

6000555

BEDKNIFE GRINDING

ATTACHMENT

FOR THE MODEL 600 SPIN/RELIEF GRINDER

ASSEMBLY

OPERATING

MAINTENANCE

INSTRUCTIONS

AND PARTS LIST



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 back lapper in damp or wet locations. Machine is for indoor use only. Keep work area well lit.
5. **KEEP ALL VISITORS AWAY.** All visitors should keep a safe distance from work area.
6. **MAKE WORK AREA CHILD-PROOF** with padlocks or master switches.
7. **DON'T FORCE THE BACK LAPPER.** It will do the job better and safer if used as specified in this manual.
8. **USE THE RIGHT TOOL.** Don't force the back lapper 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.** Mount the cutting unit in place before back lapping as prescribed in the operators manual.
12. **DO NOT OVERREACH.** Keep proper footing and balance at all times.
13. **MAINTAIN BACK LAPPER WITH CARE.** Follow instructions in Service Manual for lubrication and preventive maintenance.
14. **DISCONNECT POWER BEFORE SERVICING.**
15. **REDUCE THE RISK OF UNINTENTIONAL STARTING.** Make sure the switch is OFF before plugging in the back lapper.
16. **USE RECOMMENDED ACCESSORIES.** Consult the manual for recommended accessories. Using improper accessories may cause risk of personal injury.
17. **CHECK DAMAGED PARTS.** A guard or other part that is damaged or will not perform its intended function, should be properly repaired or replaced.
18. **NEVER LEAVE BACK LAPPER RUNNING UNATTENDED. TURN POWER OFF.** Do not leave back lapper until it comes to a complete stop.
19. **KNOW YOUR EQUIPMENT.** Read this manual carefully. Learn its application and limitations as well as specified potential hazards.
20. **KEEP ALL SAFETY DECALS CLEAN AND LEGIBLE.** If safety decals become damaged or illegible for any reason, replace immediately. Refer to replacement parts illustrations in Service Manual for the proper location and part numbers of safety decals.
21. **DO NOT OPERATE THE BACK LAPPER WHEN UNDER THE influence of drugs, alcohol, or medication.**

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SAFETY INSTRUCTIONS



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

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

DO

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

DON'T

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



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

ASSEMBLY INSTRUCTIONS

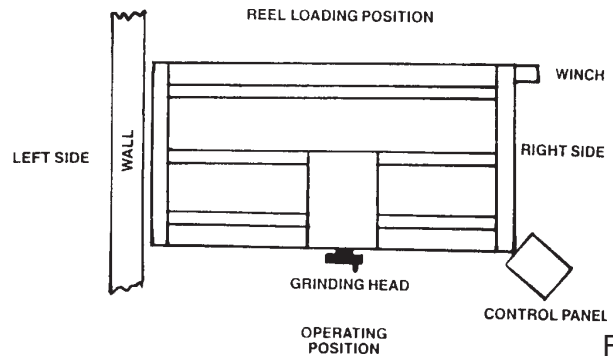
UNPACK CARTON

Remove all items from the carton and sort out on a table.

Check all items against the exploded view drawings in the rear of the manual to ensure that all items were shipped properly. If any problems occur, refer to the Shipping and Receiving Instructions included with your grinder.

OPERATOR AND REEL LOADING POSITION

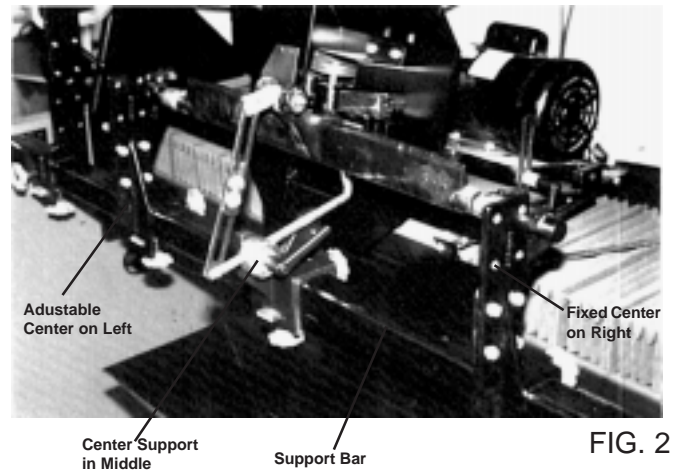
Before proceeding with the assembly instructions, review FIG. 1 to correctly identify the operator's position and the reel loading position.



MOUNT CENTERS AND CENTER SUPPORT

Loosely mount the two centers and center support onto the tooling support bar. See FIG. 2. As viewed from the reel loading position, mount the adjustable center on the left end, the fixed center on the right end and the center support in the middle between the adjustable and fixed centers. Final positioning of the centers will occur in the operating instructions.

NOTE: The adjustable center and fixed center are part of the 600 grinder. The center support is included with this attachment.



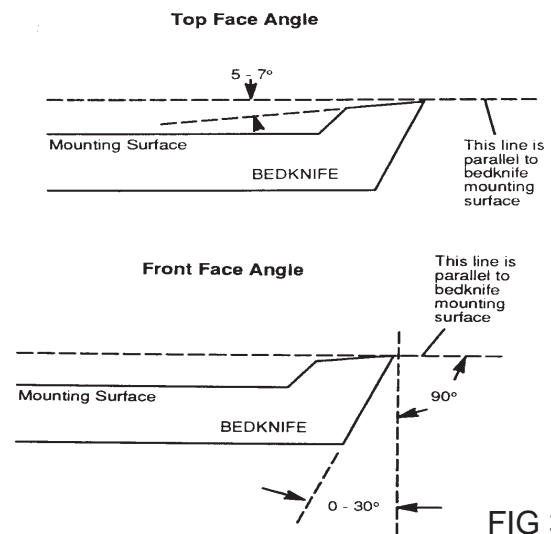
GENERAL INFORMATION

BEDKNIFE GRINDING ANGLES

The bedknife has two faces, the top face and the front face. The top and front face angles will vary depending on the manufacturer. There is usually a 5 - 7° clearance angle on the top face and a 10 - 30° clearance angle on the front angle.

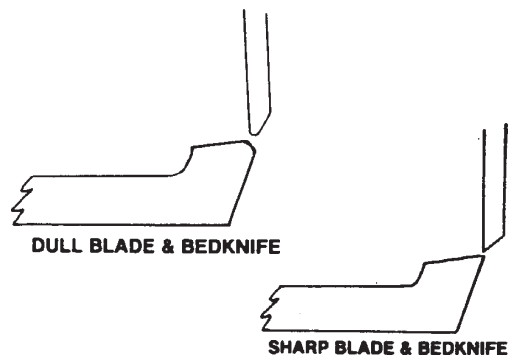
New bedknives should be ground before being put into use.

This attachment will be sharpening the top face angle only.



WHEN DOES THE BEDKNIFE NEED SHARPENING?

To fully sharpen a reel mower, you need to grind the reel blade and reshape the cutting edge of the bedknife. 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. 4. The objective is to restore the match between the reel blades and the cutting edge of the bedknife.



GENERAL INFORMATION

STRAIGHTNESS OF GRIND IS IMPORTANT

The straightness of grind is important. For example, if a low spot was ground into the bedknife, excessive lapping of the high points would be required to correctly match the bedknife to the reel blade. To check straightness, use dial indicator and magnetic base. See FIG. 5.

The optional dial indicator is to be mounted onto the carriage with the dial indicator arm on the ground surface of the bedknife. Traverse carriage to check straightness of bedknife. Traverse carriage to check straightness of bedknife (maximum .001" reading each 12" length--total maximum reading full length is .002"). This assures the ground face is as accurate as the machine rails.

NOTE: This sections refers to the accuracy of a completed bedknife after spark out.

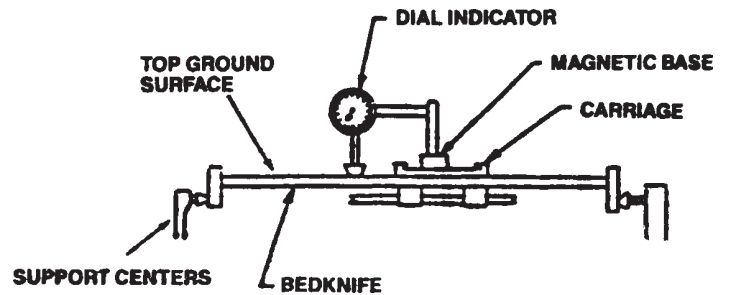


FIG. 5

ALIGNMENT OF BEDKNIFE TO THE GRINDING WHEEL IS IMPORTANT

Your Model 600 Spin/Relief Grinder comes equipped with an alignment gauge that aligns the bedknife mounting points parallel with the grinding wheel. This alignment is critical to allow for maximum bedknife to reel adjustment. For some reels to bedknife, there is as little as .060 movement for allowable adjustment. The centers are to be parallel to the traversing rails within .005/.010". The height is to be within .005/.010". (The height control is the most critical to hold.)

Any bedknife misalignment from bedknife mounting holes to top ground surface takes away from maximum usable reel adjustment. Therefore, correct alignment should always be checked before grinding.

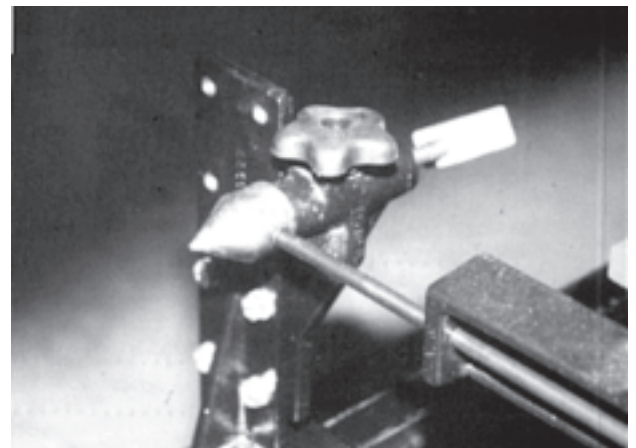


FIG. 6

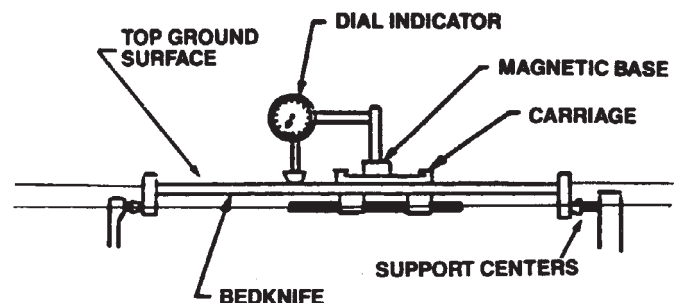


FIG. 7

OPERATING INSTRUCTIONS

MOUNT THE GRINDING WHEEL

Unlock the grinding wheel head adjustable handle. Pull the spring loaded position locking pin. Rotate 90° counter clockwise (looking from normal operating position) locking into the next locating groove. See FIG. 8A and 8B. Mount the grinding wheel as shown in the diagram. The wheel guard and spark deflector must be mounted as shown in the diagram to comply with OSHA Regulations and for safe operation. The wheel guard must be fastened down with the two wing screws. See FIG. 8A.

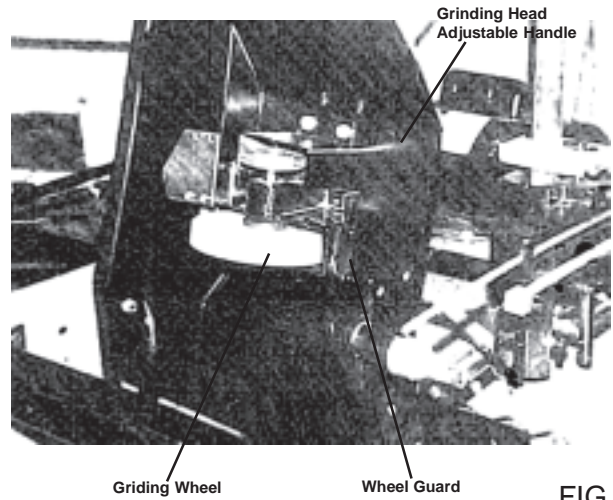
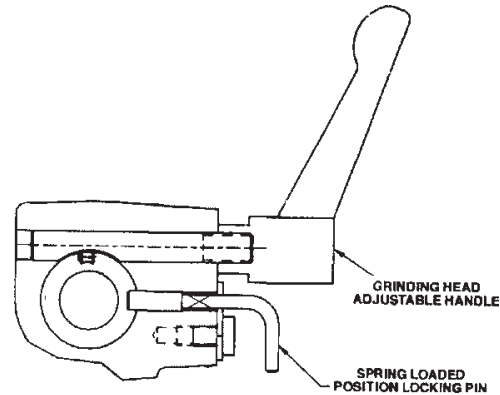


FIG. 8A

THE FLANGE ON A GRINDING WHEEL SHOULD ONLY BE SNUGGLY FINGER TIGHT. DO NOT TIGHTEN WITH A WRENCH. TIGHTENING WITH A WRENCH CAN CAUSE WHEEL BREAKAGE. REPLACE ALL CRACKED WHEELS IMMEDIATELY. ALWAYS USE GUARDS AND EYE SHIELDS. USE ONLY FLANGES FURNISHED WITH THE GRINDER.



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



VIEW LOOKING INTO THE GRINDING WHEEL GUARD

FIG. 8B

CLEAN THE GRINDING WHEEL

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



USE ONLY FLARE OR STRAIGHT CUP TYPE GRINDING WHEELS. ALWAYS GRIND ON THE FACE.

OPERATING INSTRUCTIONS

INSPECT THE BEDKNIFE

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

MOUNT THE BEDKNIFE

1. Firmly lock the adjustable center at least 20-1/2" from the left end of the support bar. As viewed from the reel loading position. See FIG. 9. This will leave enough room for the alignment gauge to be positioned against the left end of the bedknife in later operating steps.
2. Measure the length of the bedknife and slide the fixed center that distance away from the adjustable center.
3. Mount the bedknife between the two centers and firmly lock the fixed center in place.
4. Turn the adjustment knob on the adjustable center until the bedknife is firmly mounted between the centers. When complete, lock the adjustable center locking knob. See FIG. 10.



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

ADJUST THE BEDKNIFE SUPPORT BAR AND LOCK IN PLACE

Adjust the bedknife support bar so that the top face to be ground is held at an angle of approximately 15 - 20° from horizontal plane. See FIG. 11B. With the blade down at this angle, there will be very little vertical or horizontal adjustment of the bedknife required to match the grinding wheel to the top surface. This position is arbitrary only. The grinding head clearance to motor base will determine final adjustments.

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



THE CENTERS SUPPORT MUST BE LOCKED SECURELY TO THE SUPPORT BAR. ANY LOOSENESS WILL ADVERSELY AFFECT GRIND QUALITY.

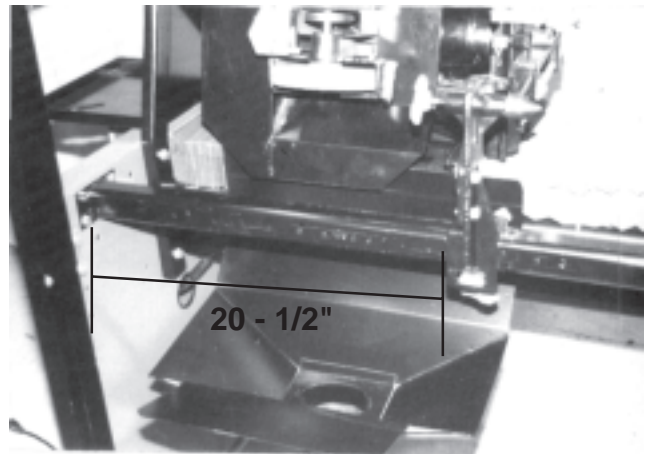


FIG. 9

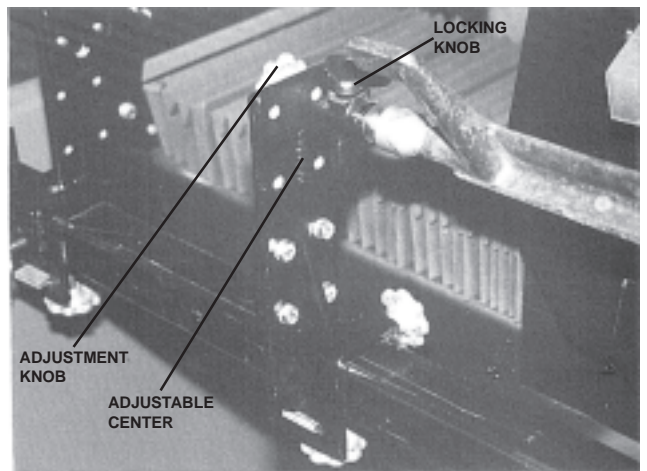


FIG. 10

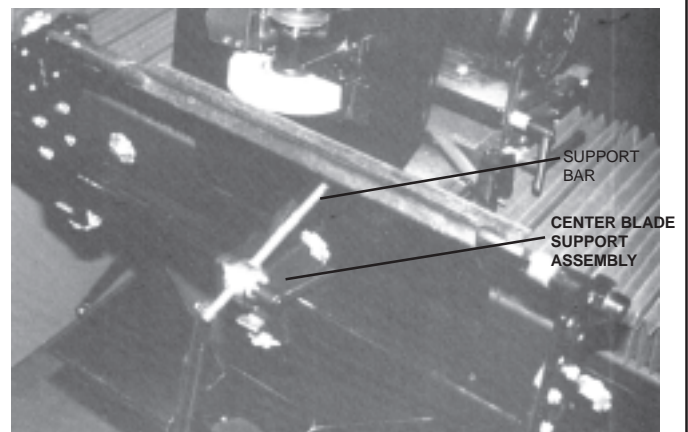


FIG. 11A

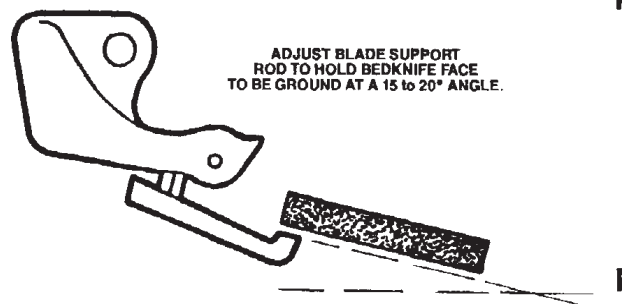


FIG. 11B

OPERATING INSTRUCTIONS

BEDKNIFE ALIGNMENT

Before grinding, the bedknife surface must be aligned perfectly to the grinding wheel travel. This is accomplished by adjusting the vertical and horizontal handwheels in conjunction with the alignment fixture using the same procedures for reel alignment found in the Model 600 Operator's Manual. See FIG. 12 and 13.

Align the grinding wheel travel to the bedknife surface at this time by referring to the photos below and to the Alignment Fixture Adjustment Section in your Model 600 Operating Manual for detailed instructions.

Final alignment is begun by placing alignment rod over the two (2) centers as shown in FIG. 14 and FIG. 15 and adjusting bedknife vertically within .010. The horizontal adjustment is more critical than the vertical adjustment.

Final alignment is completed by placing alignment rod against the front side of each center. See FIG 16 and 17. Horizontal adjustment is to be within .005.

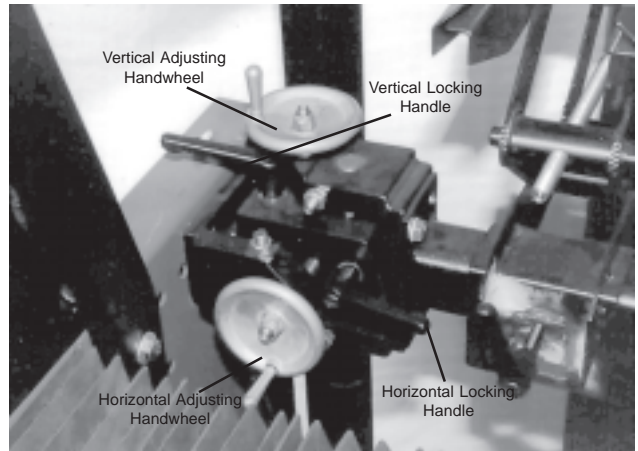


FIG.12

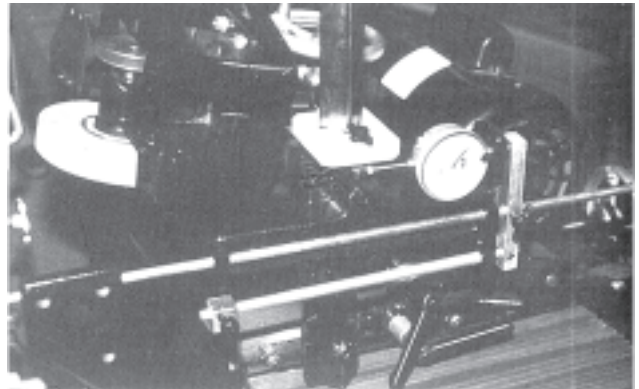


FIG.13

--VERTICAL ADJUSTMENT--



FIG. 14

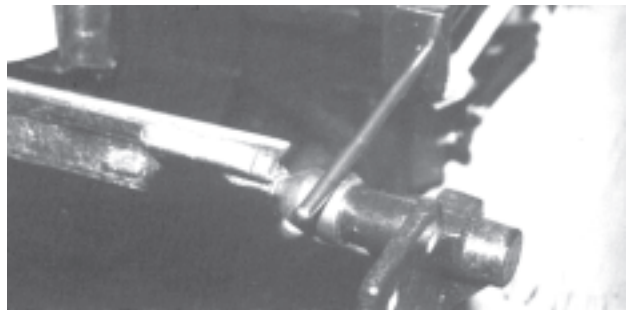


FIG. 15

--HORIZONTAL ADJUSTMENT--

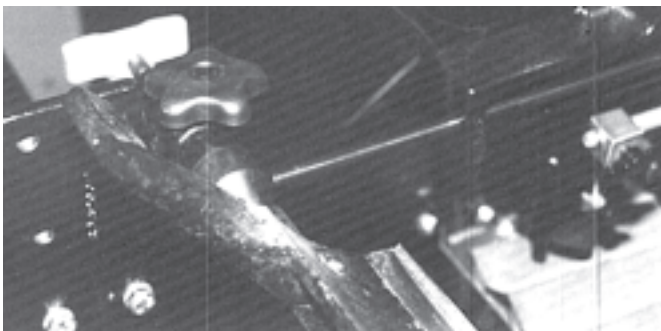


FIG.16

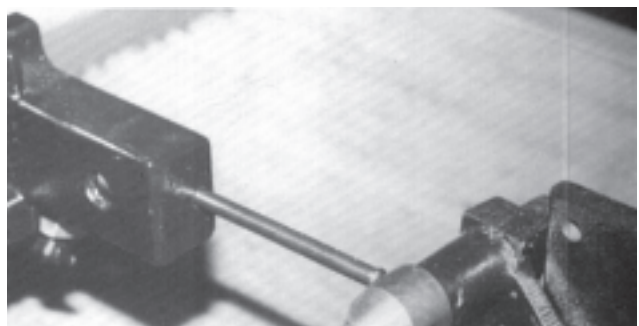


FIG. 17

OPERATING INSTRUCTIONS

MATCH GRINDING WHEEL TO BEDKNIFE SURFACE

Handcrank the vertical and horizontal motorhead adjustment knobs (See FIG 19) until grinding wheel roughly matches the face of the bedknife, just covers the surface to be ground and the inside of the grinding wheel rim is extended over the bedknife top surface being ground by 1/2" [.500]. See FIG. 19, 20, 21A, 21B, and 21C. Match the grinding wheel face to the bedknife angle. Both the grinding head and bedknife center support will have to be adjusted to match angles. Hand rotate the grinding wheel to scratch the bedknife top face if a more exact angle is required. (Refer to page 6 for top face angle discussion.)

When the grinding wheel cannot extend over the bedknife surface, dress the grinding wheel more often. When matched, raise the grinding wheel away from the bedknife surface.

Set the proximity switches on each end of the bedknife so that the grinding wheel will be able to travel the complete length of the bedknife and beyond, without grinding into the centers on each end. Set the traverse speed knob to zero, turn on the traverse on/off switch, rotate traverse speed knob until the grinding head is traversing at a slow speed. Watch the grinding head as it takes several complete passes to ensure that the grinding wheel is traveling the complete length of the bedknife but not touching either center on each end. When satisfied with the grinding head travel, turn on the grinding wheel, crank the vertical feed adjustment handwheel down until the grinding wheel is lightly removing metal from the bedknife. It is recommended to take off approximately .001" per pass. Continue grinding the bedknife in this manner until the grinding process is complete.

Infeed the grinding head for maximum .001" stock removal in final passes and let the grinding wheel spark out. For sparking out in grinding process, always traverse grinding head 12 - 20 passes with no grinding head infeed. Set traverse at a slow speed setting (approximately 4 to 8 feet per minute range) for final grinding spark out.

NOTE: This process refers to spark out, but what we are looking for is a near spark out, approximately a 99% reduction in grinding spark from normal grind. Do not run spark out until you have no sparks, because this could be an extremely extended period. Watch the sparks grinding pattern for the full length of grind. The sparks should look equal for the full length.

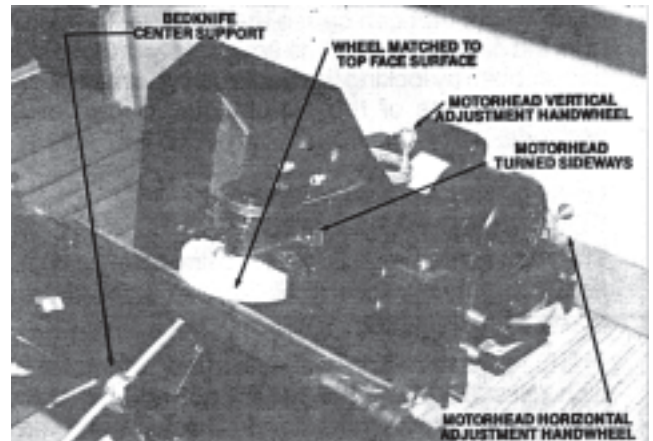


FIG. 19

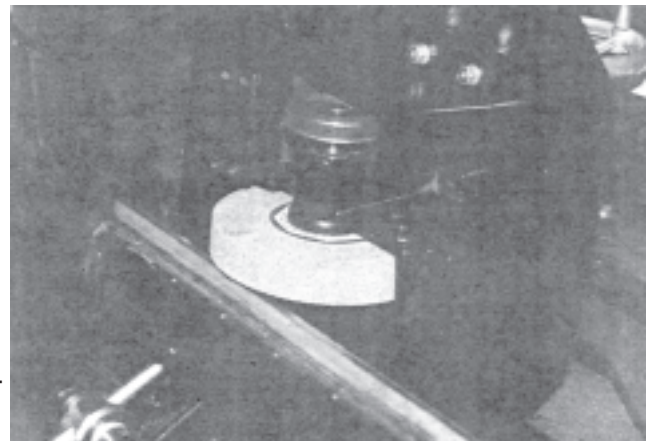
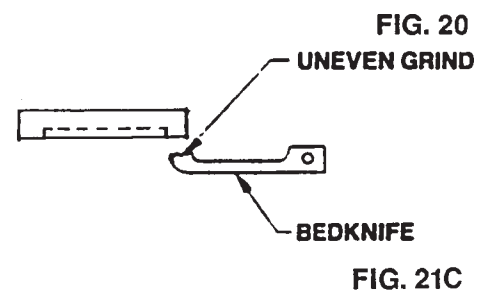
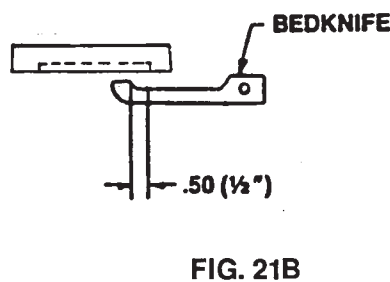
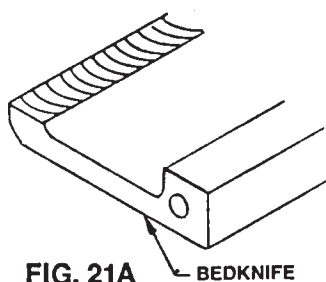


FIG. 20



OPERATING INSTRUCTIONS

ADJUSTING ARM LOCKS

The bedknife attachment comes complete with two adjusting arm locks. See FIG. 21, 22, and 23.

Some bedknives have a center support arm bracket. The adjusting arm locks (See FIG. 22) are used in situations where additional support is required between the center adjustment support arm bracket of the bedknife and the center bedknife support assembly on the Model 600. Four (4) adjusting arm locks come standard with the bedknife attachment. Two (2) long and two (2) short. The different arm lengths may be combined to give you the correct distance. Example: Two longs, two shorts, or one long with one short. Determine the correct length needed and connect at this time.

Mowers with center adjustment support arms have extra weight that can cause the bedknife to raise off from the center support, the adjusting arm locks solve this problem by locking the bedknife into an exact position regardless of the weight distribution of the bedknife.

USING A FLARE CUP WHEEL FOR ADDED CLEARANCE

The shape of some bedknives requires using a special flare cup grinding wheel to clear the end supports of the bedknife. See FIG. 24.

The flare cup wheel is available in a 6" diameter version (No. 3700067). For most applications, the 6" straight cup (provided as standard equipment) wheel is used.



FIG. 22

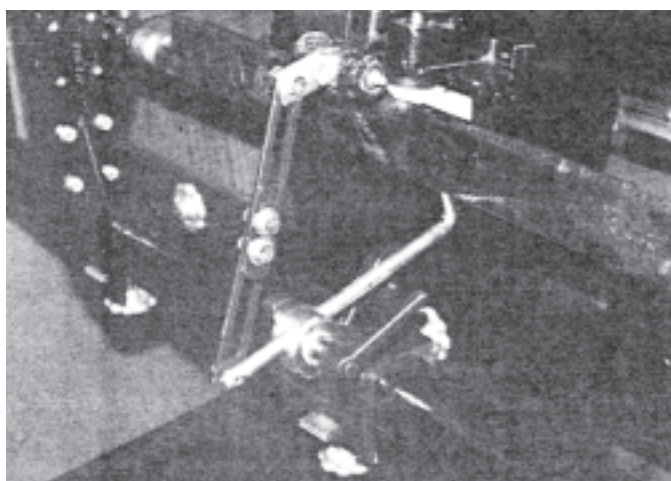
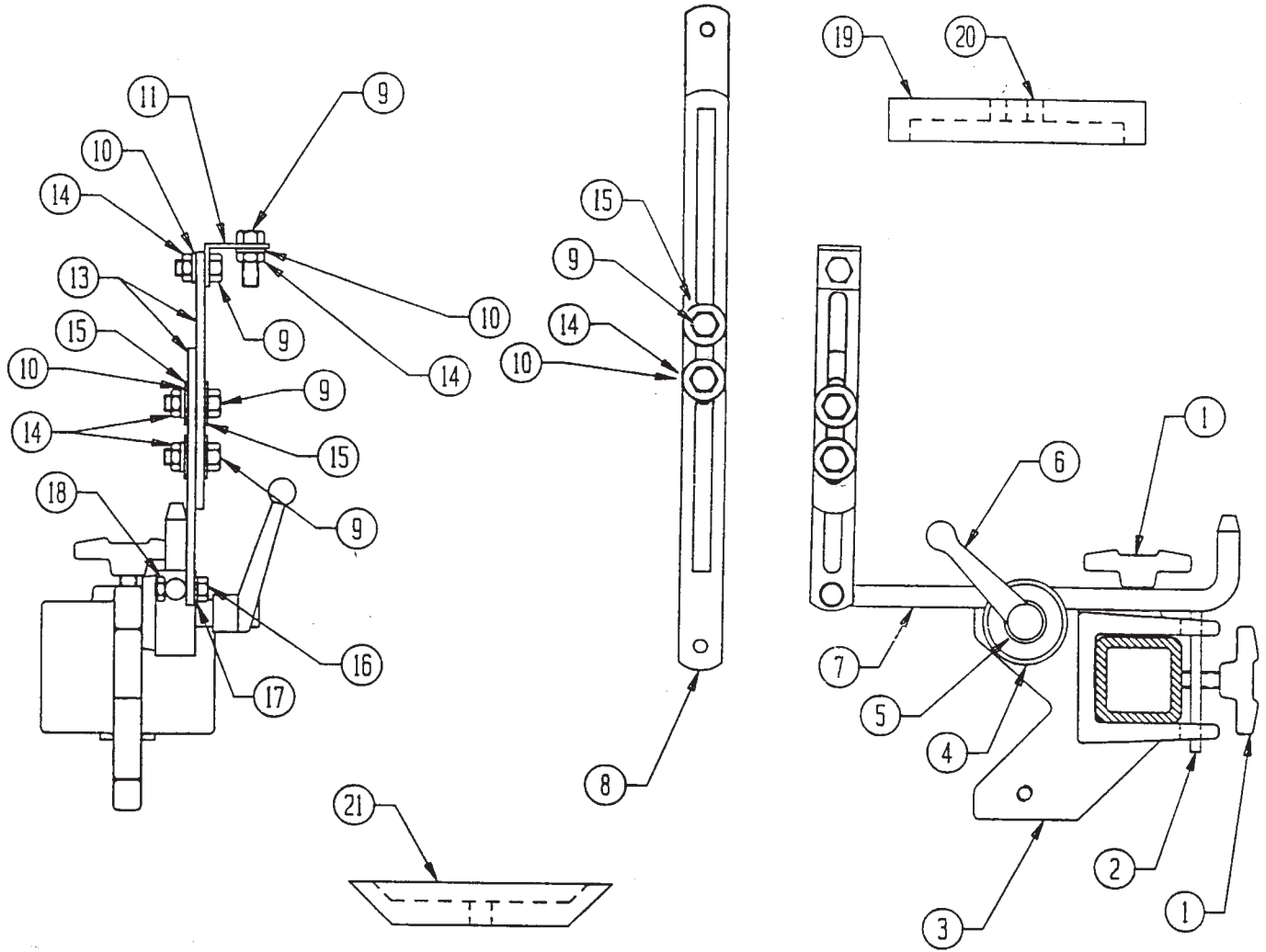


FIG.23

OPERATING INSTRUCTIONS



PARTS LIST FOR 6000555 BEDKNIFE ATTACHMENT KIT

1	6009555	Knob Assembly
2	3889066	Center Stand Lock
3	3969017	Mower Support
4	3849065	Pivot Cup
5	3849064	Support Bar Lock
6	3708561	Lock Handle
7	3849025	Support Bar
8	3649038	Adjusting Arm
9	B371601	HHDCS 3/8-16 x 1"
10	K371501	3/8 Split Lock washer
11	3849087	Angle Bracket
12	B311201	HHDCS 5/16-18 x 3/4" (Not Shown)
13	3969027	Adjusting Arm
14	J371000	3/8 Hex Nut
15	R000527	3/8 Flat Washer
16	B311601	HHDCS 5/16-18 x 1
17	R000470	5/16 Split Lock washer
18	J311000	5/16 Hex Nut
19	3700265	6 x 1 x 1-1/4" 60G VIT Ruby Cup
20	3700408	Bushing 1-1/4 OD x 1/2 ID
21	3700067	Flare Grinding Wheel 60 Grit VIT Ruby (Optional)

