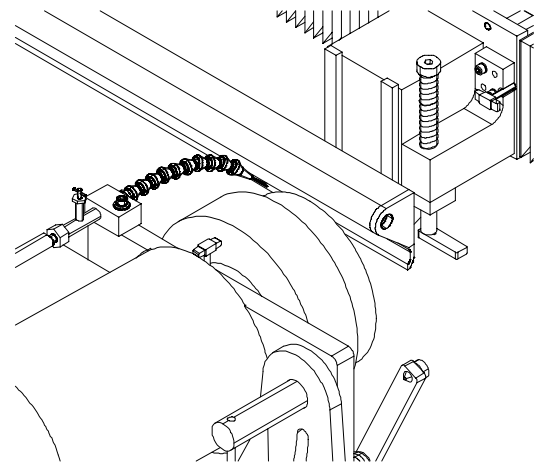


FIG. 18

Using the Coolant

Direct the nozzle so the coolant sprays onto the bedknife face being ground. See FIG. 17 or 18.

Some coolant will then also be deflected onto the grinding wheel. Adjust the flow valve so there is a steady stream of coolant. Avoid a stronger flow than needed, excessive coolant doesn't cool more, and increases splattering.

Fluid Level in Coolant Tank

Check the fluid level in the Coolant Tank daily to avoid running out while grinding. Keep the coolant level between 1" and 4" [25 and 100 mm] from the top of the tray.

The pump inlet must **always** be completely submerged in water. Never add plain water to the coolant when the level is low. Always add water and concentrate in the correct proportions. It is recommended to pre-mix coolant and water in a separate container for this purpose.

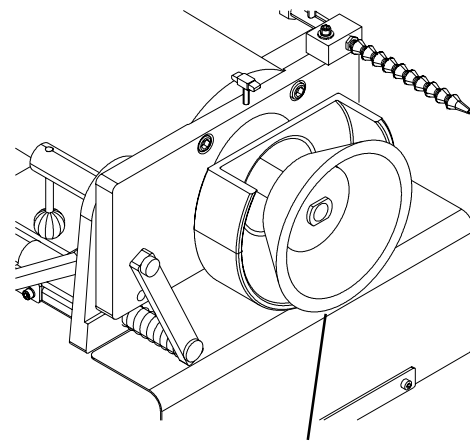
GENERAL OPERATING INFORMATION (Continued)

USING A FLARE CUP WHEEL FOR ADDED CLEARANCE

The shape of some bed bars requires using an **optional** flare-cup grinding wheel to clear the end supports. See FIG. 19.

Flare-cup wheels can be ordered in several 6" [150 mm] diameter versions. For most applications, the 6" vitrified wheel is used. However, if the end mounting flanges of the bedknife are more than 2" [50 mm] high or near the front face of the knife, you may need the optional 6" flared cup wheel.

For Part Numbers and descriptions of all available grinding wheels, refer to the Grinding Wheels list on Page 12.



FLARED-CUP WHEEL

FIG. 19

OPERATING INSTRUCTIONS (Continued)

MOUNTING A BEDKNIFE FOR GRINDING

Inspect and Clean the Bedknife

Inspect the bedknife for damage (cracks, warping, bushing wear, excessive bedknife wear). Replace or repair if necessary, see the mowing unit manufacturer's manual. Thoroughly clean the bedknife, especially on the bottom where the electromagnets will attach. **It is recommended to thoroughly wire brush these areas.**

Set the Bedknife Angles

1. From the Mowing Unit manual or from the Mowing Unit manufacturer, determine what the correct top face angle and front face angle is for your bedknife. See Page 10.
2. Move the tooling Rotation Actuator so the tooling bar stop is at midpoint between the front face stop and the top face stop. See Fig. 20.
3. Move the Tooling Rotation stop pin for the front face to the correct angle. See Fig. 20.
4. Move the Tooling Rotation stop pin for the top face to the correct angle. See Fig. 20.

Prepare the Machine for Mounting the Bedknife

Pivot the tooling assembly to the horizontal position (Front face grinding position). Traverse it all the way to the right, then crank the carriage back (away from the electromagnets) to gain clearance for the bedknife.

Always wipe any grindings, dirt, etc. from the electromagnets before mounting the bedknife.

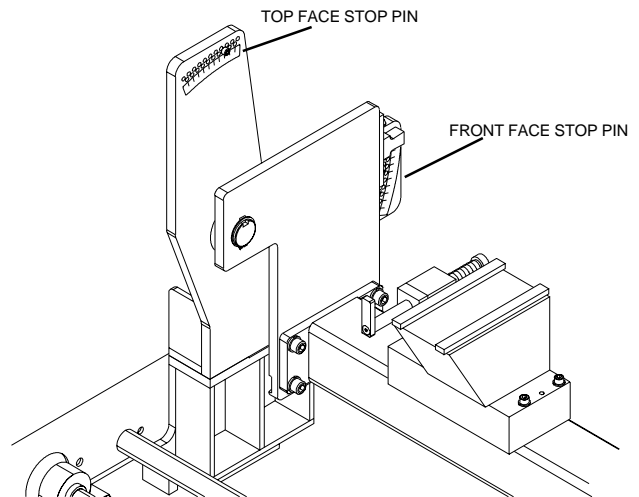


FIG. 20

OPERATING INSTRUCTIONS (Continued)

MOUNTING A BEDKNIFE FOR GRINDING (Continued)

Mount the Bedknife

1. Pull both gage tips forward and rotate to lock into position. Loosen the magnet lock knob and on the right side magnet assembly. See FIG. 21. Set the bedknife / bedbar assembly to be ground on the electromagnets. Move the right side magnet assembly until the alignment gage tips are at both ends of the bedknife, then tighten the right side magnet lock knob enough to secure the magnet.
2. Check the right side adjuster. The dial indicator should read .500. If not, loosen the lock tee knob and, adjust the handwheel until the dial indicator reads .500 and lock the tee knob. See FIG. 22.
3. Position the bedknife so the unworn tips on a used bedknives or the ends of a new bedknife are on the gage tips. See FIG. 23 Pull the bedknife forward firmly against the gage tip and then turn on the electromagnets. See FIG. 24. The red light will come "on" on the control panel. Turn and park both alignment gage tips.

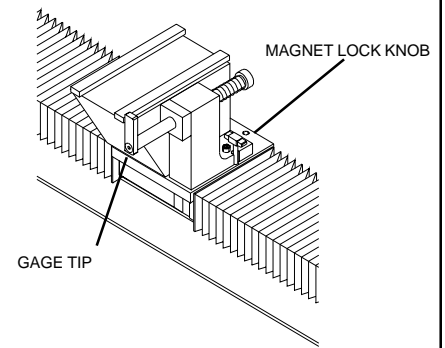


FIG. 21

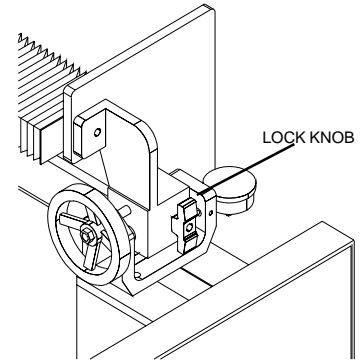


FIG. 22

BEDKNIVES WITH DUAL CUTTING EDGES

Some mowing unit manufacturers and some after market bedknife manufacturers make a bedknife with Dual Cutting Edges as shown in FIG. 24 A.

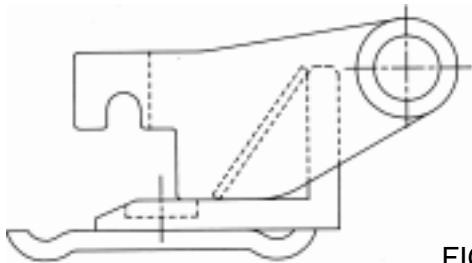


FIG. 24 A

Because of the two radiused surfaces that these bedknives present to the Electromagnets there is minimal holding force.

Therefore, to achieve a solid hold with the Electromagnets, you must file the bottom side of the bedknife with a flat bastard file as shown in Fig 24 B.

You must file with a uniform stroke across both radius: File until you have developed flats on the radius that are a minimum of 3/32(.09) [2.3mm] wide and uniform in width for the length of the magnet on each end of the bedknife.

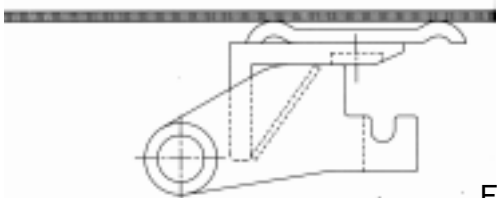


FIG. 24 B

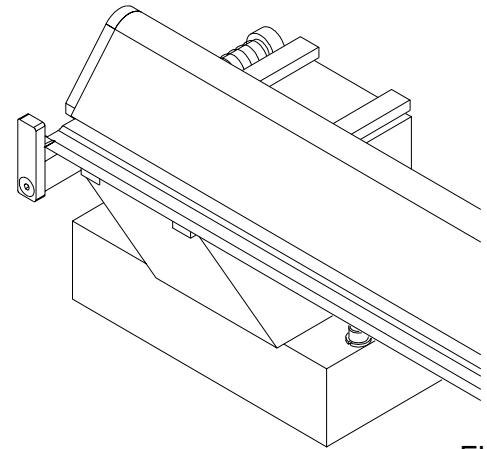


FIG. 23

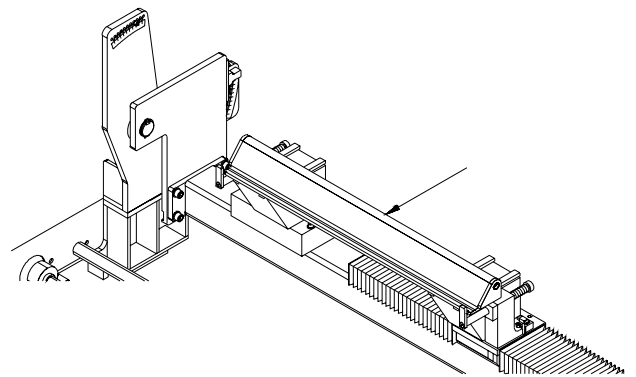


FIG. 24

OPERATING INSTRUCTIONS (Continued)

ALIGNING TO A WORN BEDKNIFE

This alignment method is different than the alignment detailed on page 17 in that in this alignment you are aligning the worn bedknife faces to the grinding head traverse.

The reason for using this method is that some bedknives are worn unevenly primarily due to the reel adjustments. To get the maximum life from these bed knives and remove the least stock, you may want to grind them using the established surfaces as the alignment.

SOME REEL ASSEMBLIES, ESPECIALLY ON GREENS MOWERS, HAVE A MINIMAL ADJUSTMENT RANGE. BE SURE THE MISALIGNMENT YOU USE IS WITHIN THE RANGE OF THE REEL ASSEMBLY SO YOU CAN ACHIEVE PROPER REEL TO BEDKNIFE ADJUSTMENT.

This is accomplished by touching the grinding wheel to the worn bedknife.

THE BEDKNIFE MAY SLIDE ON THE ELECTROMAGNETS IF YOU INFEEED THE GRINDING WHEEL EXCESSIVELY.

With the bedknife / bedbar mounted per procedure on page 17 and in the front face grinding position. Move the grinding head to the left end of the bedknife. Now adjust the carriage infeed handwheel until the wheel *just* touches the bedknife inside the unworn end nib. See FIG. 25.

Next, move the grinding head to the right end of the bedknife. Now without moving the grinding head infeed, loosen the lock tee knob and adjust the tooling bar right side adjuster until the grinding wheel *just* touches the bedknife inside the unworn end nib. See FIG. 26. Because when you adjust the right side, the left side also moves a small amount, you should go to the left and right sides several times to verify that you *just* contact the knife at both ends.

Now lock the lock tee knob on the right side adjuster and check the dial indicator. The dial indicator reading difference from .500 is the amount you have adjusted the grind out of correct alignment. Make certain that this setting is within the range of adjustment of your mowing unit. (If not, a compromise offset will be required.)

Grind the front face per the instructions on Page 19 and 20.

Then, rotate the tooling bar to the Top Face position and repeat the above procedure to offset the Top Face. Grind the top face per the instructions on Page 21-24.

GRINDING WHEEL AT LEFT END OF BEDKNIFE

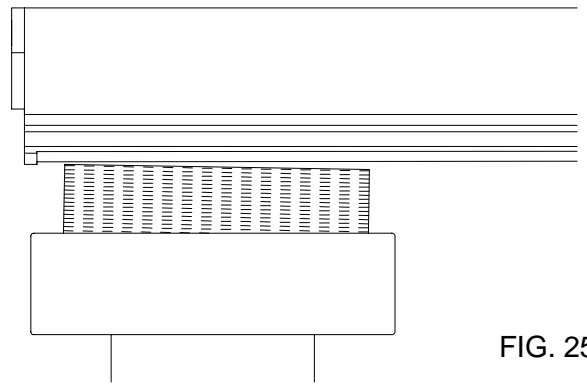


FIG. 25

GRINDING WHEEL AT RIGHT END OF BEDKNIFE

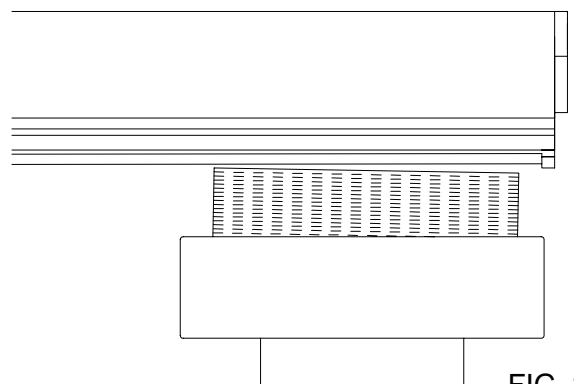


FIG. 26

YOU MUST RETURN THE TOOLING ASSEMBLY RIGHT SIDE ADJUSTER BACK TO THE .500 POSITION FOR THE NEXT BEDKNIFE OR YOU WILL GRIND IT INCORRECTLY

OPERATING INSTRUCTIONS (Continued)

GRINDING THE FRONT FACE

NOTE: The following instructions presume that you have already studied all previous sections of this manual.

NOTE: On some mower bedknives, the front face is curved and therefore may not have to be sharpened.

Position the Head for Front-Face Grinding (See Fig. 27)

If you have not preset the front face angle and top face angle stops, do so at this time per the procedure on page 16. Rotate the tooling assembly to the front face position (down).

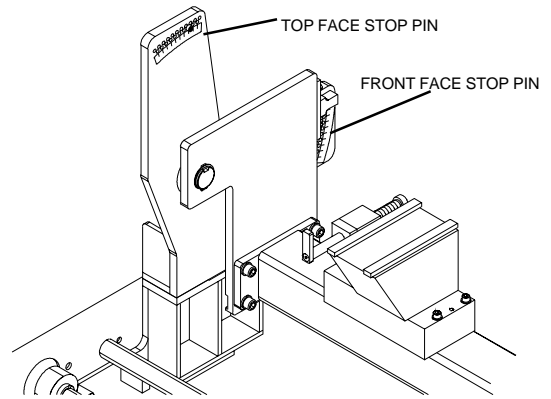


FIG. 27

Check Clearances and Set Traverse Limits

Position the grinding head so that the grinding wheel just touches the front face of the bedknife. With the vertical cam and lock lever, adjust the grinding head so the grinding wheel rim extends 1/2" [12mm] or as much as possible above the front face to be ground. See FIG. 28.

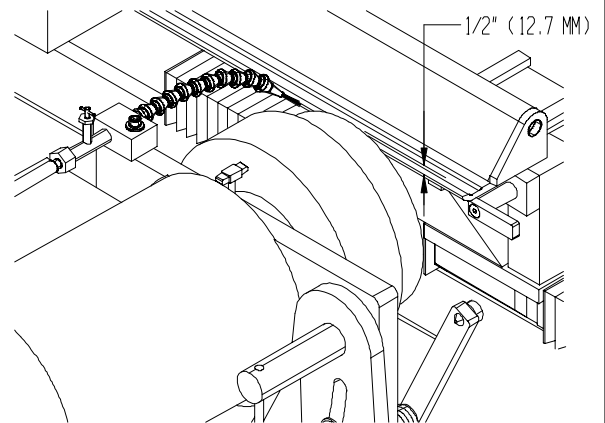


FIG. 28

! IF THE GRINDING WHEEL RIM DOES NOT EXTEND OVER THE BEDKNIFE FACE, IT WILL WEAR UNEVENLY AND CAUSE GROOVES ACROSS THE SURFACE OF THE BEDKNIFE.

Check for interference:

1. Back out the grinding head so the wheel no longer touches the front face of the bedknife.
2. Slide the left and right proximity switches to the far ends of the rail. Leave their knobs loose.
3. Set the TRAVERSE knob at 4 - 5 FT./MIN. Set the CARRIAGE TRAVERSE switch ON. Traverse the carriage to the left until the contact area of the grinding wheel is about 1" beyond the area to be ground on the bedknife, then turn the traverse potentiometer to zero. Be prepared to STOP the traverse earlier if there is any interference between the grinding wheel and the bedbar.

With the carriage still in the position determined in Step 3 above, slide the left proximity switch in until its LED lights, then tighten the proximity bracket knob.

Traverse back to the right until the grinding wheel reaches the point where it covers the entire area to be ground and goes past that point by 1" [25 mm] or more if possible. Then set the right proximity switch in the same manner.

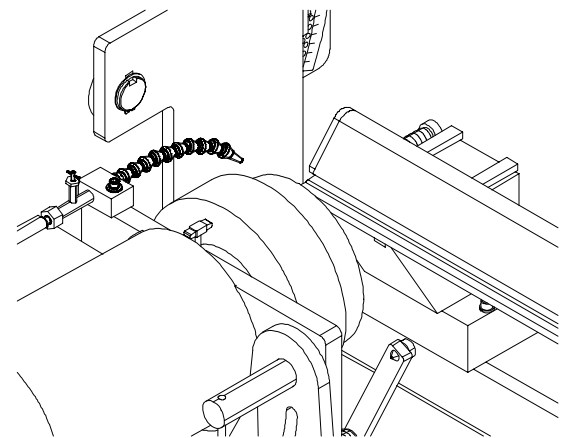


FIG. 29

NOTE: The area of the grinding wheel which contacts the bedknife is on the left side of the wheel. When grinding the left end of the bedknife, the area of the wheel which doesn't contact the bedknife will still be over the bedknife. See FIG. 29. When you go to the right end of the Grinder, the wheel traverses completely off the bedknife.

Infeed the grinding wheel until it very lightly touches the bedknife on the left side. Now traverse to the right end of the bedknife to assure that the right side is not closer to the grinding wheel. Back the wheel out if necessary until you can traverse full length with a very light touch at the closest point.

OPERATING INSTRUCTIONS (Continued)

GRINDING THE FRONT FACE (Continued)

Grind the Bedknife

When you are satisfied with the grinder head travel, begin grinding:



**REFER TO THE
"SAFETY RULES WHEN GRINDING"
ON PAGE 3.**

NOTE: During the grinding process, watch the spark pattern for the full length of grind, the sparks should look equal for the full length of grind.

1. With the guard door closed, set the GRINDING WHEEL switch at ON.
2. Set the COOLANT PUMP switch at ON, and check that the nozzle is directing coolant onto the bedknife. See FIG. 17.
3. Set the TRAVERSE knob at about 12 FT/MIN.

NOTE: If an excessive amount of metal stock will have to be removed on one end of the bedknife, recheck your setup first and then the straightness of the bedknife. If it is bowed or twisted, replace it.

4. Set the carriage traverse switch ON. With the horizontal infeed handwheel crank the grinding head in (clockwise) until the wheel is removing metal lightly from the bedknife. It is recommended to take off about .002 to .003" [.05 to .075 mm] per pass.

NOTE: The horizontal adjustment dial is calibrated in .002" [.05 mm] increments.

5. Continue grinding the bedknife in this manner until you are satisfied with the front face grind. Dress the wheel when necessary. (see "Dressing the Grinding Wheel" on Page 13)
6. Dress the wheel before the final **spark out** grind. For spark out procedure, see the top of page 23.

By partially grinding both surfaces, the top face and the front face, as shown in FIG. 30, you will sharpen a used bedknife with the least metal removal. FIG. 30 also shows how much stock would be removed if you ground the top face surface until sharp. Partially grinding both surfaces is the preferred method for life utilization of the bedknife.



FIG. 30



**SHUT OFF THE COOLANT PUMP SWITCH
BEFORE YOU SHUT OFF THE GRINDING
WHEEL, TO ALLOW THE WHEEL TO SPIN DRY.
IF THE WHEEL RETAINS TOO MUCH COOLANT,
IT WILL BE UNBALANCED WHEN YOU AGAIN
TURN ON THE GRINDING MOTOR.**

OPERATING INSTRUCTIONS (Continued)

GRINDING THE TOP FACE

NOTE: The following instructions presume that you have already studied all previous sections of this manual.

Position the Head for Top-Face Grinding (See Fig. 31)

When rotating from front face grinding to top face grinding, the grinding head must be backed out two full turns. If you have not preset the top face angle, do so at this time per the procedure on Page 16. Rotate the tooling assembly to the top face position (up).

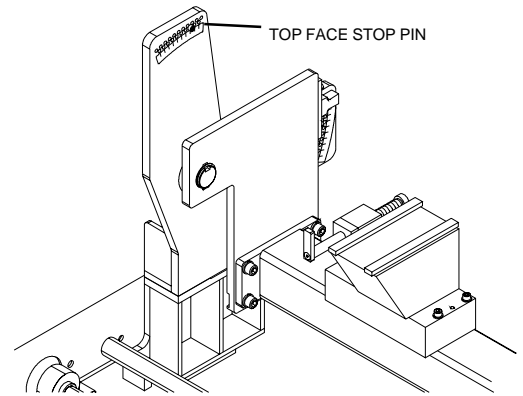


FIG. 31

BECAUSE ELECTROMAGNETIC ENERGY IS HOLDING THE BEDKNIFE IN THIS VERTICAL POSITION. DO NOT LEAVE THE BED KNIFE IN THIS POSITION FOR EXTENDED PERIODS OF TIME. IF THE POWER WOULD INTERRUPT, THE STANDBY POWER SUPPLY WILL HOLD THE BEDKNIFE FOR APPROXIMATELY 10 MINUTES, THEN THE BEDKNIFE WILL FALL.

Check Clearances and Set Traverse Limits

Position the grinding head so that the grinding wheel *just* touches the top face of the bedknife. Check to see if the rim of the grinding wheel is extended 1/2" [50mm] above the top face of the grinding wheel. If you have previously ground the front face it most often will be correct. If not, with the vertical cam and lock lever, adjust the grinding head. See Fig. 32. If the shape of the bedbar interferes with the wheel guard or grinding wheel you will need to make adjustments per page 15.

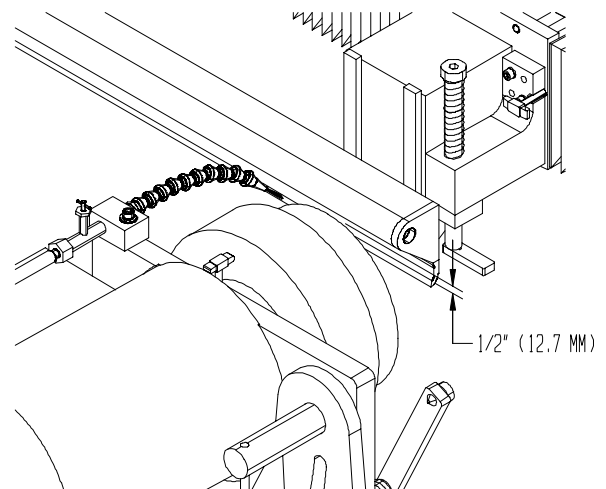


FIG. 32

IF THE GRINDING WHEEL RIM DOES NOT EXTEND OVER THE BEDKNIFE FACE, IT WILL WEAR UNEVENLY AND CAUSE GROOVES ACROSS THE SURFACE OF THE BEDKNIFE.

Check for interference:

1. Back out the grinding head so the wheel no longer touches the top face of the bedknife.
2. If you have just ground the front face the travel limit should still be correct, but you should still verify no interferences as described below. If you did not grind the front face, follow the full procedure listed below. Slide the left and right proximity switches to the far ends of the rail. Leave their knobs loose.
3. Set the TRAVERSE knob at 4 - 5 FT/MIN. Set the CARRIAGE TRAVERSE switch ON. Traverse the carriage to the left until the contact area of the grinding wheel is about 1" beyond the area to be ground on the bedknife, then turn the traverse potentiometer to zero. Be prepared to STOP the traverse earlier if there is any interference between the grinding wheel and the bedbar.

With the carriage still in the position determined in Step 3 above, slide the left proximity switch in until its LED lights, then tighten the proximity bracket.

OPERATING INSTRUCTIONS (Continued)

GRINDING THE TOP FACE (Continued)

Traverse back to the right until the grinding wheel reaches the point where it covers the entire area to be ground and goes past that point by 1" [25 mm] or more if possible. Then set the right proximity switch in the same manner.

NOTE: The area of the grinding wheel which contacts the bedknife is on the left side of the wheel. When grinding the left end of the bedknife, the area of the wheel which doesn't contact the bedknife will still be over the bedknife. See FIG. 33. When you go to the right end of the Grinder, the wheel traverses completely off the bedknife.

Infeed the grinding wheel until it very lightly touches the bedknife on the left side. Now traverse to the right end of the bedknife to assure that the right side is not closer to the grinding wheel. Back the wheel out if necessary until you can traverse full length with a very light touch at the closest point.

Grind the Bedknife

When you are satisfied with the grinding head travel, begin grinding:



**REFER ALSO TO THE
"SAFETY RULES WHEN GRINDING" ON
PAGE 3.**

NOTE: At this point you won't know the condition of the grinding wheel after the previous job. Always dress the wheel before grinding. See Page 12.

1. With the guard door closed, set the GRINDING WHEEL switch at ON.
2. Set the COOLANT PUMP switch at ON, and check that the nozzle is directing coolant onto the bedknife. See FIG. 18.
3. Set the TRAVERSE knob at about 12 FT/MIN.

NOTE: If an excessive amount of metal stock will have to be removed on one end, recheck your setup first and then check the straightness of the bedknife. If it is bowed or twisted, replace it.

4. Set the carriage traverse switch at on. With the horizontal infeed handwheel, crank the head in (clockwise) until the grinding wheel is removing metal lightly from the bedknife. It is recommended to take off about .002 to .003" [.05 to .075 mm] per pass during the rough grind.

NOTE: The horizontal adjustment dial is calibrated in .002" [.05 mm] increments.

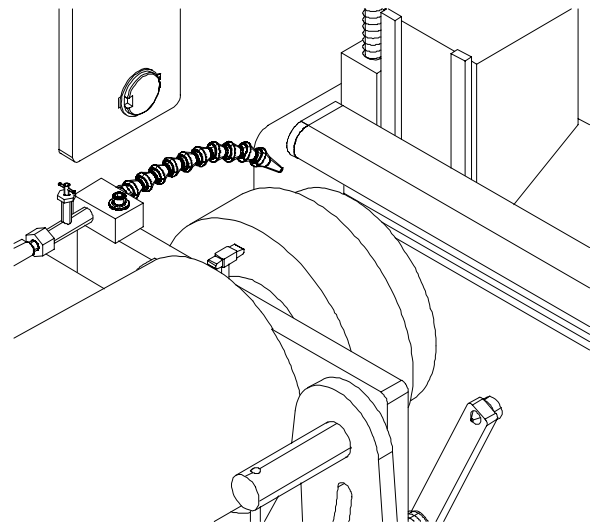


FIG. 33

5. Continue grinding the bedknife in this manner until you are satisfied with the top face grind. Dress the wheel when necessary. (See "Dressing the Grinding Wheel" on page 13).

During the grinding process, watch the spark pattern for the full length of grind, the sparks should look equal for the full length of grind.

6. Dress the wheel before making the final **spark out** grind.

OPERATING INSTRUCTIONS (Continued)

GRINDING THE TOP FACE (Continued)

On the spark out passes, crank the grinding head in (clockwise) only about .001" [.025 mm] and then let the grinding wheel spark out. For sparking out, always traverse the grinding head 10 - 20 passes without cranking the grinding head in further. To get the finest top-face grind, set the TRAVERSE knob at slow speed (about 5 FT/MIN) for this final grinding sparkout. This process improves the surface finish of the grind and improves the grind quality.

NOTE: What you are looking for is a "near sparkout" - about a 99% reduction in grinding spark from a normal grind. Don't continue sparking out until you have **no sparks**, because this could be an extremely long time.



SHUT OFF THE COOLANT PUMP SWITCH BEFORE YOU SHUT OFF THE GRINDING WHEEL, TO ALLOW THE WHEEL TO SPIN DRY. IF THE WHEEL RETAINS TOO MUCH COOLANT, IT WILL BE UNBALANCED WHEN YOU AGAIN TURN ON THE GRINDING MOTOR.

If after grinding, when the bedknife / bedbar assembly is installed in the mowing unit and it does not appear to be ground straight, the right side adjuster on the tooling bar should be verified to be perfectly straight to the grinding head traverse rails.

To verify, use the **optional** Magnetic Base Dial Indicator (Part no. 6100501). Set the top face angle pin at 0 degrees and rotate the tooling assembly to the top face grind position. Install the magnet base on the top of the motor with the arm extended so the dial indicator touches the electromagnet face. See Fig. 34. Disengage the traverse actuator with the release lever. Slide the grinding head from magnet to magnet. The dial indicator on the magnetic base should read zero (No change from magnet to magnet). If it does not, loosen the right side tooling bar adjuster lock tee knob and then adjust the right side adjuster hand-wheel until you get zero / zero across the two magnets. When this is achieved, relock the tee knob. Now, adjust the machine dial indicator which is mounted to the right side tooling adjuster so it reads .500. This is done by loosening the setscrew that holds the dial indicator, repositioning the indicator and retightening the setscrew. Bedknives ground with this setting, (The same as the factory original setting.) should be correct.

REMOVING THE BEDKNIFE

Remove the bedknife by rotating the tooling assembly to the front face grinding position (down). Grasp the bedknife and turn off the electromagnet. If the next bedknife to be ground is the same type and size as the previous, simply mount it and proceed.

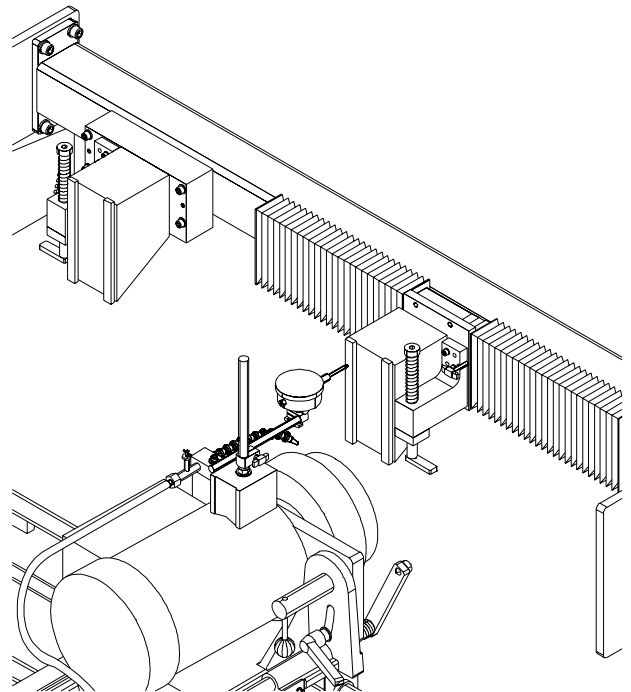


FIG. 34