

TM 9-3419-228-10

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR'S MANUAL

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SAW, BAND, METAL CUTTING FLOOR MOUNTING, 26 INCH THROAT DEPTH 26x26 WORK TABLE, TILT TYPE TABLE 220-VOLT, 60 CYCLE, 3 PHASE W/INTEGRAL BUTT WELDER (DoALL COMPANY, MODEL 2612-1M) (3419-542-1328)



HEADQUARTERS, DEPARTMENT OF THE ARMY
DECEMBER 1966

Change }
No. 1 }

HEADQUARTERS
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Washington, D. C., 21 May 1973

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Operator's Manual
SAW, BAND, METAL CUTTING
FLOOR MOUNTING, 26-INCH THROAT DEPTH
26X26 WORK TABLE, TILT TYPE TABLE
220-VOLT, 60-CYCLE, 3-PHASE
W/INTEGRAL BUTT WELDER
(DOALL COMPANY, MODEL 2612-1M)
(3419-542-1328)

TM 9-3419-228-10, 20 December 1966 is changed as follows:
Page 49, lower portion of page. Add the following paragraphs:

Reporting of Equipment Publication Improvements

The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to Publications) and forwarded direct to: Commander, US Army Weapons Command, ATTN: AMSWE-MAS-SP, Rock Island IL 61201.

Components of the End Item

Parts included with the end item and considered as components of the end item configuration are listed in the following table:

Table I. Components of the End Item

ADAPTER, GUIDE:
1371(18056)

ATTACHMENT, MITER:
55-304 (18056).

BACKUP, FILE GUIDE:
34-09312 (18056).

BACKUP, POLISHING GUIDE:
34-10402 (18056).

Table I. Components of the End Item — Continued

BAND, FILE:
311-126 (18056).
 BAND, FILE:
311-167 (18056).
 BAND, FILE: Half rd shape, bastard cut, 3/8 w, 171 lg, 16 teeth per in. V26 (18056).
 BAND, FILE: Oval shape, bastard cut, 1/4 w, 171 lg, 24 teeth per in. V26 (18056).
 BAND, FILE: Oval shape, bastard cut, 3/8 w, 171 lg, 10 teeth per in. V26 (18056).
 BAND, FILE: Oval shape, bastard cut, 3/8 w, 171 lg, 14 teeth per in. V26 (18056).
 BAND, FILE: Oval shape, bastard cut, 1/2 w, 171 lg, 10 teeth per in. V26 (18056).
 BAND, FILE: Oval shape, bastard cut, 1/2 w, 171 lg, 14 teeth per in. V26 (18056).
 BAND, POLISHING: 737-401208 (18056).
 BAND, POLISHING: 737-400754 (18056).
 BAND, POLISHING: 737-400309 (18056).
 BLADE, BAND SAW: 306-084 (18056).
 BLADE, BAND SAW: 306-100 (18056).
 BLADE, BAND SAW: 306-126 (18056).
 BLADE, BAND SAW: 306-167 (18056).
 BLADE, BAND SAW: 306-183 (18056).
 BLADE, BAND SAW: 306-225 (18056).
 BLADE, BAND SAW: 306-408 (18056).
 BLADE, BAND SAW: 306-324 (18056).
 BLADE, BAND SAW: 306-365 (18056).
 BLADE, BAND SAW: 306-381 (18056).
 BLADE, BAND SAW: 306-407 (18056).
 BLADE, BAND SAW: 306-423 (18056).
 BLADE, BAND SAW: 306-480 (18056).
 BLADE, BAND SAW: 306-506 (18056).

BLADE, BAND SAW: 306-563 (18056).
 BLOCK, ANGLE: 27596 (18056).
 BLOCK, ANGLE: 27597 (18056).
 BRACKET, UTILITY SAW: 29584 (18056).
 BRACKET, UTILITY SAW: 29583 (18056).
 CABINET, STORAGE: 181 (18056).
 COLLAR, STOP: 11-28109 (18056).
 CLAMP, GUIDE: 31449 (18056).
 DISK CUTTER: 40044 (18056).
 FEED SCREW: 35-6212 (18056).
 FENCE, RIP: 35-5178 (18056).
 GAGE, INSERT: 34-08320 (18056).
 GAGE, INSERT: 13-08303 (18056).
 GAGE, INSERT: 13-08307 (18056).
 GRAPHITE, POWERED: 458-140613 (18056).
 GUIDE, BAND: 16686 (18056).
 GUIDE, BLOCK, SAW: 11507 (18056).
 GUIDE BLOCK, SAW: 11543 (18056).
 GUIDE BLOCK, SAW: 11519 (18056).
 GUIDE BLOCK, SAW: 11528 (18056).
 GUIDE, FILE: 27487 (18056).

GUIDE, FILE: 27488 (18056).
 GUIDE, FILE: 27489 (18056).
 HOLDER, POST: 7329 (18056).
 INSERT, SAW GUIDE: 4499 (18056).
 INSERT, SAW GUIDE: 4498 (18056).
 INSERT, SAW GUIDE: 4497 (18056).
 INSERT, SAW GUIDE: 4496 (18056).
 INSERT, SAW GUIDE: 4495 (18056).
 INSERT, SAW GUIDE: 3960 (18056).
 INSERT, SAW GUIDE: 3959 (18056).
 INSERT, SAW GUIDE: 3958 (18056).
 INSERT, SAW GUIDE: 3957 (18056).
 JAW, HOLDING: 5-13007 (18056).
 PENCIL ETCHING: 13-07004 (18056).
 PLATE, CENTER: 10627 (18056).
 PLATE, CENTER 29261 (18056).
 PLATE, CENTER: 10570 (18056).
 ROD, SLIDE: 101935 (18056).
 SCREW, BACKUP: 34-09001 (18056).
 SCREW, BACKUP: 35-1603 (18056).
 WRENCH, BOX: 34-20308W (18056).
 WRENCH, TABLE TRUNION: 10853 (18056).

Pages A-1 through A-7. Appendix A is superseded as follows:

APPENDIX A **BASIC ISSUE ITEMS LIST** **AND** **ITEMS TROOP INSTALLED OR AUTHORIZED LIST**

Section I. INTRODUCTION

1. Scope

This appendix lists basic issue items and items troop installed or authorized required by the crew/operator for operation of the Saw, Band Metal Cutting.

2. General

This basic issue items list and items troop installed or authorized list is divided into the following sections:

- a. *Basic Issue Items List.* Not applicable.
- b. *Items Troop Installed or Authorized List.* Not applicable.

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USAOC&S (1)
USAQMCENFL (3)
USASCS(1)
WSMR(1)
Ft Story (1)
USAAVNS (5)
USAARMS (5)
AD (3) except
 TEAD (16).
USDB (2)
LGH(1)
USABRL (1)
USA Aero Dep Maint (1)
4th USASA Fld Sta (I)
Ord FLDMS (2)
Ft Knox FLDMS (10)
Units org under fol TOE, 2 ea:
 11-15;
 11-17;
 11-38.

ARNG: State AG (3).

USAR: None.

For explanation of abbreviations used, see AR 310-50.

TECHNICAL Manual }
 NO. 9-3419-228-10 }

HEADQUARTERS
 DEPARTMENT OF THE ARMY
 Washington, D.C., 20 December 1966

Operator's Manual

SAW, BAND, METAL CUTTING, FLOOR MOUNTING,
 26 INCH THROAT DEPTH, 26 X 26 WORK TABLE, TILT TYPE
 TABLE, 220-VOLT, 60 CYCLE, 3 PHASE W/INTERGAL BUTT
 WELDER (DoALL COMPANY, MODEL 26I2-M) (3419-542-1328)

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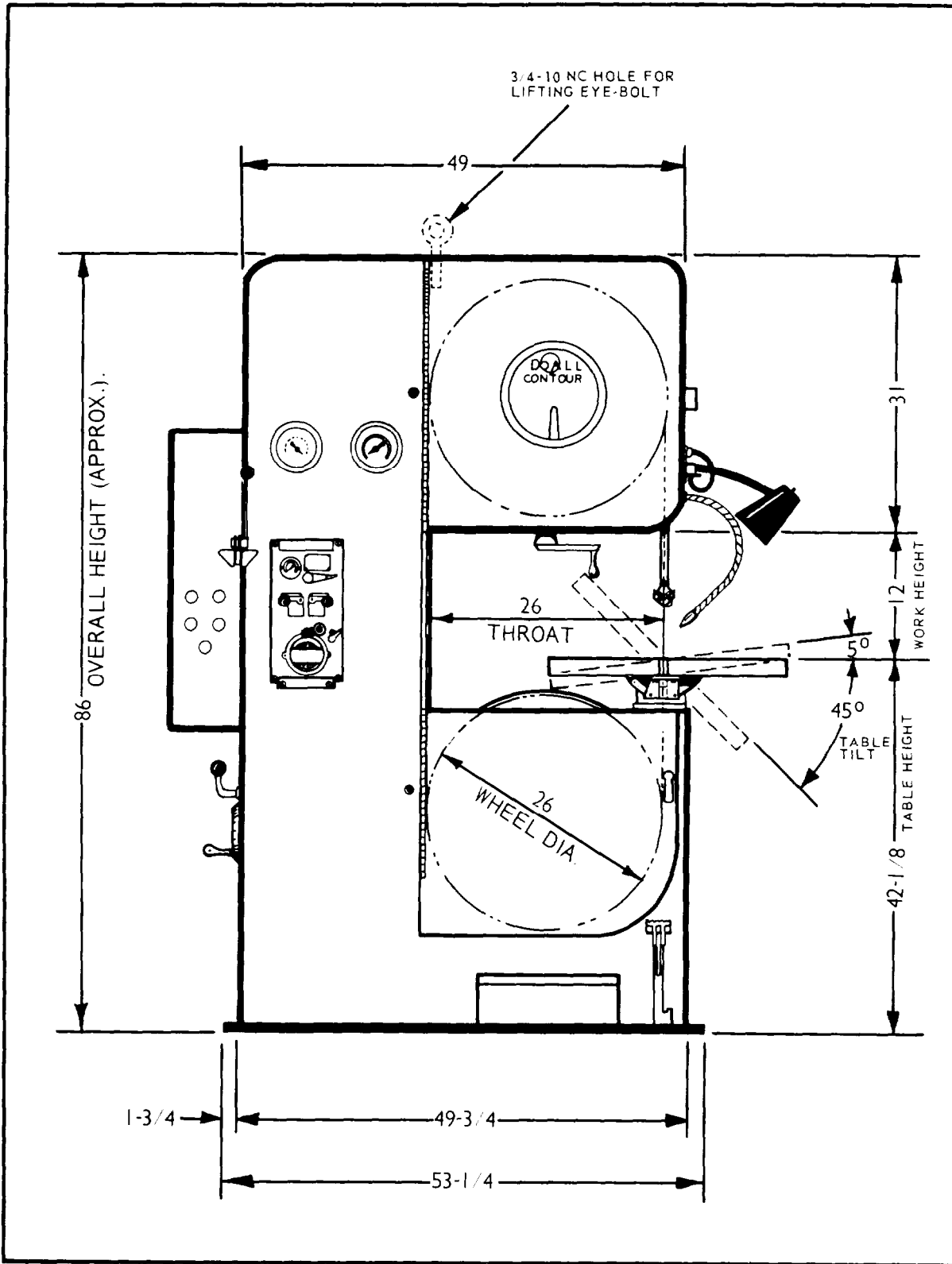


Fig. I - Model 2612-IM dimensions.

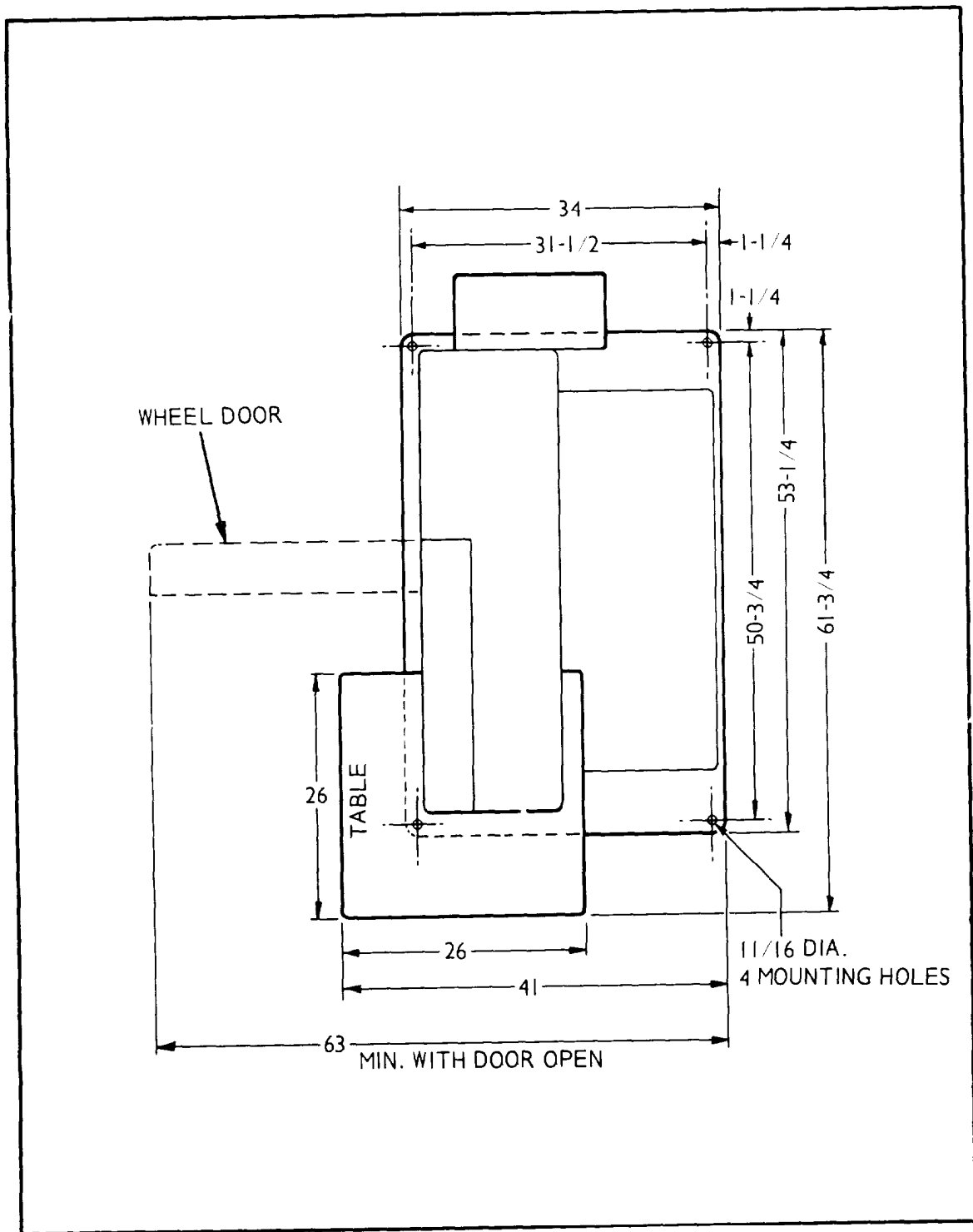


Fig. 1 - Plan view dimensions and mounting bolt locations.

CHAPTER 1

INSTALLATION

LOCATION

Place the machine so that any overhead light will strike the table over the operator's right shoulder when he is in position for cutting. The machine should be centrally located for your cutting needs. Provide sufficient clearance around the machine for handling large pieces of material.

LIFTING INSTRUCTIONS

A 3/4 in. NC tapped hole is provided in the upper surface of the machine head. Use a forged 3/4-10 NC eye-bolt screwed into this hole for lifting the machine. (see Fig. 1).

UNPACKING

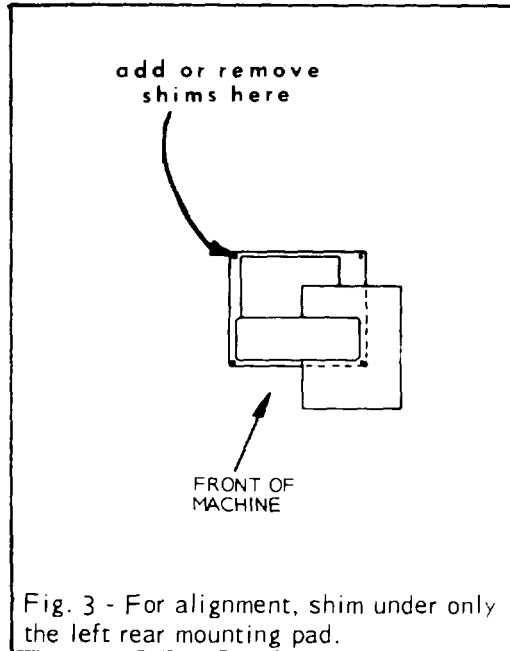
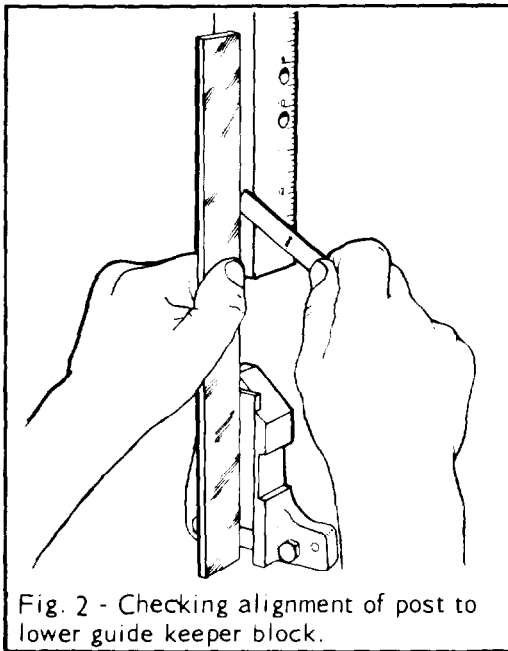
- (1) Remove rear drive housing. Carefully remove all protective coverings, strapping, and the skid. Unfasten the hold-down bracket for the power feed weight.
- (2) A rust-preventive coating has been applied to all exposed bare metal surfaces. Remove this coating with solvent. Inspect the machine for broken or damaged parts.

ELECTRICAL INSTALLATION

Bring the leads of the line circuit to the electrical enclosure on the machine column. Refer to the wiring diagram furnished with the machine.

Jog the start button intermittently and open the door over the lower band wheel. Check to see if the wheel is turning clockwise. If it is turning counterclockwise, reverse any two of the connections.

Overload protection is provided by a magnetic switch. Under ordinary conditions this will be ample protection. If the machine is started and stopped a number of times in rapid succession, the overload will kick out. Let the relay cool for a few minutes before starting the machine again.



ALIGNMENT

Before the machine is bolted into position, or whenever the machine is moved, the alignment should be checked and the machine shimmed.

- (1) Place machine in desired location. Use 1/4-in. spacers between the floor and the base mounting pads of the machine.
- (2) Shim under the pads as required until the machine is level and bears evenly on all pads. Uniformity of bearing can be checked by tapping on the spacers with a bar or hammer.
- (3) Install a 3/4-in. wide saw band and apply correct band tension. Remove table center plate and post saw guard.
- (4) Clamp or hold a straight edge (see drawing) to the front face of the post and the face of the lower saw guide keeper block.
- (5) The post should be parallel with the machined saw guide mounting recess in the lower keeper block. As shown in the drawing, this parallelism is checked by placing a spacer block (ground to exactly .250" thickness) in the keeper block. Then place an accurate straight edge against this spacer block and the post. Using a feeler gage, check the clearance and parallelism of the post to the straight edge. A clearance of .004" or less is required.
- (6) Adjust the gap by adding shims (to increase gap) or removing shims (to decrease gap) under only the mounting bolt location shown in the sketch.

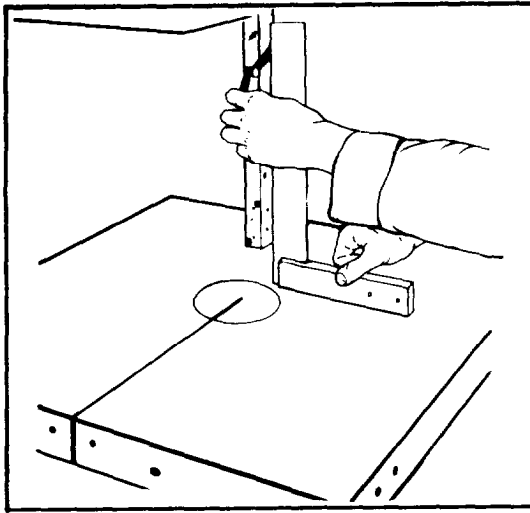


Figure 4

Loosen the table tilt lock nut, and square the table to the post as shown.

- (7) Replace table center plate and post saw guard.
- (8) Loosen table tilt trunnion lock nut with the wrench furnished with the machine. Square the table to the post and tighten the trunnion lock.
- (9) If necessary, adjust the tilt angle pointer to zero.
- (10) The center of the band should ride directly on the center crown of the wheel tire with the back edge of the saw band just touching the saw guide back-up bearings. Adjust upper wheel tilt if necessary so that the band will track properly, (see the tracking adjustment in the Operation Chapter).

PREPARATION FOR USE

- (1) Check the transmission oil level and fill if necessary. See Lubrication, Chapter 3.
- (2) Check to see if all other points listed in the Lubrication Chart, Chapter 3, have been serviced.
- (3) Read the entire manual before operating the machine.

CHAPTER 2

OPERATION

TO USE THE JOB SELECTOR, FOLLOW THESE STEPS:

- (1) Turn the dial until the material to be cut is directly below the window in the cover.
- (2) Locate the recommended pitch and blade type listed next to the work thickness.
- (3) If a radius is being cut, locate the correct blade width on the radius chart. Having determined the width, pitch and tooth type, refer to the saw blade specification table to determine the gage and set. If the desired pitch is not available in the width needed, a compromise must be made. In thick materials, if the desired pitch is coarser than that available, the nearest pitch should then be chosen for the width needed. In thin materials, if a finer pitch is indicated than that available, reduce the width until the optimum pitch is found.
- (4) Locate the recommended band speed for the work thickness and blade type used.
- (5) Note the recommended feed force to be used for the work thickness.
- (6) This completes the choice of blade and sets up requirements for the optimum sawing job. However, these recommendations can be adjusted to meet particular requirements of the sawing job.

ELECTRICAL CONTROLS

The following controls are provided on the electrical cabinet:

- (1) Band drive start pushbutton.
- (2) Band drive stop pushbutton.
- (3) Grinder start pushbutton.
- (4) Grinder stop pushbutton.
- (5) Emergency stop pushbutton.

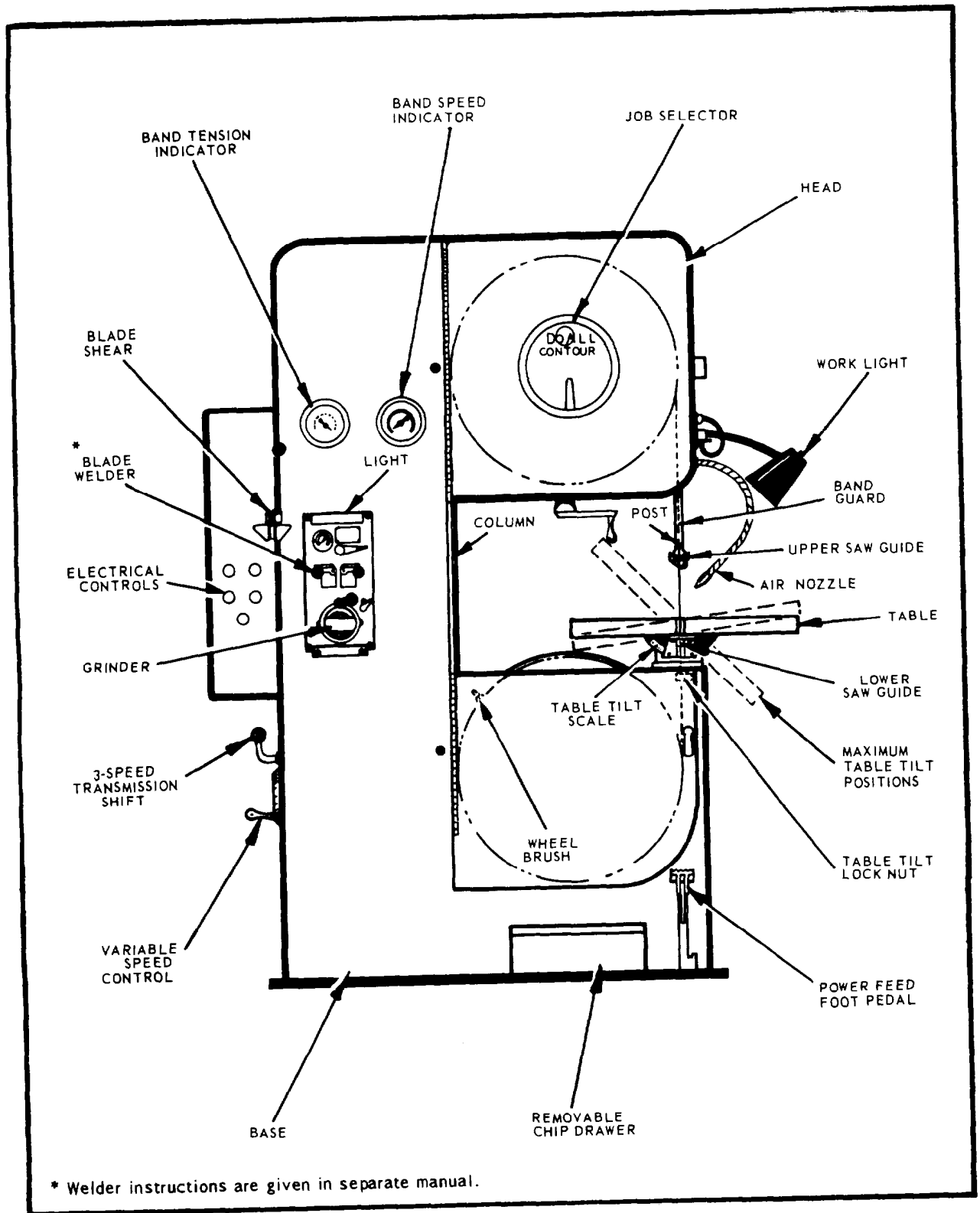


Fig. 5A - Features and controls, front view.

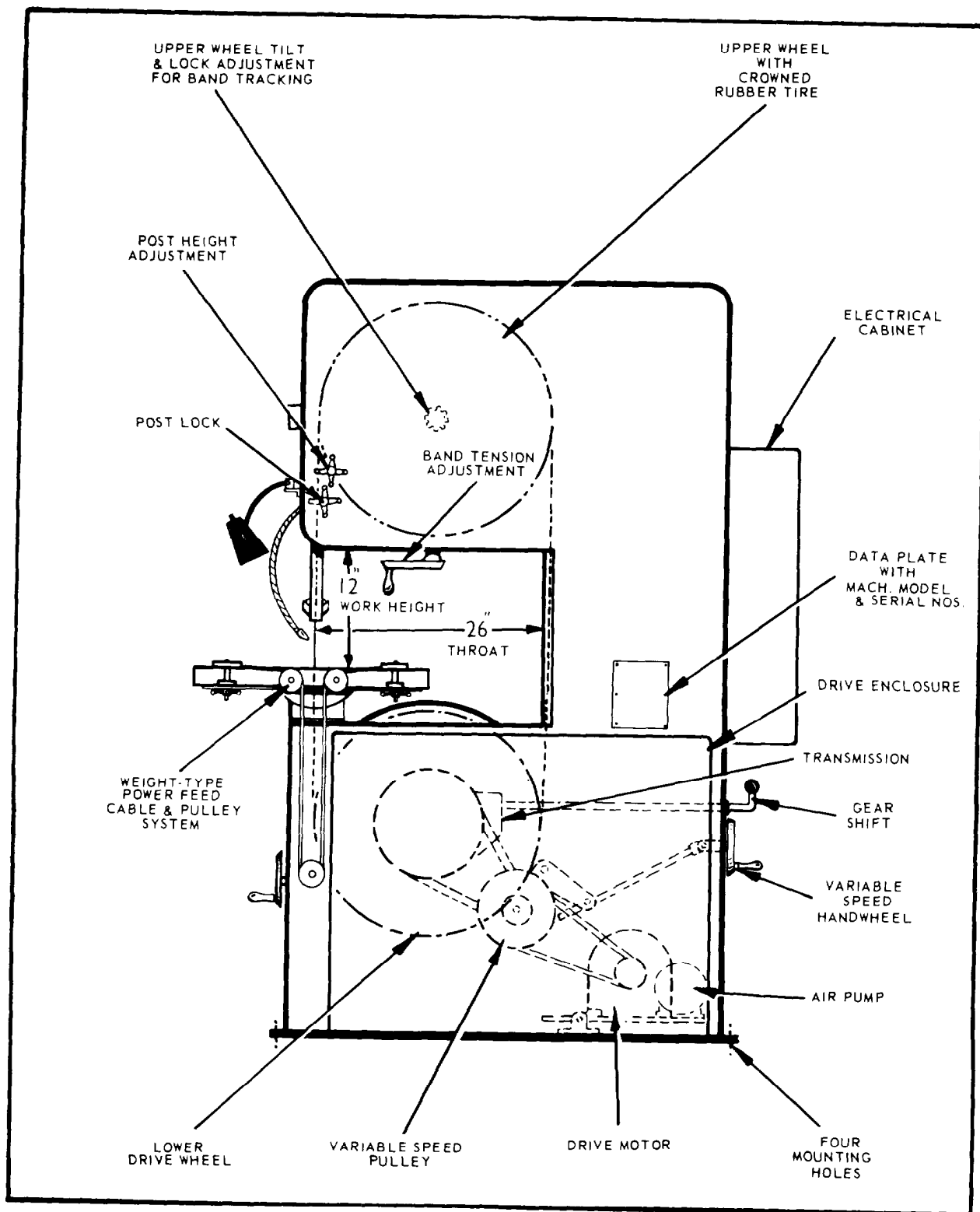


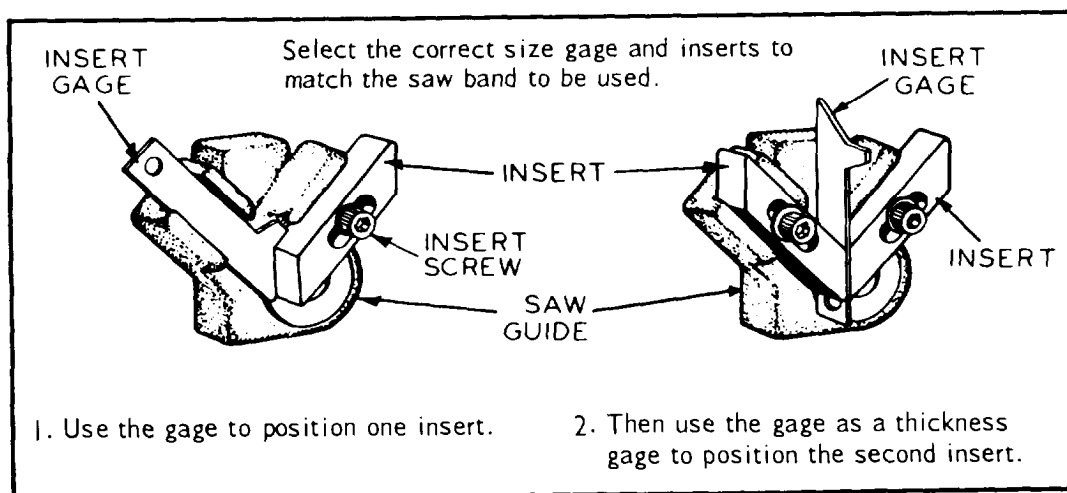
Fig. 5B - Features and controls, rear view.

INSTALLING SAW GUIDES

The standard saw guides furnished with the machine are installed directly on the post and keeper block when using 5/8 and 3/4 inch saw bands. For 3/8 and 1/2 inch bands, it is necessary to install special spacers (numbers 901289 and 901291, about .115 inch thick) between the upper guide and post and between the lower guide and keeper block. For bands 1/16 thru 1/4 inch, use spacers 901290 and 901292 which are about .240 inch thick. These spacers will position the guides correctly so that the bands will be centered approximately on the crown of the wheel tires.

HOW TO ADJUST INSERT-TYPE SAW GUIDES (see drawing)

- (1) Select the set of inserts marked for the width of saw band being used.
- (2) Place the right-hand insert in the milled slot, and tighten the screw lightly so that while the insert will slide in the slot, it will still hold its position when released.
- (3) Select the proper insert gage for the gage of saw band being used.
- (4) Place the gage in the opposite slot and adjust the insert so that it meets the two gaging edges. Then tighten the insert securely in place.
- (5) Place the left-hand insert in the slot and tighten the screw lightly.
- (6) Place the gage edgewise between the two inserts. Then bring the left-hand insert down so that it rests against the gage. When the gage is removed, the gap left will be the proper thickness for the saw band.



How to adjust saw guide inserts, upper guide shown.

BAND TENSION CHART

Type of Saw Band	BAND WIDTH IN INCHES								
	1/16	3/32	1/8	3/16	1/4	3/8	1/2	5/8	3/4
Dart				10	12	18	28	45	45
Standard Carbon	1.5	2.5	3.5	5.5	7	12	14	26	31
Spring Temper				7	10.5	15	22	36	45
Friction							19		35
Knife Edge					7		16		28
Scallop Edge				7	10.5	15	22	28	45
Woodworking				7	10.5	15	22	36	45
Polishing Bands	1.5								
File Bands	3.5								

BAND TENSIONING

It is essential that the saw band be correctly tensioned in order to obtain maximum accuracy and cutting rate.

Band tension is applied by turning the removable handcrank located below the saw head. Tighten the band to the proper tension indicated on the band tension scale mounted on the machine. The figures on this scale are recommended tensions and are based on the most common gages and pitches used. When using bands with coarser pitch or lighter gage, reduce tension. Increase the tension when using heavier bands.

A new band may stretch slightly as it is being used. It is important to check the tension of the band so that it does not become too slack.

The Band Tension Chart gives recommended tensions for all sizes of all band tools recommended for the machine.

BAND INSTALLATION

- (1) Open the band wheel doors.
- (2) Unlock and open the bar which crosses the saw slot, just below the front edge of the table.
- (3) Using gloves to handle the band, place it carefully over the wheels and between the saw guide inserts so that the band is centered on the crown face of the wheel tires.
- (4) Close and lock the bar over the table slot and close the wheel doors.

TRACKING THE BAND

To facilitate tracking the blade on the wheels, the upper wheel is tiltable in and out as well as adjustable up and down.

- (1) With the wheel doors open, jog the start button and observe how the band tracks, (see drawing below).
- (2) Adjust upper wheel tilt until the band tracks properly. The tilt and lock controls are located on the wheel hub. To adjust wheel tilt, first loosen the lock which is located between the tilt adjusting knob and the wheel. Then turn the tilt knob until the back edge of the band just touches the saw guide backup bearings. The band should ride near the center of the band, wheel tire.
- (3) When the band is tracking correctly, tighten the tilt lock.

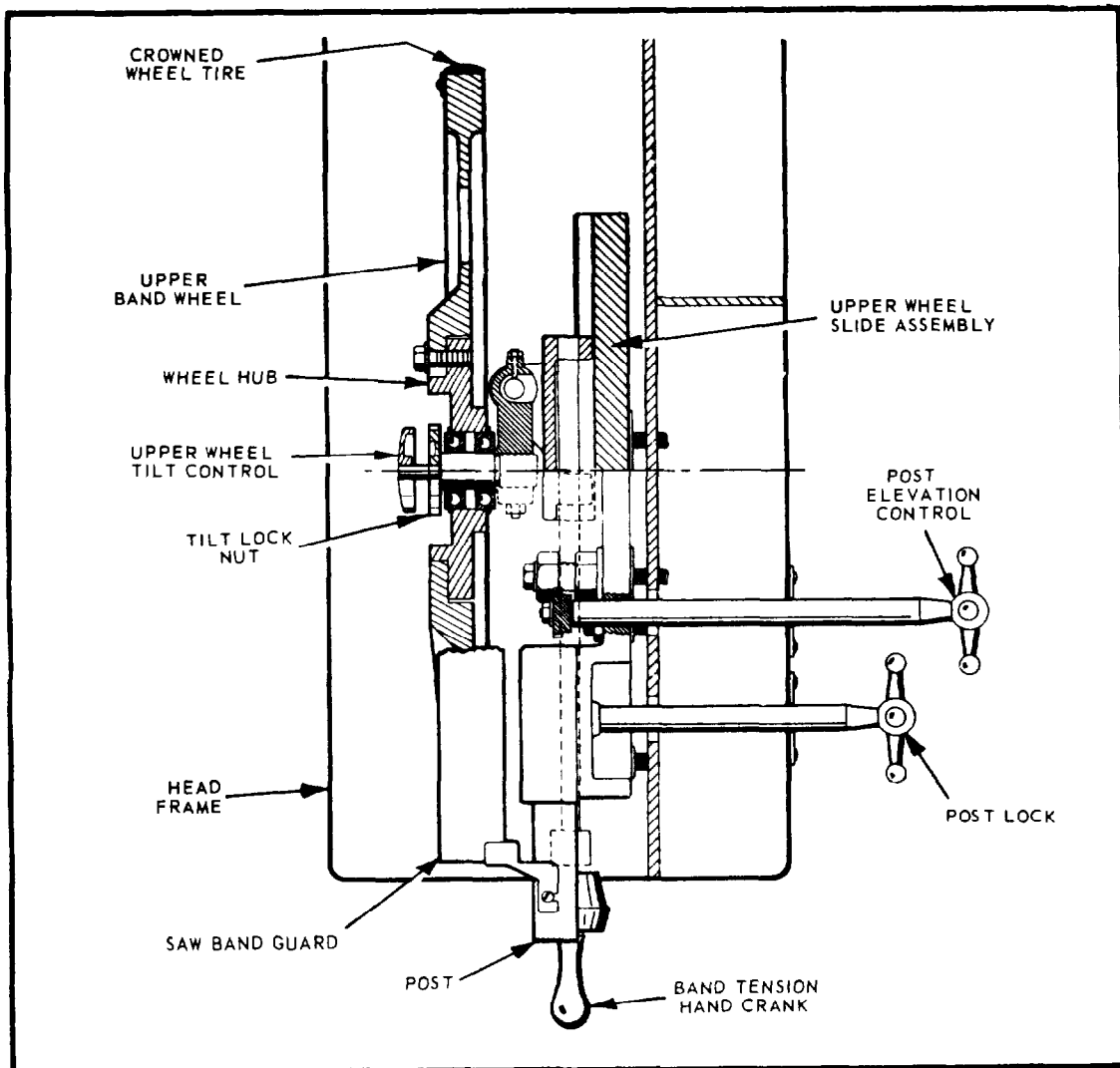


Fig. 6 - Section drawing of the head assembly.

ADJUSTING THE POST

The post is adjusted manually and locked in place with the hand controls located on the back of the head. Always keep the post and saw guide as close as possible to the workpiece. This will provide maximum support for the saw band and increase accuracy.

WORKHOLDING JAW

The workholding jaw is often used with the contour sawing accessory or, with handles attached, as a fixed-angle jaw for manually-guided contour sawing. A workholding jaw with adjustable-angle jaws is also available.

CHIP REMOVAL

A removable chip drawer is provided below the lower wheel.

Remove the drawer and clean out when necessary. A wheel brush, mounted above the lower wheel, cleans chips from the wheel tire.

WELDING SAW BANDS

Complete instructions covering blade welding and operation and maintenance of the Welder are given in the separate Welder Instruction Manual.

ADJUSTING TABLE TILT

Table tilt is used primarily when sawing compound angles. To tilt the table, loosen the lock nut with the wrench provided and tilt the table manually until it is at the desired angle. The amount of table tilt (maximum: 5 deg. left and 45 deg. right) is shown by the pointer and calibrated scale mounted on the trunnion. Next, lock the table in position.

WORKTABLE

The worktable is drilled and tapped on its side for the attachment of accessories. The table measures 26 by 26 inches and can be manually tilted up to 45 degrees to the right and up to 5 degrees to the left. The standard table center disk used for sawing must be removed and replaced with special-purpose center disks furnished with the band filing and polishing attachments.

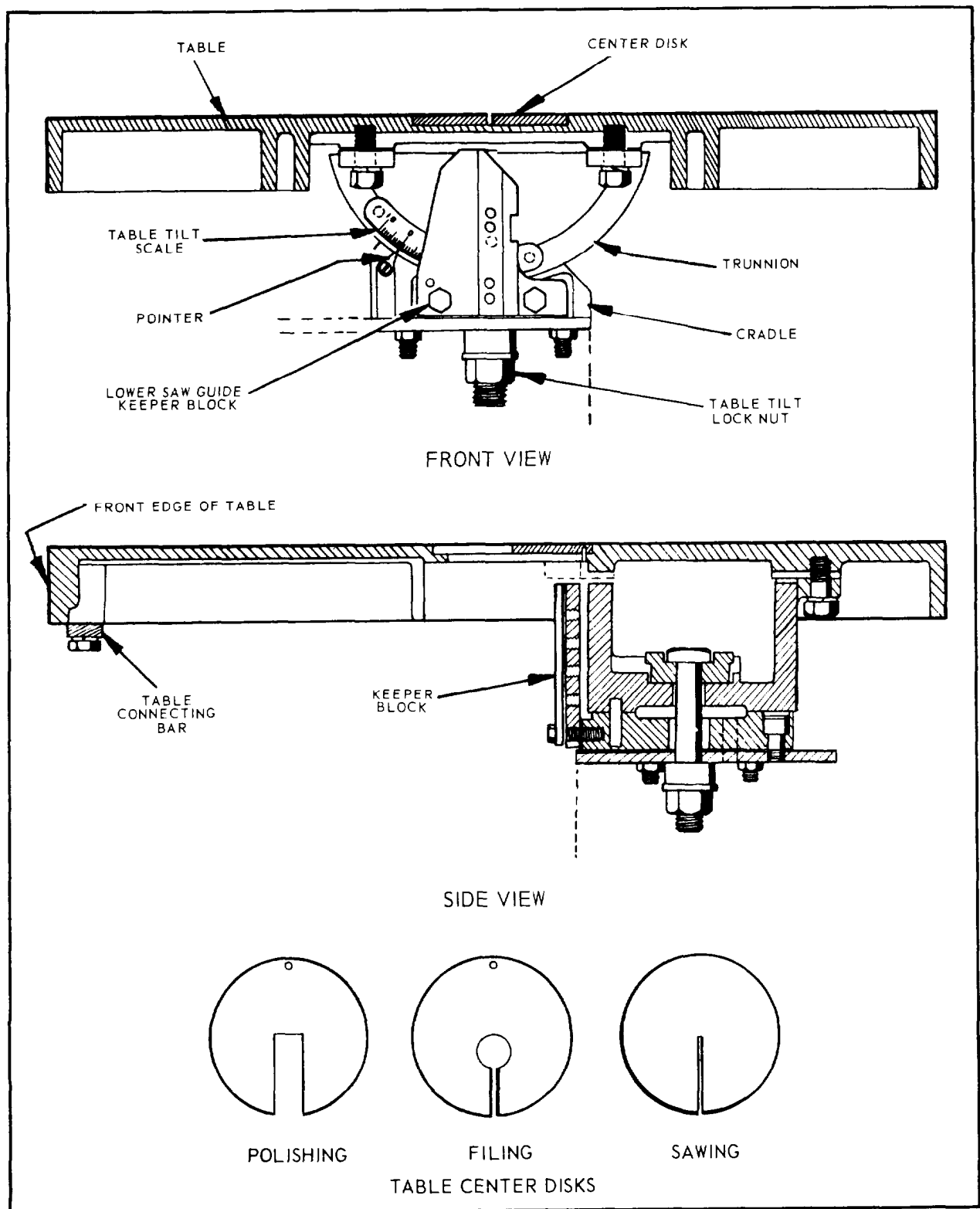


Fig. 7 - The worktable and center disks.

USING SPEED CONTROLS

Use the gear shift control to select any one of three transmission speed ranges. Each speed range can be infinitely varied by the speed change control which changes the position of the variable pulley. Band speed is shown in fpm for each speed range on the speed indicator dial. Good practice recommends the following precautions:

- (1) Shift gears only when machine is running at slowest speed. If gears do not immediately mesh, do not attempt to force shift control into place.
- (2) Before stopping machine, always turn variable speed control to "slow". This will reduce the load on the drive system when the machine is started.
- (3) An interlock mechanism prevents shifting gears when variable pulley is in its high speed position.

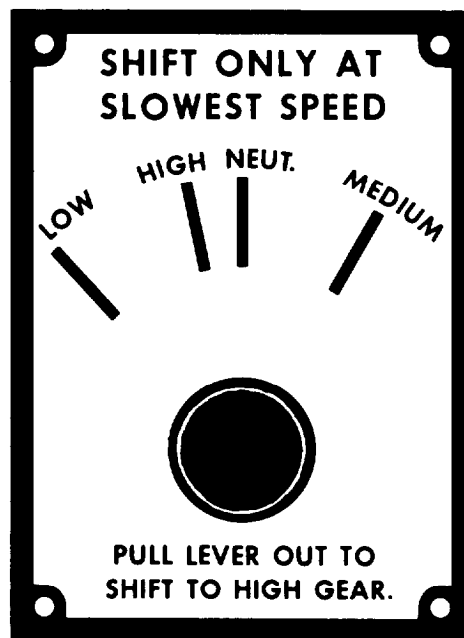


Fig. 8 - The transmission gear shift.

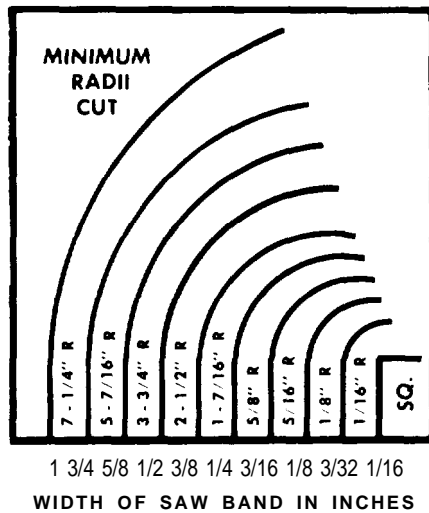


Figure 9

Radii Chart. The minimum cutting radius possible is shown above each saw band width. The recommendations in the radii chart are based on sawing relatively thin stock. Use a narrower saw band than recommended when sawing stock more than one inch thick.

CONTOUR SAWING PROCEDURES

- (1) Use hand feed for sawing intricate contours.
- (2) The weight-type power feed should be used for contour sawing of large, heavy parts.
- (3) When cutting into an opening, reduce feed force to prevent damage which might result when blade enters opening suddenly.
- (4) Do not feed work so rapidly that saw band twists or bows. Follow recommendations on Job Selector for band speed and feed pressure.
- (5) A hole is usually drilled when there is a sharp corner to be cut, but this is not always true. A corner may be by-passed with a curve and the remainder notched out later.
- (6) To saw an internal contour, first drill a starting hole, then run saw band through hole and weld. If the contour is a radius, use the Disk Cutting Accessory. The diameter of the drilled starting hole is determined by the width of the saw band.
- (7) The widest possible saw band is used for the curve to be cut, but attempting to cut too small a radius with too wide a saw band may bind the band. See the radii chart for minimum radii possible with various saw band widths.
- (8) Use a heavy gage blade for contour sawing of heavy workpieces.

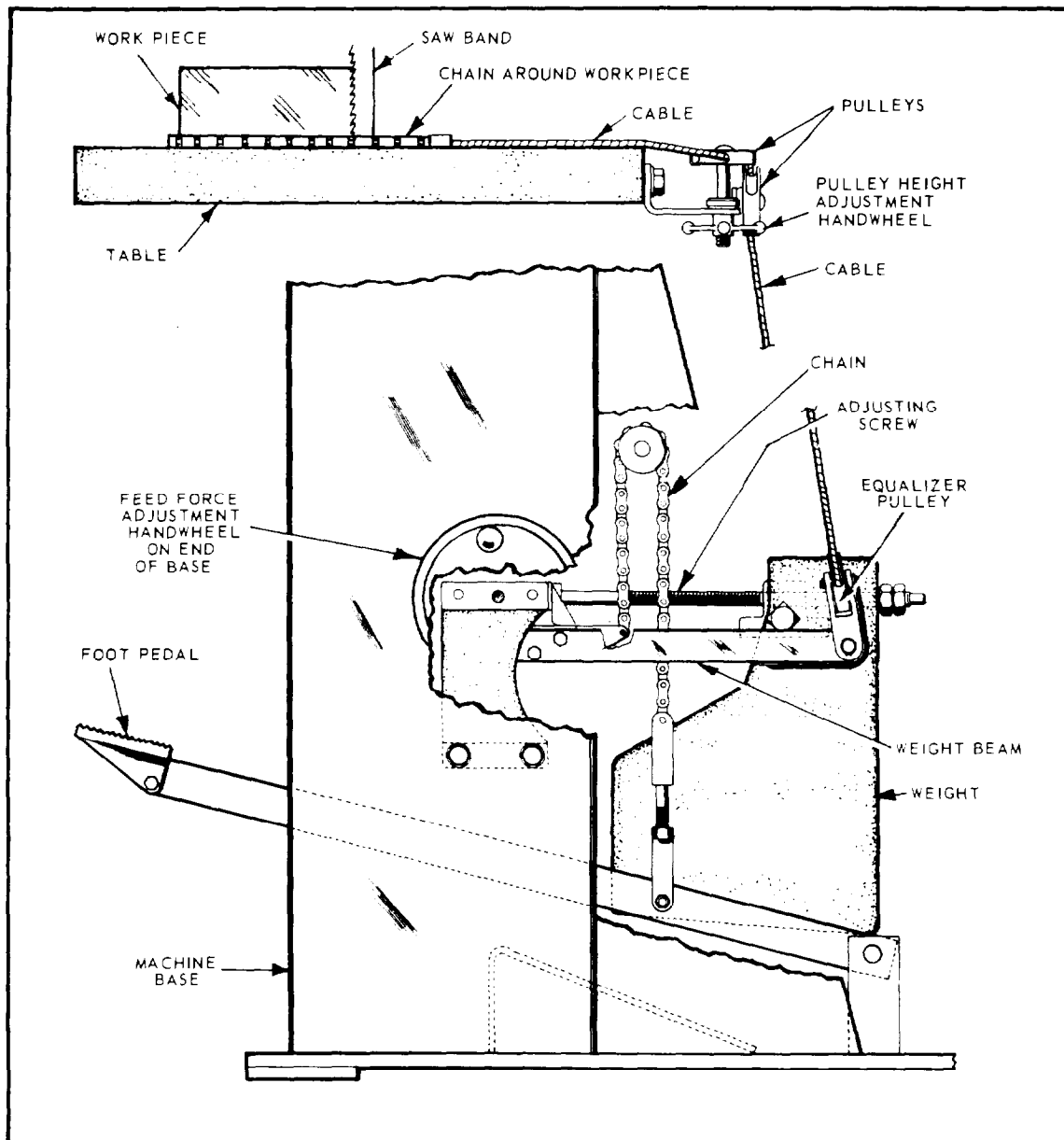


Fig. 10 - Side view of the Weight-type Power Feed assembly.

USING THE WEIGHT-TYPE POWER FEED

- (1) The weight-type power feed is a feed assist which allows the operator to use both hands to guide the work while it is being pulled into the saw band.
- (2) The mechanism for this system is contained within the machine. A weight on a beam pulls the work holding chain which, in turn, pulls the work into the blade. The chain and cable pulley system permits rotating the work to follow curved layout lines while still using power feed.

- (3) Position of weight on beam determines both rate and force of feed. This position is set by a hand wheel on side of machine. The beam is raised initially by a pedal on front of machine.
- (4) The weight-type feed system exerts 0 to 80 lbs maximum feed force against blade. Heavy feed force should be used when sawing with wide saw bands. Lighter feed forces are required when using narrower bands.
- (5) Feed force less than 10 lbs. is achieved by partially restraining pedal. Lighter feed forces are also required if workpiece is significantly thicker. Example: 1/4 in. band in 1 in. t-hick 1020 HRS use maximum feed force; but in 6 in. thick 1020 HRS use light feed force.
- (6) On large work where cut is longer than 10-in. maximum feed distance, the weight is brought back into position by pressing pedal into notch at bottom of its stroke and then taking up slack in work-holding chain.

WARNING

When not in use, the pedal should be left in the upper position. This guards against injury to the operator and machine if the pedal should accidentally become dislodged.

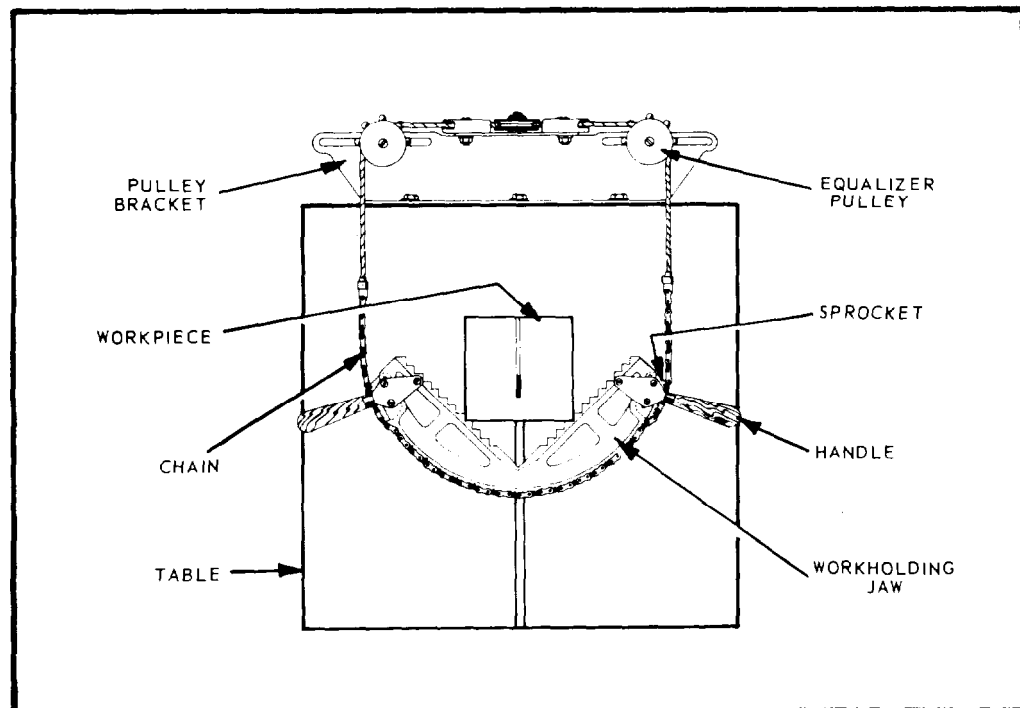


Fig. 11 - The power feed chain can be looped around the workholding jaw as shown here.

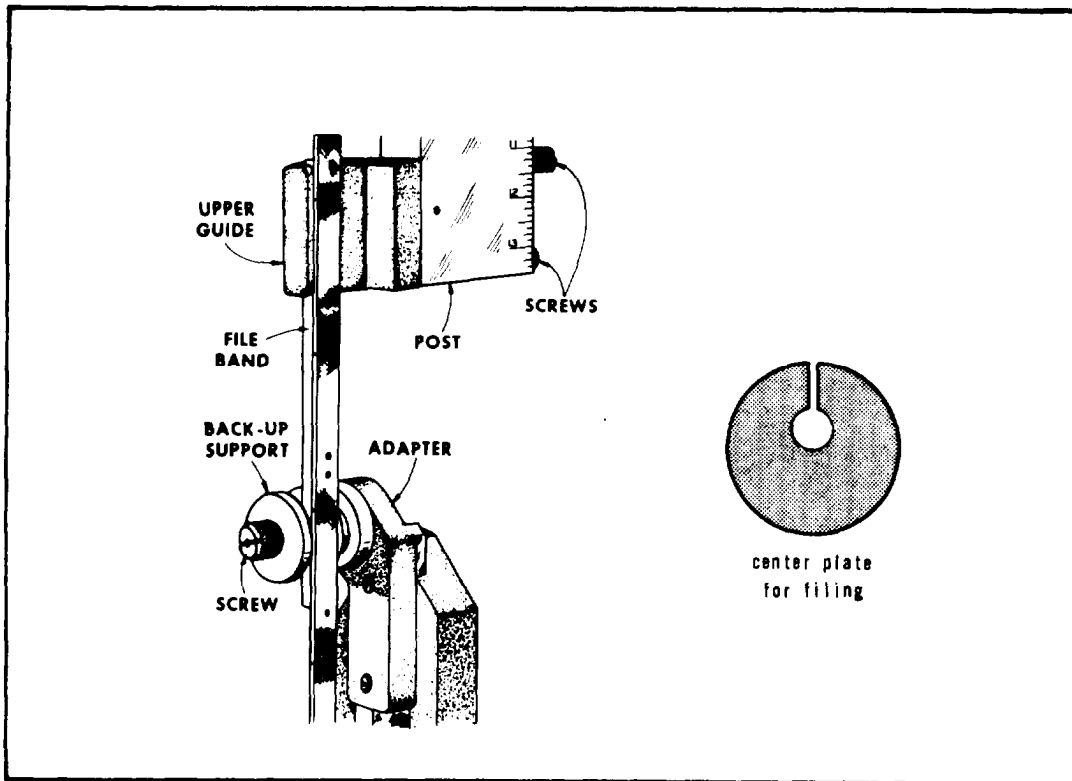


Fig. 12 - For band filing, install the file guides and center plate.

BAND FILING

A. Setting Up The Machine For Filing

For both internal and external filing, perform the following steps:

- (1) If the machine is set up for sawing, remove the saw band.
- (2) Remove the table center disk and post saw band guard.
- (3) Remove the saw guides from the machine.
- (4) Mount the file guide support on the lower keeper block, making sure the proper width of slot for the file band is being used.
- (5) Lower the upper post to the proper work thickness. This thickness should not exceed 2 in. for 1/4 in. file band and 4 in. for 3/8 and 1/2 in. bands.
- (6) Install the upper file guide, locking it firmly to the post with the knurled thumb screws.
- (7) Install the special table center disk for filing.

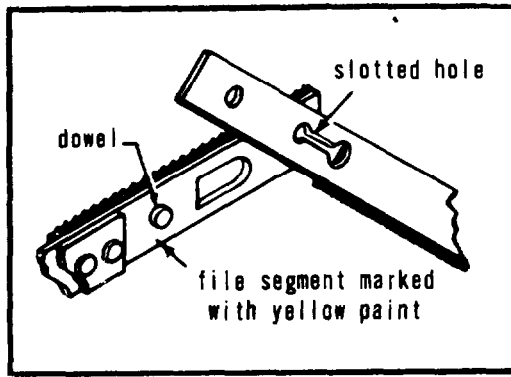


Fig. 13 - Joining the file band.

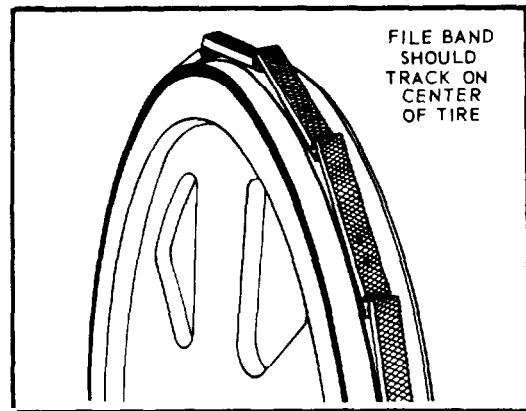


Fig. 14 - Tracking the file band.

B. Joining The File Band

- (1) With one end of the file band in each hand, (the yellow painted end in the left hand) hold the file ends at right angles with the filing surface up.
- (2) Depress the tip of the spring steel band held in the right hand with the lock rivet of the yellow segment held in the left hand.
- (3) Allow the rivet head to slip into the slotted hole. Slide the rivet head into the small end of the slot.
- (4) Straighten the file band, allowing the spring steel end to snap over the dowel.
- (5) Make sure the ends of the band are flush before running.

C. Tracking and Tensioning The File Band

The file bands are aligned on the wheels in the same manner as used in tracking the saw bands. The band can be made to run on the crown of the wheel by tilting the upper wheel with the tilt control. The file band should run freely in the file guide channel when properly tracked.

Adjust the tension of the file band to the same tension as that used for a 1/8 in. wide carbon saw band. Too much tension will cause the file segment rivets to break when heavy filing pressure is applied. While at first it might seem that with excess tightening of the file band better filing results are obtained, this is not the case. Most accurate filing can be obtained with the light band tension.

Check the file band to see that it is in alignment and will pass freely over the channel in the file guide. Then shift the machine into low gear and start the drive motor. Observe how the file band tracks.

D. Filing Operation

The correct combination of speed and pressure will produce curled chips. The best filing speeds are between 80 and 150 fpm.

Turn the Job Selector Dial to the section on "Band Filing". Correct file band velocity and feed pressure for the work thickness are listed for many different metals. For internal filing, unlock the bar d and run it through the opening in the workpiece, then assemble.

Keep the files clean. Do not file when the teeth are loaded. Loaded files cause bumpy filing and scratch the work. Excessive filing pressures when the file segments are clogged with chips will cause the file teeth to strip out. Use a file card to clean the band before returning any file band to the storage cabinet.

A coolant such as Kleen Kool by DoALL can be used to cool the work and keep the file clean. Mix the coolant per container instructions and apply in the form of a light mist. If any difficulty is encountered in seeing layout lines, band filing can be performed dry.

E. Removing the File Band

To remove the file band, release the tension by lowering the upper wheel, and slip the band off the wheels. To separate the band after it has been removed from the wheels, proceed as follows:

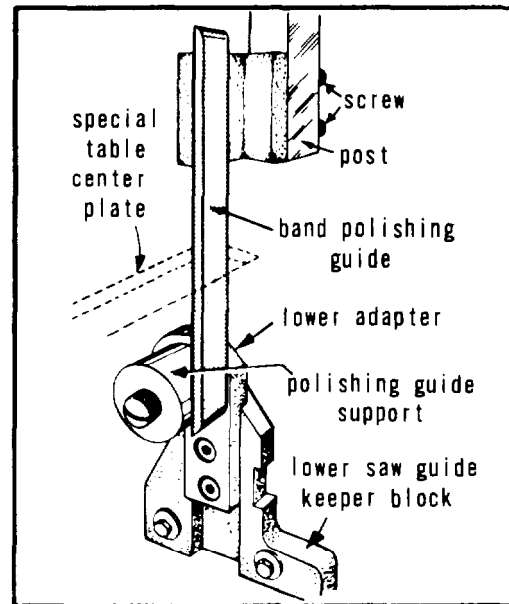
- (1) Hold band at joint with both hands, the yellow segment being held with the left hand.
- (2) Bend the joint to not more than a 12-inch radius, exposing the joint slot.
- (3) Using the forefinger of the left hand depress the front end of the yellow file band. With the thumb and forefinger of the right hand disengage the dowel.
- (4) Slide the lock rivet to the open end of the slot and lift off.

F. File Band Storage

The file band should not be coiled into more than three loops. By far the best means of storing file bands is in the DoALL Supply Cabinet described in Chapter 6. Here the bands are looped over in a 16-in. radius and the ends hang in a compartment.

Figure 15.

Set up the special band polishing guides as shown.



BAND POLISHING

DoALL abrasive bands are manufactured to withstand high finishing and polishing temperatures. Abrasive bands are 1 in. wide. These bands are mounted over the wheels in the same manner as saw bands; however, a rigid backup support is used which has a graphite impregnated facing. This backup support is mounted to the post in place of the saw guides.

A. Set Up for Band Polishing as Follows:

- (1) Remove the table center disk.
- (2) Mount the polishing band guide back-up support to the lower adaptor as for filing.
- (3) Lower the post to 4 in. from the table and mount the band-polishing guide on the post with the two thumb screws.
- (4) Occasionally graphite powder should be rubbed into the guide fabric to lubricate and increase the life of the polishing bands.
- (5) Mount and track the polishing band on the wheels in the same manner as the file bands. The correct polishing band tension is the same as that used for a 1/16 in. wide carbon saw band.
- (6) Install the special center adapter plate in the table.
- (7) Do not use coolant with the polishing band.

Polishing bands are available in aluminum oxide or silicon carbide, and in three grain sizes. Use No. 50 (coarse) for heavy stock removal and soft materials, No. 80 (medium) for general surface finishing, and No. 150 (fine) for high polish and light stock removal.

BAND SPEEDS FOR POLISHING

Application	Cutting Speeds	Grit
Grinding	50-300 fpm	50
Polishing -coarse	850-1000 fpm	80
Polishing -fine	850-1500 fpm	150

SAFETY PRECAUTIONS

- (1) Always close band wheel doors before tensioning band or starting the band in motion.
- (2) Make sure that saw band guard on post is locked in place.
- (3) Wear safety glasses when operating the machine.
- (4) Step to one side and away from the welding unit before welding a saw band.
- (5) If a small work piece is to be sawed, use a pushing stick if at all possible.
- (6) Keep the drive system enclosure in place at all times except when servicing the machine.
- (7) Disconnect the power supply before removing the panels covering electrical components.
- (8) Always wear gloves when handling saw bands.

CHAPTER 3

LUBRICATION

LUBRICATION CHART

INDEX NO.	INTERVAL *	LOCATION AND HOW SERVICED	LUBRICANT
1	weekly	Variable speed pulley - oil cup in end of shaft.	SAE #10 oil
2	monthly	Speed change bracket screw and linkage.	SAE #20 oil
3	check monthly	Transmission . Fill transmission through pipe until oil level is at level of filler plug in elbow.	SAE #20 oil
4	monthly	Table trunnion slide - oil lightly.	SAE #20 oil
5	monthly	Contour feed assembly - oil rollers, gears, screw and chain.	SAE #20 oil
6	monthly	Post - wipe oil on post and work into block.	SAE #20 oil
7	monthly	Miscellaneous - door hinges, etc.	SAE #20 oil
8	monthly	Band tension thrust bearing - grease fitting.	# 2 high pressure gun grease
9	monthly	Upper wheel slide - 2 grease fittings.	
10		Drive motor - follow manufacturer's instructions.	
11		Air pump - Do not oil the air pump. Apply powdered graphite through air inlet, very sparingly. Remove air cleaner and wash in gasoline or solvent monthly.	

* (NOTE: LUBRICATION INTERVALS ARE BASED ON A NORMAL 8 HOUR DAY, SERVICE MORE OFTEN IF MACHINE IS OPERATED MORE THAN 8 HRS. PER DAY).

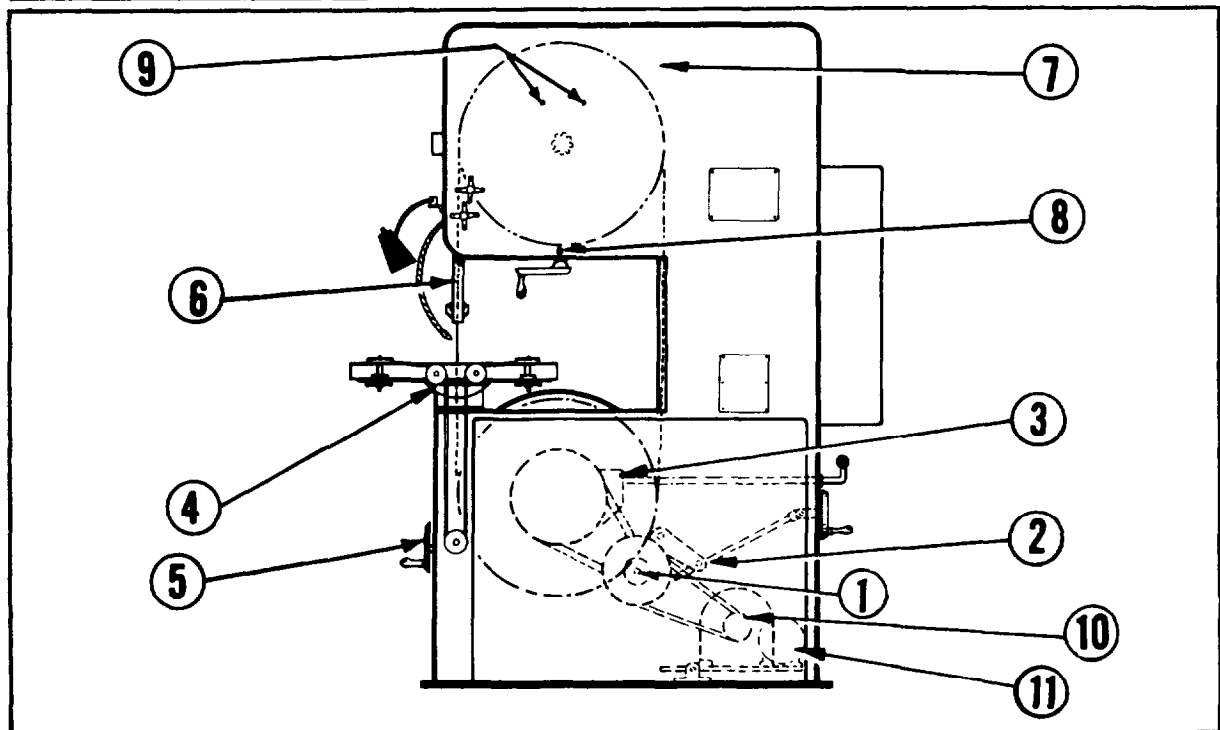


Fig. 16 - Lubrication diagram - rear view shown.

CHAPTER 4

MAINTENANCE

WHEEL BRUSHES

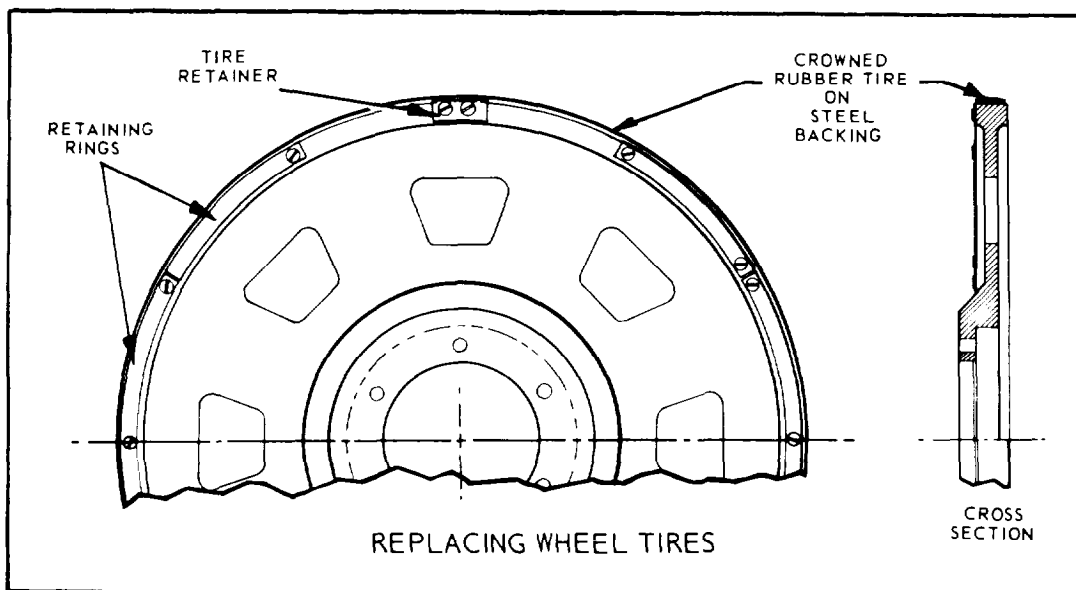
Check the wheel brush occasionally. If it is worn so that it is no longer contacting the wheel face, loosen the adjusting screws and move the brush up to the wheel. Replace as required.

ELECTRIC MOTOR

Main Drive Motor - Follow the manufacturer's instructions (see tag attached to motor).

REPLACING WHEEL TIRES (See drawing below)

- (1) Remove two retainers from front of band wheel.
- (2) Remove tire retaining rings.
- (3) Then drive tire off wheel (if necessary, saw off steel backing).
- (4) Mount new tires with two notches in steel backing in alignment with two tire retainers.
- (5) Put tire on with light taps of a soft-faced hammer, rotating wheel about 30 deg. as each tap is made until tire is against flange of the wheel.
- (6) Replace retainers and tire retaining rings.



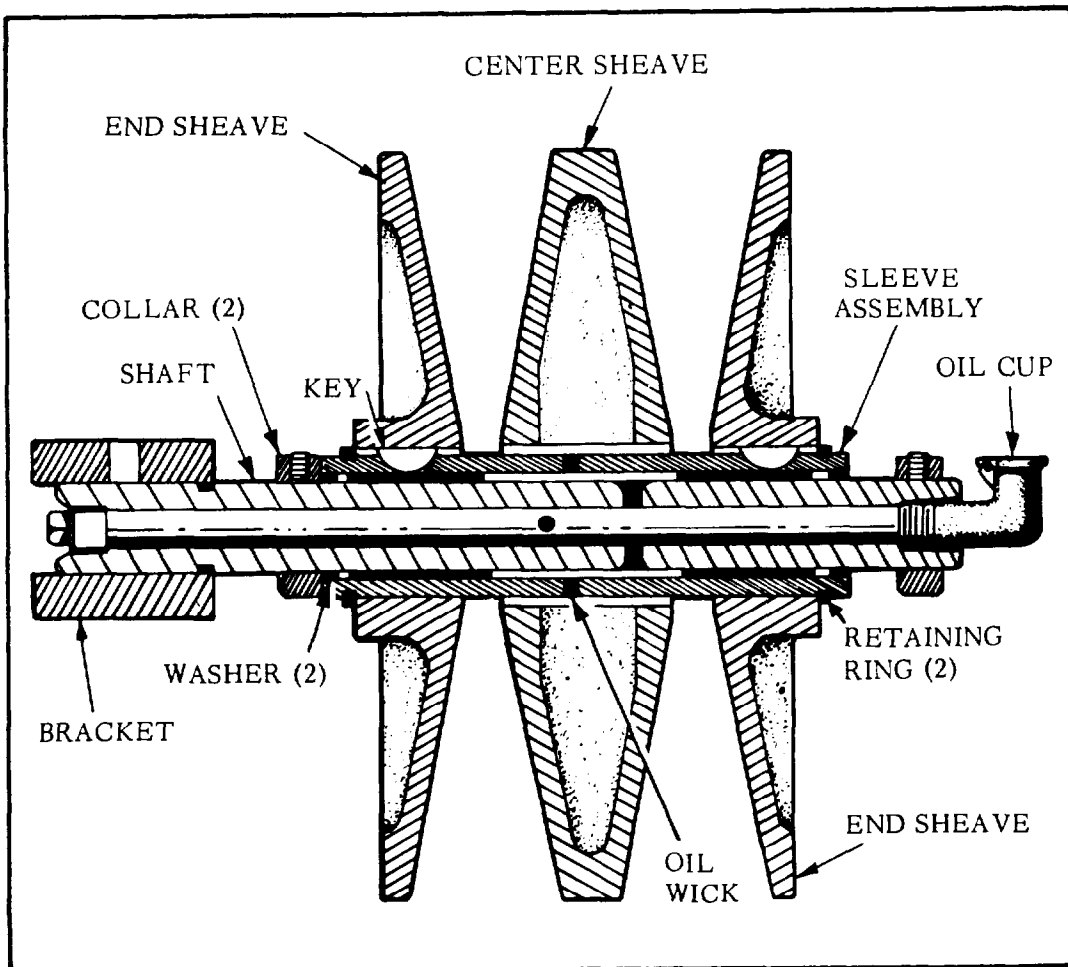


Fig. 17 - Cross section through the variable pulley.

VARIABLE SPEED PULLEY

Every six months remove the pulley unit, and wash and clean with solvent. Recoil and install. Check to see if center sheave of pulley is free to shift sideways. The variable shaft bearings are lubricated from an oil cup in the shaft end.

The center sheave, which floats sideways as well as rotates, is lubricated by a wick which is immersed in oil. This oil travels through the hollow shaft from the oil cup located at one end. **CAUTION:** Do not over lubricate, oil will coat the belts and cause slippage. Check the variable pulley faces for scoring which could damage the belts.

SAW GUIDES

The saw guide bearings are replaced by removing the snap ring and pulling out the bearing cap and shaft. The bearings are installed with a light press fit and can be easily replaced. The bearings are sealed and packed for life with a special lubricant.

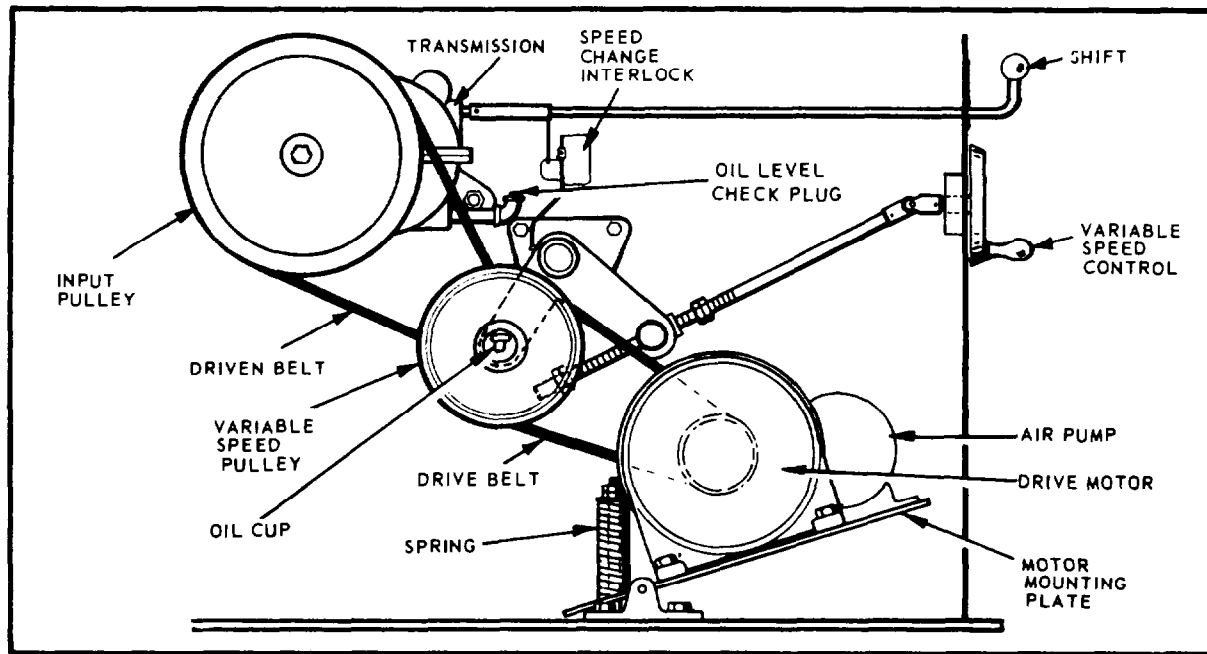


Fig. 18 - The band drive system.

DRIVE BELTS

The belts driving the variable pulley and input sheave will stretch slightly after initial use. The stretch of the belts is automatically taken up by the counter-balancing weight of the drive motor on its mounting plate.

The motor is mounted on a pivoted plate. The large spring to the left of the pivot is adjusted to counter-balance the weight of the motor on the drive belts.

To adjust belts:

Adjust nuts on counterbalance spring so that there is enough tension on drive belts to prevent slippage. If motor is insufficiently counter-balanced, unnecessary wear on variable pulley sheaves, bearings, and shaft will result. Too much counterbalance will cause motor to "climb the belt" or "hop" excessively.

To change belts:

- (1) Loosen air pump mounting bolts enough to move pump and remove belt.
- (2) Tilt pivoted motor plate and place a block under it.
- (3) The two drive belts can then be removed and replaced with new belts. Be sure to use DoALL belts.

HEAD ASSEMBLY

The wheel bearings are sealed and lubricated for life at assembly.

If it is necessary to adjust the band tension indicator, first loosen the set screw clamping the wire leading to the indicator. Then take all slack out of the band with the band tension control. Adjust the indicator pointer to zero and lock the linkage arm to the wire. A more accurate calibration can be obtained by using a DoALL band tension measuring instrument ("Tensigage").

TRANSMISSION

Drain, flush and refill after first month and thereafter at least every six months. Fill to top of fill pipe, but do not over-fill. Use SAE No. 20 oil. Check for seal leaks around shafts.

Any rough operation, vibration, loud or unusual noises should be investigated immediately. It is recommended that the transmission be returned to the factory for repairs. Installing a new transmission correctly is extremely important because of the careful alignment involved; consequently, it is recommended that this be done by a DoALL serviceman. If the shifter plate has been removed for any reason, do not attempt to operate the shift lever.

CHAPTER 5

TROUBLE SHOOTING

MACHINE WILL NOT START:

- (1) Check main fuses and control circuit fuse.
- (2) Check reset on band drive motor starter. Starting and stopping the machine a number of times in quick succession or an overload will trip the starter heater. After locating and correcting the trouble, push in the reset button.

MACHINE VIBRATION

- (1) Band wheels have become unbalanced.
- (2) Variable drive belts have been replaced by belts which are unbalanced.

SAW BAND VIBRATION (while sawing)

- (1) Incorrect band speed or feed force.
- (2) Incorrect choice of saw band pitch.
- (3) Work piece not firmly clamped to table.
- (4) Worn or improperly adjusted saw guide inserts.
- (5) Worn saw guide backup bearing.

SAW BAND CUTTING INACCURATELY:

- (1) Worn blade teeth.
- (2) Scale on workpiece not removed.
- (3) Blade too wide for radius being cut.
- (4) Incorrect saw band or insert alignment.
- (5) Incorrect feed force or band speed.
- (6) Coolant is not applied evenly to both sides of saw band.
- (7) Saw guide on upper post not located close enough to workpiece.
- (8) Incorrect saw band tension.

EXCESSIVE INSERT AND BLADE WEAR:

- (1) Inserts adjusted too tightly on blade.
- (2) Chip brush worn or not adjusted properly, allowing chips to stay on wheel.

FILE BAND BREAKS:

- (1) Feed force too high.
- (2) Wrong type file band being used.

POOR FINISH FROM BAND FILING:

- (1) Feed force too high.
- (2) File band not assembled correctly.
- (3) Band tension too high, set for same tension as used on 1/8 in. wide carbon band.

SURFACE FINISH ON WORK TOO ROUGH:

- (1) Saw guide insert worn. Re-adjust.
- (2) Saw band speed too low.
- (3) Saw band pitch too coarse.
- (4) Feed too heavy.
- (5) Vibration.

PREMATURE DULLING OF SAW BAND TEETH:

- (1) Not breaking in saw band on first few cuts. Reduce feed pressure and speed on first cuts.
- (2) Band speed too high, causing abrasion. Reduce speed.
- (3) Saw band pitch too coarse.
- (4) Feed pressure too light. Increase feed.
- (5) Coolant not covering saw band.
- (6) Cutting rate too high.
- (7) Faulty material such as heavy scale, inclusions, hard spots, etc.
- (8) Saw band vibration.
- (9) Chipped tooth lodged in cut.
- (10) Chip Welding.
- (11) Operator's error.
- (12) Inserts too wide for blade width, allowing inserts to hit set teeth.

BAND SLIPS OFF WHEELS:

- (1) Upper wheel not aligned correctly, band should track on center of wheel tire.
- (2) Initial machine alignment wrong, see Chapter 1.

CHAPTER 6

ACCESSORIES

DISK CUTTING ACCESSORY

The disk cutting accessory is used for cutting of true circles, either internally or externally, of any diameter from 2-1/2 in. to 30 inches. This attachment is bolted to the post with the cap screws and washers furnished.

- (1) Place flat washers under screws and bolt bracket (see drawing) to post.
- (2) Lower post until saw guides are approximately 3/8 in. above table.
- (3) Loosen bolts on fine adjustment and arm clamps and move center pin to approximate distance or radius to be cut. Tighten bolt on fine adjustment clamp.
- (4) The center of centering pin must be directly in line with cutting edge of saw band. To accomplish this, place a square against side of saw slot with blade of square against tip of saw tooth. Loosen vertical adjustment clamp bolt and line up centering pin with edge of square's blade; then clamp tight.
- (5) Make final radius adjustments with fine adjustment wheel and tighten arm clamp bolt. Tighten bolt on the radius arm clamp making sure center pin is square to table.
- (6) Adjust unit for work thickness by raising or lowering saw guide post.

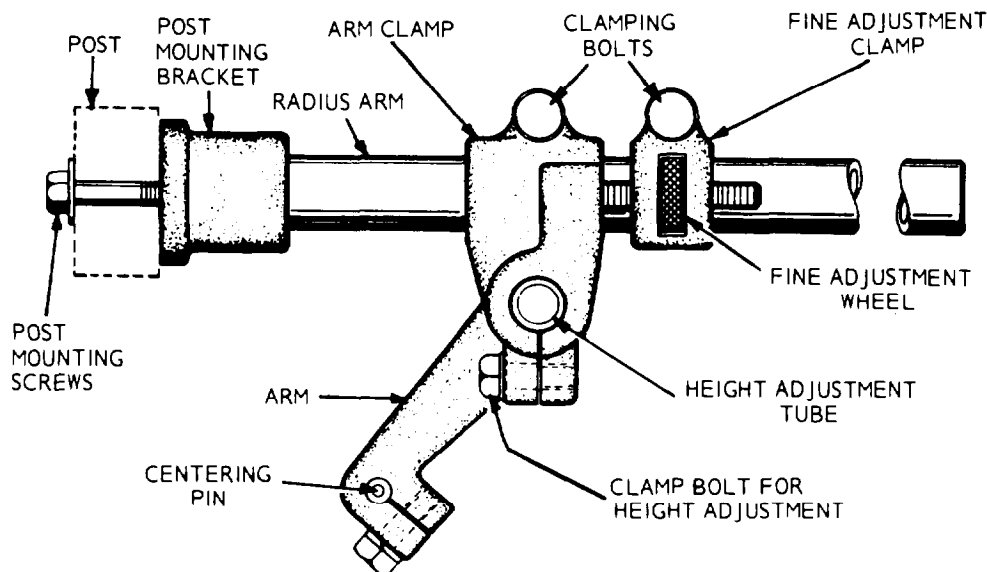


Fig. 19 - Top view of the Disk Cutting Accessory.

SUPPLY CABINET

The supply cabinet provides for orderly, safe storage of saw band coils, welded saw bands, file bands, and polishing bands as well as the component parts and accessories when they are not being used on the machine.

NO. 2 "SIDE-MOUNTING" MITERING ACCESSORY

Set up this attachment as shown in the drawing, making sure that the mitering bar is in even contact with the table surface. Use a combination square in the table slot as a basis for alignment and setting the mitering bar at various angles.

When not in use, swing the attachment up, to the right and around on the slide rod so that it hangs below the table.

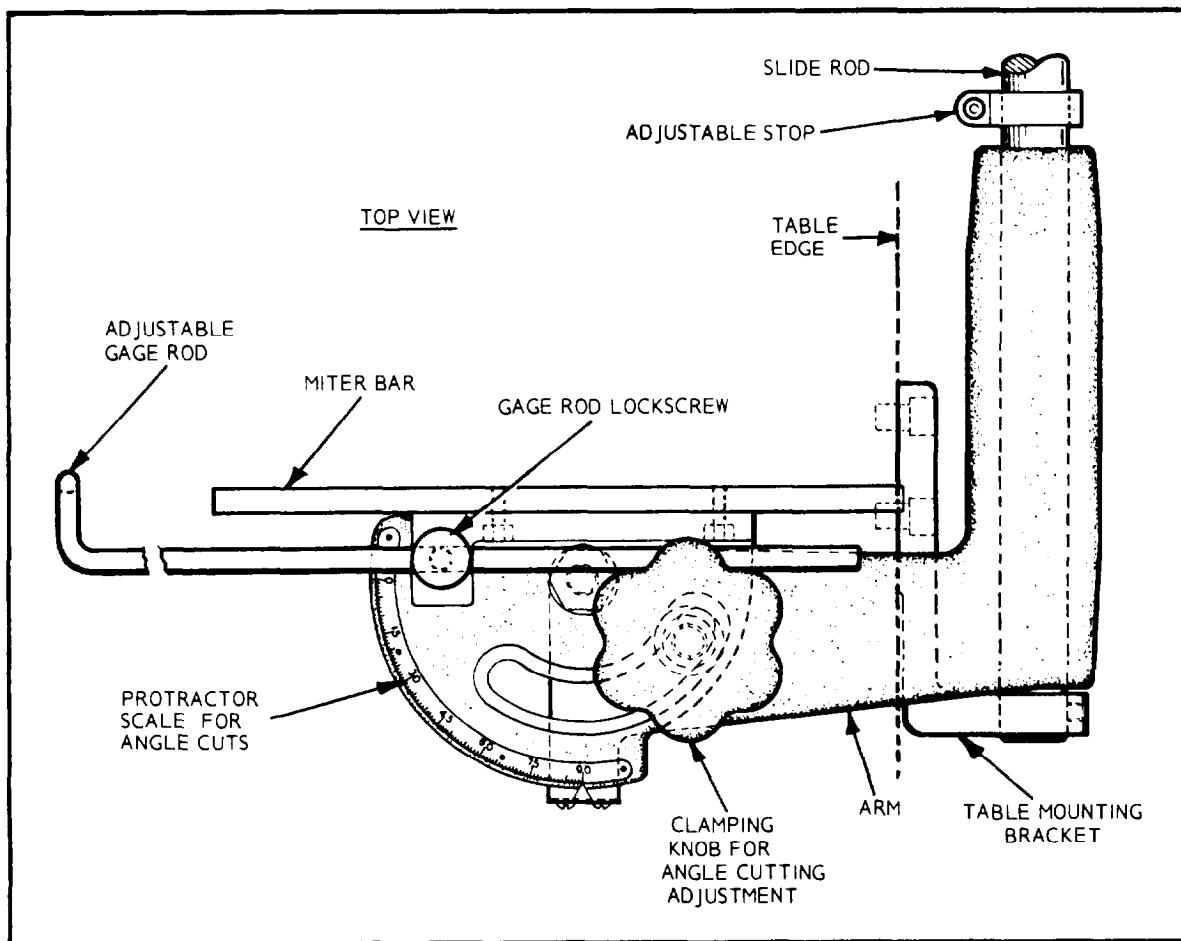


Fig. 20 - The Side-mounting Miter Accessory.

90" SAW GUIDE BRACKETS

The use of the 90-degree saw guide brackets permits heavy duty cut-off work of material greater in length than the throat capacity of the machine. The 90-degree brackets are mounted on the post and lower keeper block. The saw guides are then mounted on the brackets. The saw band is twisted 90 degrees as it travels through the saw guide inserts.

Use the correct size saw guides and inserts for the width of the saw band being used. Operate the machine at speeds under 1500 fpm. High speeds will cause excessive insert wear and shorten band life.

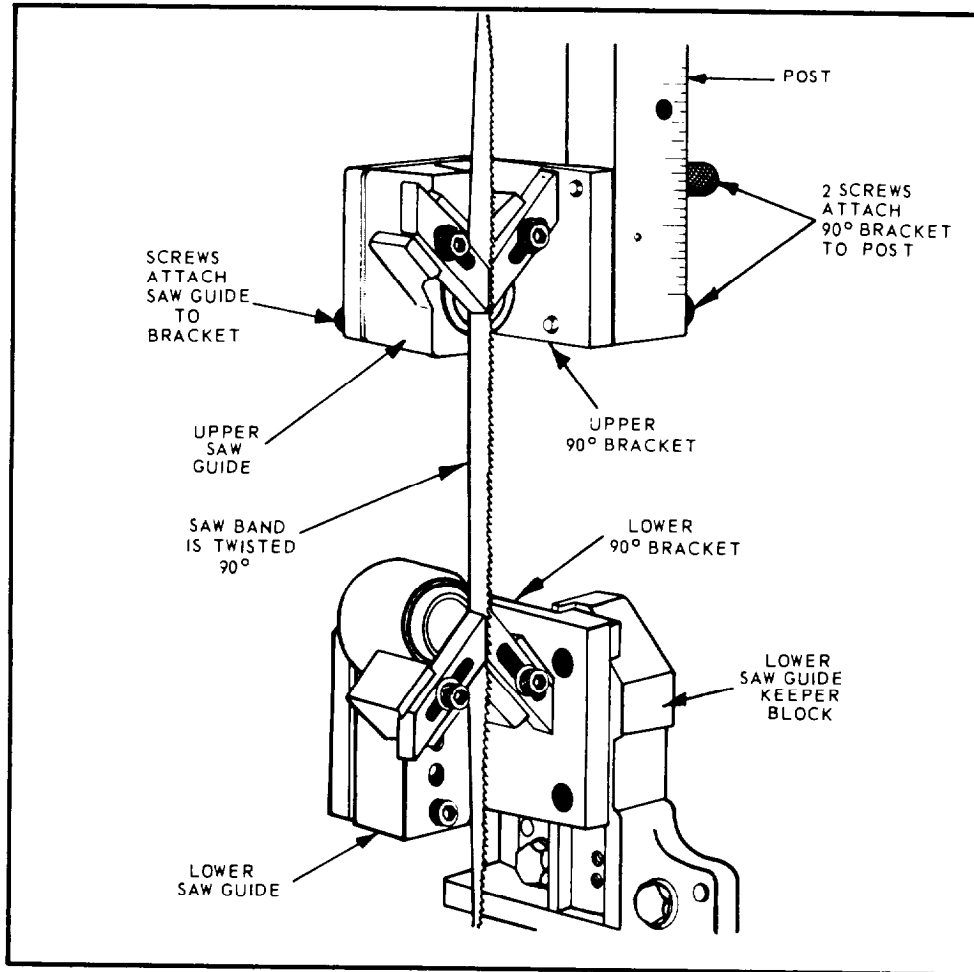


Fig. 21 - Install the 90° Saw Guide Brackets.

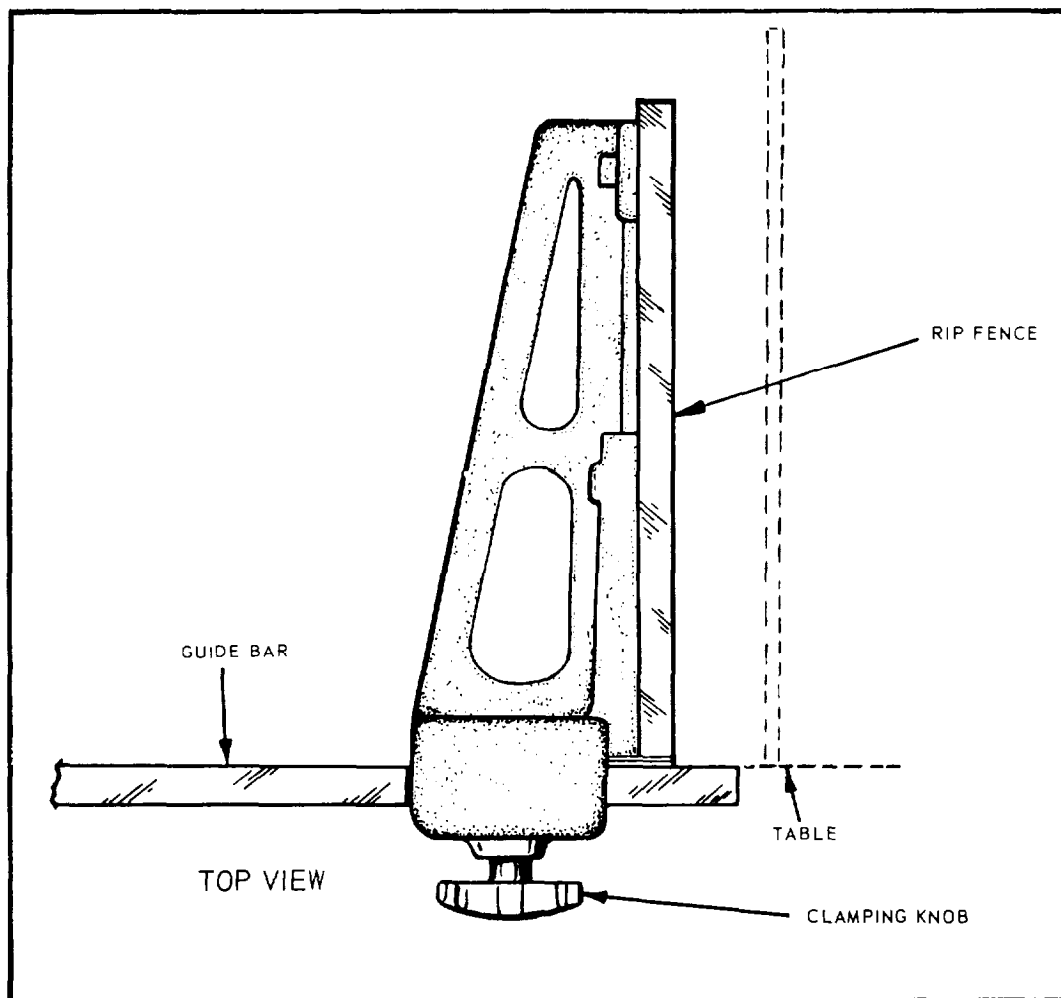


Fig. 22 - Rip fence

RIP FENCE

Set up this accessory as shown in the drawing, Square the fence so that it is line with the table slot. Also make sure that the machine is in proper alignment as described in Installation, Chapter 1.

In making a long cut, check to be sure that the saw band used is not worn on one side. This will cause the work to wander relative to the rip fence guide.

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INSTALLATION

Every consideration should be given to placing Four machine so that the operator will have sufficient room for handling and welding the saw bands. Space should be allowed so that the coiled band will not injure persons passing through the aisles. The welder should also be located so that the welding sparks will not ignite flammable material.

The welder will be supplied in accordance with voltage specified. Full line voltage to the welder will give the best performance. The welder will not operate on Direct Current. A converter must be installed.

Construction-----	rust-proof welded steel
JAWS-----	spring tension control
Blade Capacity-----	from 1/16 in. to 3/4* in. wide x .032 thick
Instantaneous kva-----	4.0
Continuous kva-----	0.5
Welding Voltage-----	3.5volts
Annealing Voltage-----	1.5 volts
Phase-----	single
Operating Current-----	110 volt, 40 amps, 220 v. 20 amps, 440 v. 10 amps or 550 v. 8 amps
Thickness Gage-----	.025 in. and .032 in.
Overall Height-----	16in.
Overall Width-----	8in.
Overall Depth (including jaws)-----	11in.
Grinder Motor-----	110 or 220 volt, 1/4 hp
Grinder Wheel-----	3 x 1/2 x 1/2 in.,
*Capacity on 110 volt is limited to 1/2 in.	

CHAPTER 2

OPERATING FEATURES

GENERAL DESCRIPTION

The butt welder is resistance-type and is capable of welding 3/4 in. wide by .032 gage carbon or Dart saw bands. The two clamping jaws of the welder hold the butted band ends together. When the welding switch lever is pressed, an electric current is induced through the butted ends creating enough heat to soften and join them.

Pressing the welding lever also releases a spring which causes the jaws to force the band ends together. When the movable jaw has moved .065 inches toward the stationary jaw the electric current is automatically cut off. The spring force on the jaws is released when the welding lever is released.

Wider saw bands need greater upsetting force between the jaws than narrow bands and, since too much force on small bands will cause climbing or overlapping of the ends, a jaw upset force selector, located directly above the stationary jaw, provides a variable control.

Directly above the grinding wheel is the annealing pushbutton. When the band is heated up in the butt welding process, the steel at the point of weld air-hardens and is brittle. It is necessary to anneal the weld by reheating and allowing it to cool slowly. This returns the band to an approximation of its original temper.

At the bottom of the panel is a grinding wheel for removing flash from the weld. The wheel guard is exposed at both top and bottom to permit grinding both sides of the weld without having to turn the band over. The gage at the top of the wheel guard is used to check for complete removal of the flash. After grinding, the weld should pass freely through this gage.

CHAPTER 3

OPERATION

PREPARING THE BLADE

- (1) Cut the saw blade to length. Using the blade shear will insure that the blade ends are flat, square and smooth.
- (2) If snips have been used to cut the blade, square the ends before welding. Grind both ends of the saw blade in one operation. Hold the ends so that the teeth point in opposite directions and regardless of the angle of grinding, the two ends will match perfectly when turned over.
- (3) Clean the blade ends carefully. The part of each blade that comes into contact with the welder jaws must be free of all dirt or oil. Any dirt or oil on the blade or welder jaws will prevent good electrical contact.

PREPARING THE WELDER

- (1) Clean the welder jaws.
- (2) The jaw upsetting force selector control (fig. 23) should be set to the correct position for the width of saw blade being welded.

SAW BLADE ALIGNMENT BEFORE WELDING

- (1) If internal sawing is to be done, the blade is inserted through the starting hole in the work. The ends of the saw blade are then brought to the welder to be clamped into the jaws.
- (2) Insert the saw blade between the jaws with the back of the blade against the back of the jaws lining up the blade so that it will be straight after welding.
- (3) The blade ends should meet in the center of the jaw gap without any offset either in thickness or across the width (fig. 24). If the ends are clamped in an offset manner an overlapping weld will result. This type of weld will have to be ground too much, resulting in a weak weld.
- (4) If the contact across the width is not complete when the ends are clamped in the jaws, remove one end and recut it. A misaligned joint will cause an incomplete weld.

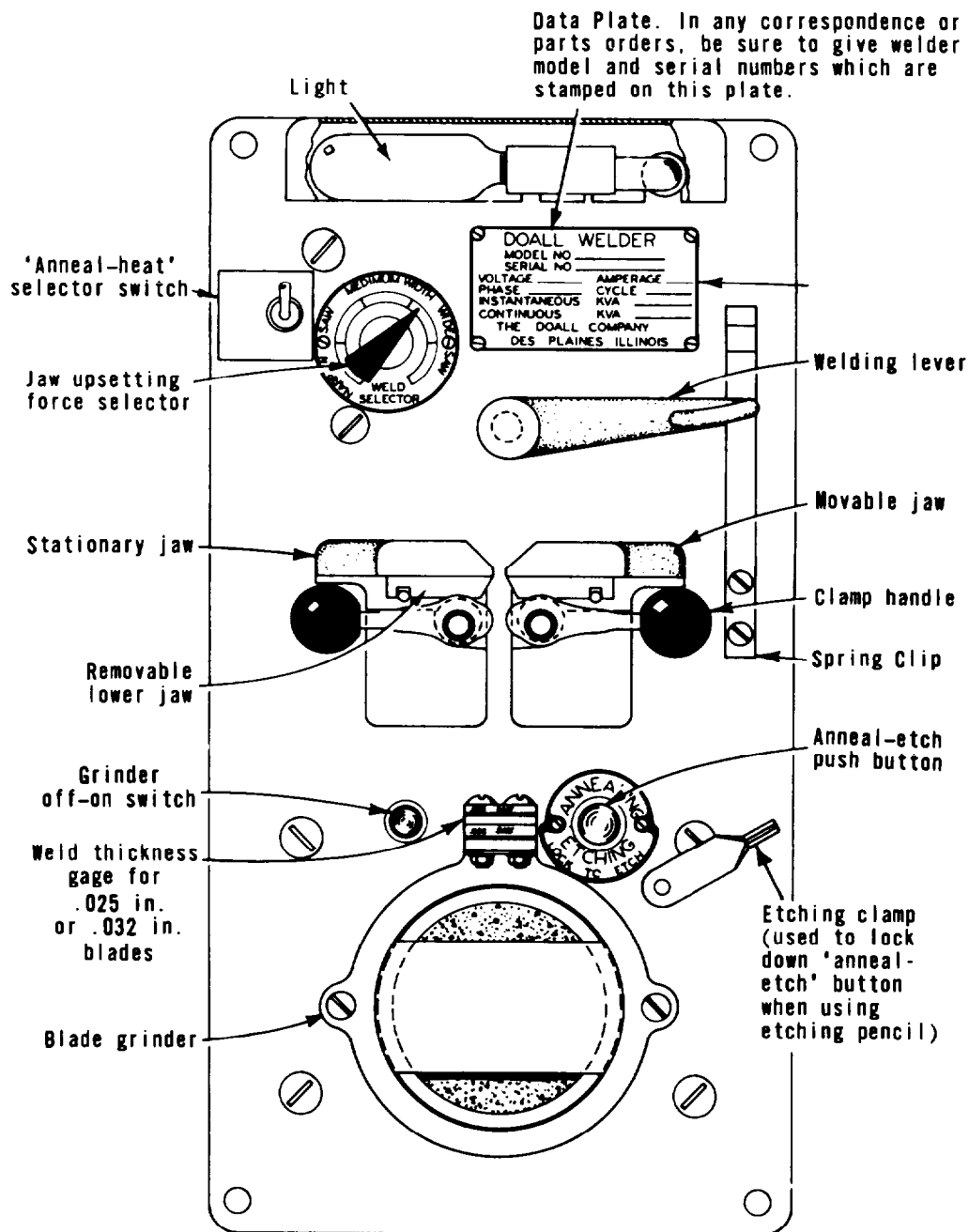


Fig. 23 - Features and controls

(5) After the blade ends are line up, clamp them securely (but not so tightly as to injure the set) between the welder jaws.

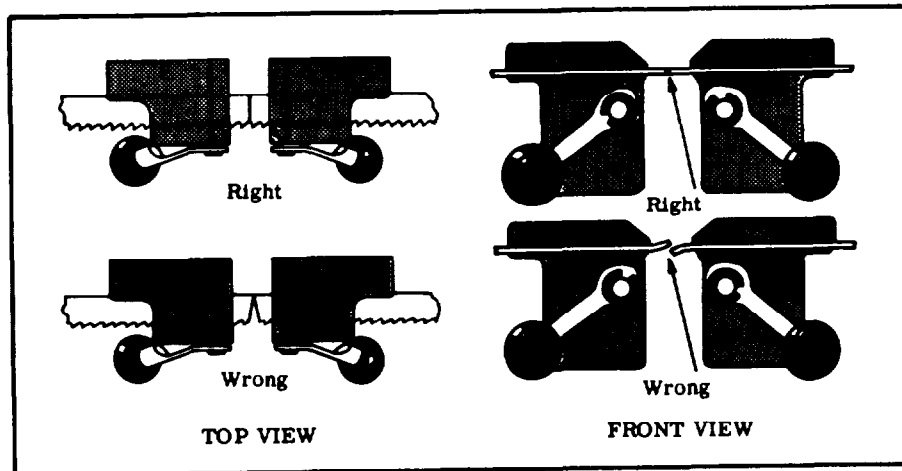


Fig. 24 - Saw blade alignment

WAKING THE WELD

(1) Press and hold down the weld lever (fig. 23) to make the weld. The lever should be held down until the weld has cooled.

(2) Release the stationary jaw clamp before releasing the weld lever. This will prevent scoring the welder jaw surface.

(3) Release the weld lever. When the lever is released, the butt welder mechanism and electrical switches are automatically recocked and the band is ready to be annealed.

(4) Remove the welded saw band. Inspect the weld. If weld is poor, see the Trouble Shooting Chapter.

Cut out the old weld as each new weld is made. One weld only in a saw band is recommended. Use the blade shear to cut away small portions of the ends of the old weld.

Since the welding operation uses up no more than 1/16 in. of the band, it will not shorten appreciably even after several welds have been made. Starting with a full size saw band, approximately 3 to 4 inches of band can be used in making welds before it will be too short to fit over the machine wheels.

If it is found after making a weld that the teeth of the band point in the wrong direction, it can be reversed by turning the band inside out. However, this cannot be done when the band is welded through a piece of material for internal sawing. In this case, the saw band must be cut and properly welded.

CLEAN-UP AFTER WELDING

It is important that the welder jaws be kept clean at all times. The jaws and inserts must be wiped and/or scraped clean after every weld. Doing this will maintain the strength and fatigue characteristics of the band by holding proper alignment, preventing flash from becoming embedded in the band, and preventing shorts or poor electrical contact.

INSPECTION OF THE WELD

When the band is removed from the welder it should be inspected carefully. The color of the upset material around the weld should be blue-gray and of equal intensity throughout. The spacing of the teeth should be uniform and the weld should be located in the center of the gullet. Major jaw misalignment is easily noted at this time from the weld appearance. See the Trough Shooting Chapter if the weld is imperfect.

GRINDING THE WELDED BAND

After welding, the band must be dressed to remove excess metal or flash from the weld. Grind the welded area down to the same thickness as the rest of the band. With the teeth facing out, grind the weld as shown in fig. 25.



Fig. 25 - Grinding the weld

Care must be taken during grinding so as not to hit the teeth, grind deeper than the thickness of the band, or burn or overheat the weld area. The weld should pass freely through the gage above the grinding wheel.

CAUTION: Use care in handling the band; the weld is brittle because it has not yet been annealed.

ANNEALING THE WELDED BAND

When the band is heated up in the welding and grinding processes the steel at the weld is "air-hardened" and is brittle. Therefore, it is necessary to anneal the weld.

(1) Clean the welder jaws.

(2) Press the spring clip (fig. 23) behind the weld lever and move the lever up all the way.

(3) Clamp the band just back of the teeth.

(4) Set the "anneal heat" selector switch (fig. 23) at either the 1/16" to 1/2" or 5/8" to 3/4" position, according to the width of blade being annealed.

(5) CAUTION: Follow these instructions carefully.

(a) For Carbon Blade: Press and jog the anneal switch push button (fig. 23) until the weld is a "dull cherry" to "cherry red" color. Allow the blade to cool slowly by decreasing the jogging frequency.

(b) For Dart Blade: Heat the blade slowly until the weld becomes a deep blue color. Continue to heat by jogging the anneal switch push button until the width of the blue color is one-half the length of band exposed between the jaws. Do not overheat or the temper of the band adjacent to the weld will be damaged. Cool quickly by releasing the button.

WELDER ADJUSTMENTS (fig. 26 & 27)

(1) Cut-off timing adjustment. The most important adjustment on the welder is the setting of the length of time the current flows through the jaws.

WARNING: Before servicing the butt welder, be sure to disconnect from the electric power.

"Incomplete" and "burned out" welds are a result of incorrect timing adjustments. If the weld cycle is cut off too soon, the weld will be incomplete (low heat produces a weak weld which may be only partly jointed). Too long a weld cycle will produce excessive heat which will result in a "burned out" weld (excess molten metal around a poor joint). See Trouble Shooting Chapter for improper welds.

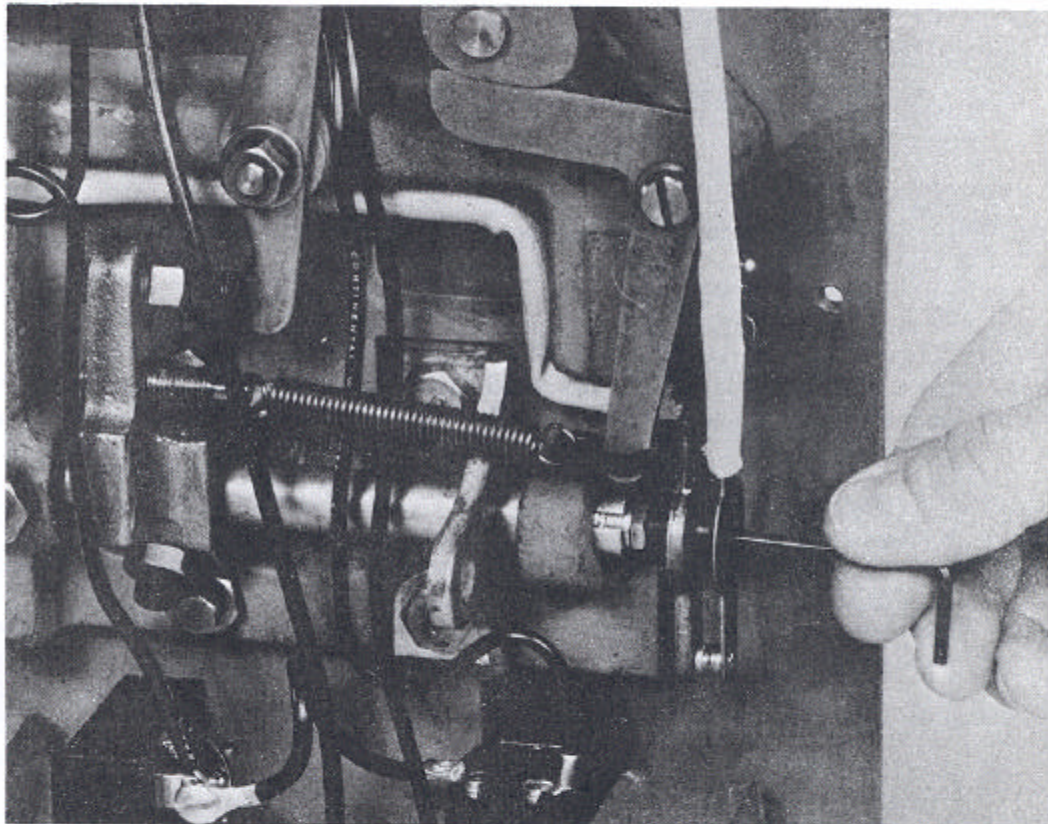


Fig. 26 - Cut-off timing adjustment

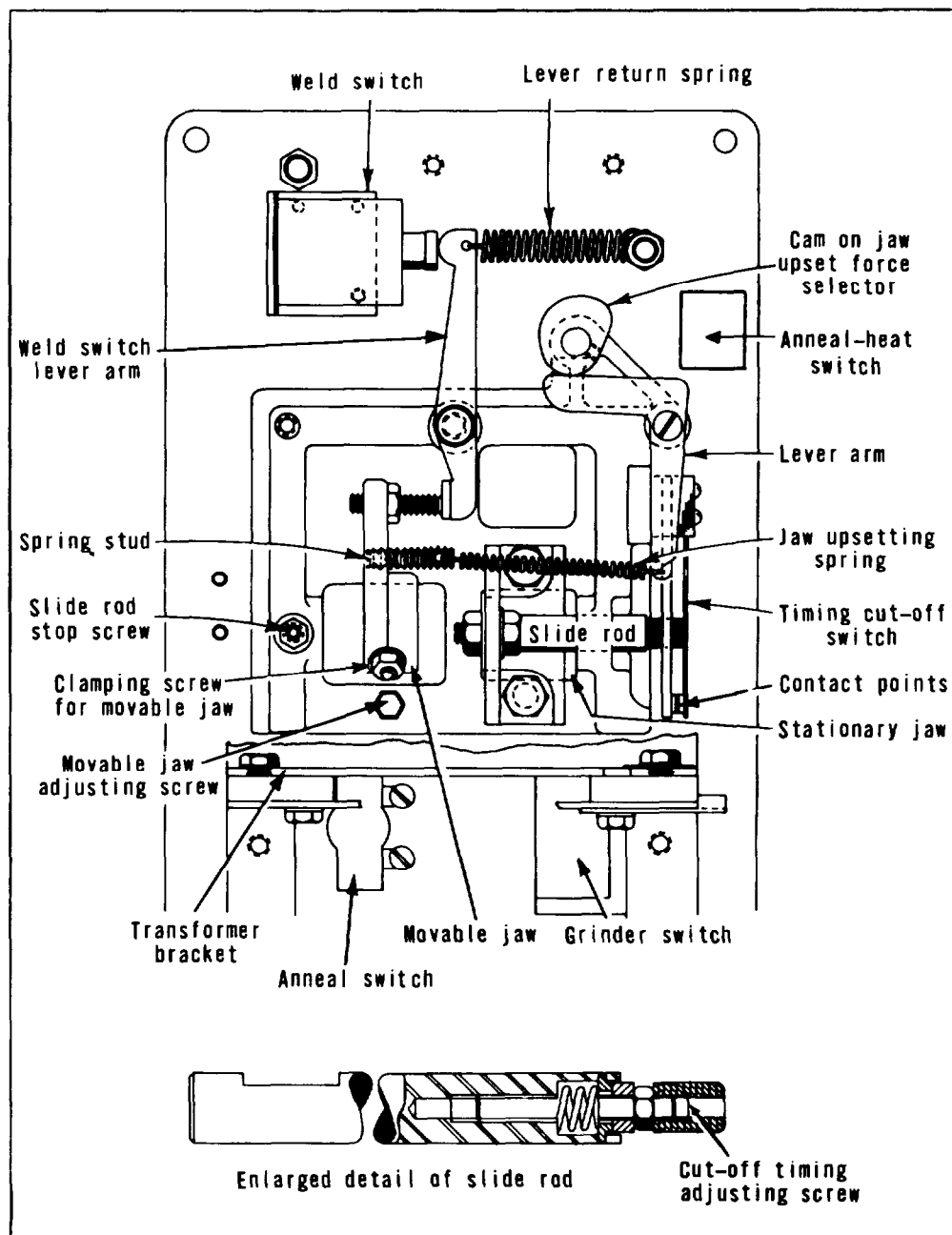


Fig. 27 - Adjustment and service locations

A hole in the outside leaf of the cut-off switch permits insertion of an Allen wrench into the end-knob of the slide rod. A clockwise rotation of this knob produces a slower breaking of the welder circuit. This will produce more heat at the point of the weld. A counterclockwise adjustment will allow less heat. To adjust the timing proceed as follows:

(a) Disconnect electric power.

(b) Remove the welder from the machine frame.

(c) Press the welding lever and check the cut-off switch. There should be a gap between the contact points of 1/32 in. to 3/64 in. Adjust with the Allen wrench if necessary (see fig. 26).

(d) Connect electric power.

(e) Make a sample weld. A "burned out" weld indicates that the adjusting screw should be turned out. An "incomplete" weld indicates that the screw should be turned in. Use 1/2 inch wide saw band for sample welds.

(2) Jaw alignment. The importance of accurate jaw alignment cannot be overemphasized. The jaws have been carefully aligned during assembly at the factory; however, it may be necessary to align the jaws if they are refaced or are bumped or damaged. The easiest and most effective way to see if misalignment exists is to actually inspect the welded joint. A misaligned weld is usually caused by worn or dirty welder jaws.

(a) Check with a straight edge to see if the jaws are in alignment with each other with respect to elevation, inclination and twist.

(b) The stationary jaw (fig. 27) can be moved slightly on its mounting screws by loosening the screws and tapping the jaw.

(c) The movable jaw tilt is adjusted with two set screws as shown in fig. 28. Loosen the lock nuts on the screws before turning them. The movable jaw can be moved up or down in a vertical arc by adjusting the set screws. These set screws also position button bearings in back of the movable jaw; consequently, if the position of the jaw is moved, care must be taken that the bearings are not set up too tight.

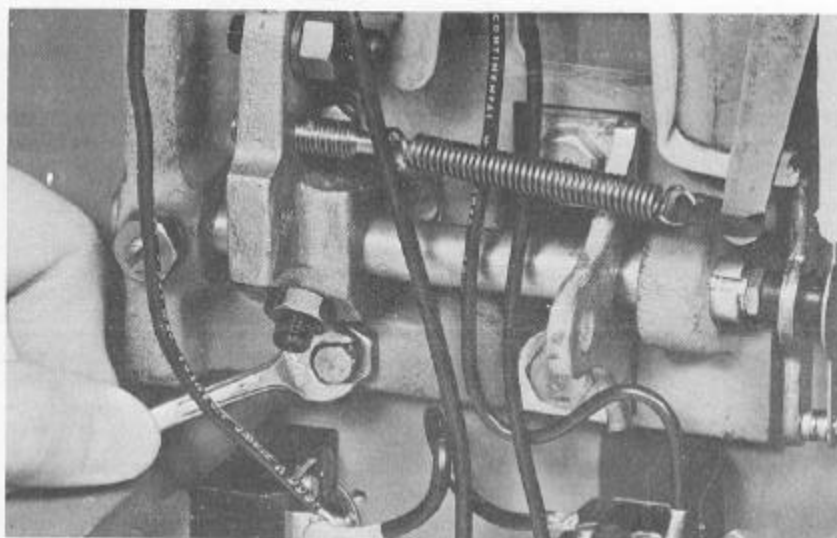


Fig. 28 - Adjusting tilt of movable jaw

If the position of the stationary jaw is changed, make certain that the gap or opening between the jaws is .140 in. in the open position. If not, adjust the jaw gap as described in (3) "Jaw gap adjustment".

Factory alignment procedure is to align the two jaws as close as possible, then lock them in place and file the band contact surfaces of both jaws together.

(3) Jaw gap adjustment. Adjust jaw gap and spring tension as follows: With slide rod pushed to extreme left, (facing front of welder) against the dog point set screw, adjust movable jaw on slide rod and lock in place to achieve .075 clearance between the jaws. This will be minimum jaw gap. Next bring the welding lever (fig. 23) up to bottom of shoulder on the spring clip, then adjust set screw to achieve .140 gap between jaws. This will give a total travel of .065. For annealing, depress lower portion of spring clip against frame and lift lever up. Full open gap in anneal position will be approximately $15/32$ ".

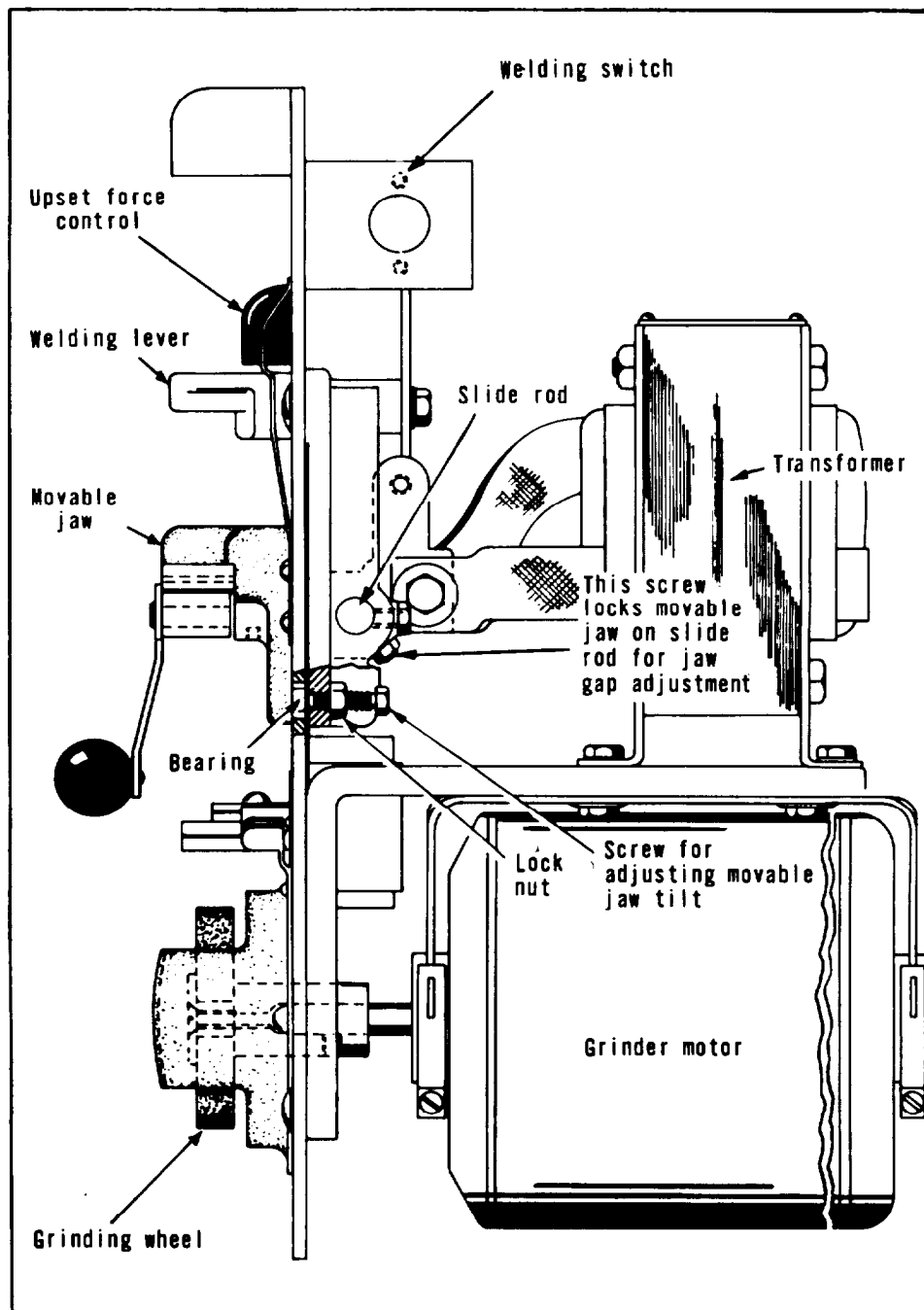


Fig. 29 - Movable jaw adjustment for tilt and gap

CHAPTER 4

MAINTENANCE

LUBRICATION

(1) Slide Rod - Keep slide rod clean and oiled to prevent sticking.

(2) Oil lightly all moving parts at pivot points.

The grinder motor is permanently lubricated.

SLIDE ROD MAINTENANCE

The slide rod should be kept clean and oiled. Rust or dirt may cause the rod to stick and "burn out" the weld.

Check to see that the movable jaw has a free movement of .065". A drop of oil on the slide rod which is worked along by repeated pressing of the lever may correct this trouble. If it does not, remove the slide rod and clean it. Before removing the slide rod, clamp a piece of saw band securely between the welder jaws to maintain the .140" spacing between them.

The slide rod stop screw (fig. 27) should not be so tight that it binds on the slide rod. Turn screw in, then back off 3/4 turn.

WELDER JAWS

To secure consistent results, the welder jaws must be kept clean. During the welding cycle, excess metal in the form of incandescent particles is blown out of the weld, causing a scale or flash to build up on the welder jaws. The welder will not weld properly unless the jaws are wiped clean after every weld.

Misalignment of the weld is usually caused by worn or dirty jaws. However, if the welder jaws are clean and not worn and the welds are out of line, then the jaws are not aligned properly. This misalignment can be determined by inspection of the weld after the flash has been removed. After determining which jaw is not in alignment, the jaws can be adjusted as desired. See "Jaw Alignment" in Operation Chapter. Replace lower jaws that are worn excessively.

CUT-OFF SWITCH AND WELD SWITCH CONTACT POINTS

If the weld switch (fig. 27) contact points are welded together, pitted, corroded, or covered by oxide, they must be replaced. If the points are only dirty, clean them with a commercial point cleaner and a clean, lintless cloth (such as linen tape).

CHAPTER 5

TROUBLE SHOOTING

MISALIGNED WELD - Blade ends not butted (fig. 30).

- (1) Dirt or flash scale on jaws. Wipe or scrape jaw faces clean.
- (2) Blade ends not cut off square.
- (3) Blade ends not correctly aligned when clamped in jaws, see Operation Chapter.
- (4) Worn jaw faces. Replace or repair as described in Maintenance.
- (5) Jaws not aligned correctly, see Maintenance Chapter.

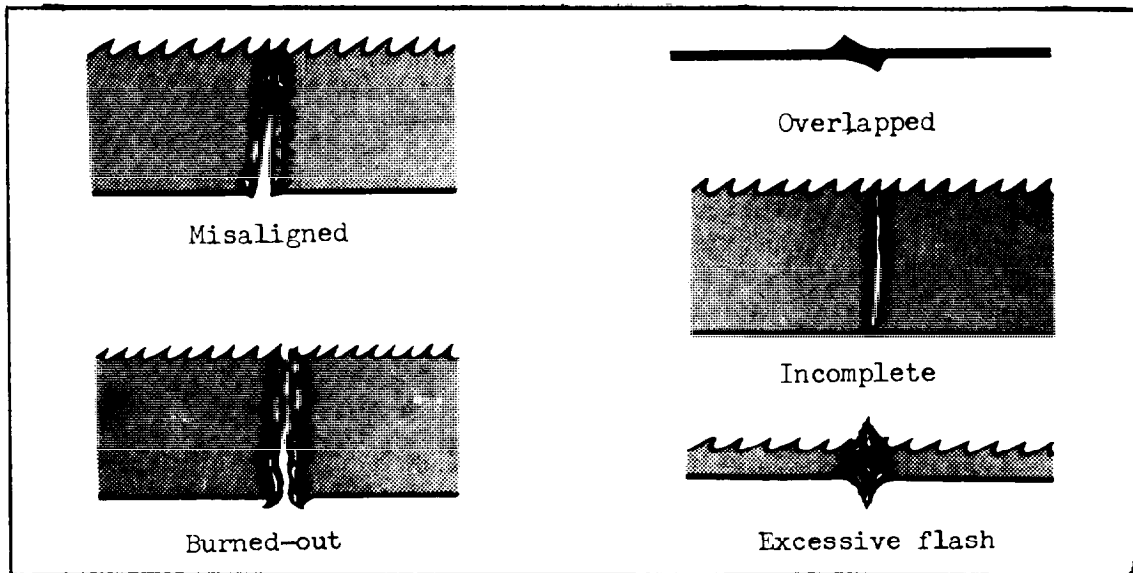


Fig. 30 - Defective welds

MISALIGNED WELD - Blade ends overlapped (fig. 30).

- (1) Jaw upset force control set for wider blade than used, adjust correctly.
 - (2) Blade ends or jaws not aligned correctly, see alignment procedures in Operation Chapter.
 - (3) Jaw upset spring replaced by incorrect spring which is too strong.
- Jaw upset spring stud turned in too far, increasing upsetting force.

INCOMPLETE WELD - Weak weld not completely jointed (fig. 30)

(1) Cut-off switch not adjusted correctly. Adjust switch as described in Operation Chapter under "Cut-off timing adjustment".

(2) Jaw upsetting force may be too low, this could be caused by:

(a) Upsetting force selector set for narrower blade width than is being welded.

(b) Weak or wrong type upset spring.

(c) Upset spring stud not adjusted correctly: if stud is backed out too far, upsetting force will be reduced.

(d) Slide rod sticking or obstructed.

(3) Low voltage. Welding voltage across jaws should be 3-1/2 volts. Check for low incoming voltage to machine.

(4) Jaw spacing may be too great. Jaw gap should be .140 in. before welding.

"BURNED-OUT" WELD - Joint is not complete, excess metal around joint (fig. 30).

(1) Defective cut-off switch may not break the circuit at end of welding operation. Replace cut-off switch,

(2) Cut-off switch not adjusted correctly. Adjust switch as described in Operation Chapter.

(3) Points of cut-off switch welded together. Replace switch.

(4) Slide rod sticking because of rust or dirt. Clean and oil rod - see Maintenance Chapter.

(5) Slide rod movement obstructed because stop screw (fig. 27) too tight on rod. Stop screw should be turned in tight, then backed off 1/2 to 3/4 turn.

(6) Jaw movement obstructed by kinked jaw cable or tangled wires. Bend cable and untangle wires.

(7) Movable jaw binding on jaw bearings because of tilt adjustment screw turned in too far. See "Jaw Alignment" in Operation Chapter.

(8) High voltage, check for too high incoming voltage to machine. Welding voltage across jaws should be 3-1/2 volts.

EXCESS FLASH - Upset metal around welds in 1/16 in. to 1/8 in. blades (fig. 30).

(1) Jaw travel may be too great for narrow blades. Try leaving a 1/64 in. gap between the blade ends, this will reduce jaw travel.

WEAK, BRITTLE WELDS

(1) Weld has not been annealed sufficiently, see "Annealing" in Operation Chapter. Poor annealing can be caused by:

(a) Incorrect annealing heat. Bring weld up to correct color as 'described under "Annealing" in Operation Chapter.

(b) Scale or oil on weld can cause a slow annealing heat.

(2) Low voltage. Check incoming voltage to machine.

WELD BREAKS WHEN USED

(1) Incorrect annealing. Annealing heat may be too low or too high, see Operation Chapter.

(2) Weld has been ground too thin.

(3) "Incomplete" or "burned-out" weld.

CHAPTER 6
ACCESSORIES

ETCHING PENCIL

The etching Pencil is used with the butt welder to mark tools, jigs, fixtures, templates, etc.

Instruction for using the etching pencil are as follows:

- (a) Clamp the cable terminal strip of the etching pencil in the welder stationary jaw.
- (b) Press the anneal and etching pushbutton and clamp the button down with the etching pencil clamp. This closes the circuit through the welder and also grounds the etching current through the machine.
- (c) Place the work to be marked on the table of the machine. Since the machine is "grounded" there is no second lead required to the work.
- (d) Etch with sufficient pressure to prevent the point from arcing, but not great enough to destroy the copper point. The copper point should be kept sharp to secure best results.
- (e) Be sure to unlock the "anneal-etch" button after etching.

APPENDIX A

BASIC ISSUE ITEMS LIST

Section I. PREFACE

1. General

This appendix is a list of basic issue items. It is composed of those items which make up the major end item of equipment and the operator's tools and equipment that are issued with the equipment and are required for stockage.

2. Requisitioning a Part to Which FSN Has Not Been Assigned

When requisitioning a C source (local procurement) item identified only by a manufacturer's part number, it is mandatory that the following information be furnished the supply officer:

a. Manufacturer's code number (5-digit number preceding the colon in the descriptive column).

b. Manufacturer's part number (the number, and sometimes letters, following the colon, (a) above). Dashes, commas, or other marks must be included exactly as listed.

c. Nomenclature exactly as listed herein, including dimensions if necessary.

d. Name of manufacturer of the end item (from cover of TM or manufacturer's nameplate).

e. Federal stock number (from TM).

f. Manufacturer's model number (from TM or name/data plate, preferably name/data plate).

g. Manufacturer's serial number (from name/data plate).

h. Any other information such as type, frame number, and electrical characteristics, if applicable.

i. If DD Form 1348 is used, fill in all blocks except 4, 5, and 6, and Remarks field, in accordance with AR 725-50. Complete form as follows:

cordance with AR 725-50. Complete form as follows:

- (1) In blocks 4, 5, and 6, list manufacturer's code and manufacturer's part number (as listed in description column).
- (2) In Remarks field, list noun name (repair part), end item application (FSN of end item), manufacturer, model number (end item), serial number (end item), and any other pertinent information such as frame number, type, etc.

3. Explanation of Columns

a. *Source, Maintenance, and Recoverability Code (Col. 1).*

- (1) *Materiel numerical code (col. 1a).* This column is not required.
- (2) *Source (col. 1b).* This column indicates the selection status and source for the listed item. Source codes used in this list are--

Code	Explanation
C -----	Obtain through local procurement. If not available from local procurement, requisition through normal supply channels with a supporting statement of nonavailability from local procurement.
P -----	Applied to repair parts which are stocked in or supplied from the GSA/DSA, or Army supply system, and authorized for use at indicated maintenance categories.

- (3) *Maintenance level (col. 1c).* This column indicates the category of maintenance authorized to install the listed item. Maintenance level code used in this list is:

Code	Explanation
C -----	Operator and crew maintenance

- (4) *Recoverability (col. 1d)*. This column indicates whether unserviceable items should be returned for recovery or salvage. When no code is indicated, the item will be considered expendable. Recovery code used in this list is:

Code Explanation
R ----- Items which are economically repairable at direct and general support maintenance activities and normally are furnished by supply on an exchange basis.

b. *Federal Stock Number (Col. 2)*. Self explanatory.

c. *Description (Col. 3)*. This column indicates the Federal item name (shown in capital letters) and any additional description required for supply operations. The manufacturer's code and part number are also included for reference.

Code Explanation
18056 ----- DoAll Company

d. *Unit of Issue (Col. 4), Quantity Authorized (Col. 5), and Illustrations (Col. 6)*. Self explanatory.

4. Abbreviations

c ----- cycle(s)
deg ----- degree(s)
ea ----- each
fl ----- flat
flex. ----- flexible
hdl ----- handle(d) (s)
max ----- maximum
mtg ----- mounting
ph ----- phase
v ----- volt(s)
w ----- wide, width
w/ ----- with

5. Errors, Comments, and/or Suggestions

Reports of errors, comments, and/or suggestions are encouraged. They should be submitted on DA Form 2028 and forwarded direct to Commanding General, Headquarters, U.S. Army Weapons Command, ATTN: AMSWE-SMM-TE, Rock Island Arsenal, Rock Island, Ill. 61201.

Section II. BASIC ITEMS LIST

(1) Source, maintenance, and recoverability code				(2) Federal stock number	(3) Description	(4) Unit of issue	(5) Quantity authorized	(6) Illustration	
(a) Material code	(b) Source	(c) Maintenance level	(d) Recoverability					(a) Figure number	(b) Item number
			R	3419-542-1328	MAJOR COMBINATION SAW, BAND, METAL CUTTING: floor mtg, 24 in. throat depth, 1 in. max band saw blade accommodated, 1/2 in. max band file accommodated, 26 X 26 work table tilt type table, 220-v, 60-c, 3-ph, w/integral butt welder and grinder (DoAll Company Model 2612-1M) (3419- 642-1328).				
					COMPONENTS OF MAJOR COMBINATION None authorized. SPARE PARTS				
	C	C			BELT DRIVE: multi-speed, motor to transmission (18066 :D2878).	ea	2		

(1) Source, maintenance, and recoverability code				(2) Federal stock number	(3) Description	(4) Unit of issue	(5) Quantity authorized	(6) Illustration	
(a) Material code	(b) Source	(c) Maintenance level	(d) Recoverability					(a) Figure number	(b) Item number
					SPARE PARTS-Continued BELT DRIVE:-Continued				
	C	C			BELT, DRIVEN: multi-speed, transmission to drive wheel (18056:D35-803).	ea	2		
	C	C			BELT, V: air pump (18056:D35-7714).	ea	2		
					TOOLS AND EQUIPMENT FOR: SAW, BAND, METAL CUTTING (18056:2612-1M)				
	C	C			ADAPTER, GUIDE : file (18056 :1371).	ea	1	31	18
	C	C			ATTACHMENT, MITER: 0 to 90 deg (18056 :55-304).	ea	1	31	7
	P	C		3419-367-8614	BACKUP, FILE GUIDE : (18056 :34-09312).	ea	2	31	15
	C	C			BACKUP, POLISHING GUIDE : (18056:34-10402).	ea	2	31	S0
	C	C			BAND, FILE: fl, bastard cut, $\frac{3}{8}$ w, 171 lg, 12 teeth per in. (18056:311-126).	ea	1		
	C	C			BAND, FILE : fl, bastard cut, $\frac{3}{8}$ w, 171 lg, 20 teeth per in. (18056:311-167).	ea	1		
	P	C		3455-254-8561	BAND, FILE: half rd shape, bastard cut, $\frac{3}{8}$ w, 171 lg, 16 teeth per in. (18056:241).	es	1		
	P	C		3455-254-8562	BAND, FILE: oval shape, bastard cut, $\frac{1}{4}$ w, 171 lg, 24 teeth per in. (18056:282).	ea	1		
	P	C		3455-234-9215	BAND, FILE: oval shape, bastard cut, $\frac{3}{8}$ w, 171 lg, 10 teeth per in. (18056:183).	ea	1		
	P	C		3455-234-9213	BAND, FILE: oval shape, bastard cut, $\frac{3}{8}$ w, 171 lg, 14 teeth per in. (18056:209).	ea	1		
	P	C		3455-254-8563	BAND, FILE: oval shape, bastard cut, $\frac{1}{2}$ w, 171 lg, 10 teeth per in. (18056:068).	ea	1		
	P	C		3455-254-8564	BAND, FILE: oval shape, bastard cut, $\frac{1}{2}$ w, 171 lg, 14 teeth per in. (18056:084).	ea	1		
	C	C			BAND, POLISHING: cloth, al-oxide, 150 grit 1 w, 175 lg (18056:737-401208).	ea	12	31	20
	C	C			BAND, POLISHING: cloth, al-oxide, 80 grit, 1 w, 175 lg (18056:737-400754).	ea	12		
	C	C			BAND, POLISHING: cloth, al-oxide, 50 grit, 1 w, 175 lg (18056:737-400309).	ea	12		
	P	C		3455-277-3540	BLADE, BAND SAW: flex. back, raker set, $\frac{3}{32}$ w, 0.025 thk, 18 teeth per in., 100 ft coil (18056:306-084).	ea	1		
	P	C		3455-277-3542	BLADE, BAND SAW: flex. back, raker set, $\frac{1}{8}$ w, 0.025 thk, 14 teeth per in., 100 ft coil (18056:306-100).	ea	1		
	P	C		3455-224-3591	BLADE, BAND SAW: flex. back, raker set, $\frac{1}{8}$ w, 0.025 thk, 18 teeth per in., 100 ft coil (18056:306-126).	ea	1		

(1) Source, maintenance, and recoverability code				(2)	(3)	(4)	(5)	(6) Illustration	
(a) Material code	(b) Source	(c) Maintenance level	(d) Recoverability	Federal stock number	Description	Unit of issue	Quantity authorized	(a) Figure number	(b) Item number
					TOOLS AND EQUIPMENT FOR:- Continued BAND SAW, METAL CUTTING- Continued				
	P	C	-----	3455-277-3544	BLADE, BAND SAW: flex. back, raker set, $\frac{7}{16}$ w, 0.025 thk, 10 teeth per in., 100 ft coil (18056:306-167).	ea	1		
	P	C	-----	3455-277-3545	BLADE, BAND SAW: flex. back, raker set, $\frac{7}{16}$ w, 0.025 thk, 14 teeth per in., 100 ft coil (18056:306-183).	ea	1		
	P	C	-----	3455-278-0924	BLADE, BAND SAW: flex. back, raker set, $\frac{1}{4}$ w, 0.025 thk, 10 teeth per in., 100 ft coil (18056:306-225).	ea	1		
	P	C	-----	3455-277-3552	BLADE, BAND SAW: flex. back, raker set, $\frac{5}{8}$ w, 0.025 thk, 8 teeth per in., 100 ft coil (18056:306-408).	ea	1		
	P	C	-----	3455-224-3594	BLADE, BAND SAW: flex. back, raker set, $\frac{5}{8}$ w, 0.025 thk, 10 teeth per in., 100 ft coil (18056:306-324).	ea	1		
	P	C	-----	3455-224-3595	BLADE, BAND SAW: flex. back, raker set, $\frac{5}{8}$ w, 0.025 thk, 18 teeth per in., 100 ft coil (18056:306-365).	ea	1		
	P	C	-----	3455-277-3555	BLADE, BAND SAW: flex. back, raker set, $\frac{1}{2}$ w, 0.025 thk, 6 teeth per in., 100 ft coil (18056:306-381).	ea	1		
	P	C	-----	3455-204-1671	BLADE, BAND SAW: flex. back, raker set, $\frac{1}{2}$ w, 0.025 thk, 10 teeth per in., 100 ft coil (18056:306-407).	ea	1		
	P	C	-----	3466-224-3596	BLADE, BAND SAW: flex. back, raker set, $\frac{1}{2}$ w, 0.025 thk, 14 teeth per in., 100 ft coil (18056:306-423).	ea	1		
	P	C	-----	3455-233-8281	BLADE, BAND SAW: flex. back, raker set, $\frac{5}{8}$ w, 0.032 thk, 10 teeth per in., 100 ft coil (18056:306-480).	ea	1		
	P	C	-----	3455-233-8235	BLADE, BAND SAW: flex. back, raker set, $\frac{5}{8}$ w, 0.032 thk, 14 teeth per in., 100 ft coil (18056:306-506).	ea	1		
	P	C	-----	3455-247-8772	BLADE, BAND SAW: flex. back, raker set $\frac{3}{4}$ w, 0.032 thk, 8 teeth per in., 100 ft coil (18056:306-563).	ea	1		
	C	C	-----		BLOCK, ANGLE : 90 deg saw guide, lower (18560:27596).	ea	1	31	9
	C	C	-----		BLOCK ANGLE : 90 deg saw guide, upper (18056:27597).	ea	1	31	11
	C	C	-----		BRACKET, UTILITY SAW: front (18056:29584).	ea	1	31	26
	C	C	-----		BRACKET, UTILITY SAW: rear (18056: 29583).	ea	1	31	27

(1) Source, maintenance, and recoverability code				(2)	(3)	(4)	(5)	(6) Illustration	
(a) Material code	(b) Source	(c) Maintenance level	(d) Recoverability	Federal stock number	Description	Unit of issue	Quantity authorized	(a) Figure number	(b) Item number
					TOOLS AND EQUIPMENT FOR:- Continued				
					BAND SAW, METAL CUTTING- Continued				
	C	C	R		CABINET, STORAGE: metal, 15 sections 30 1/4 w, 15 1/4 dup, 80 h (18056:181).	ea	1		
	C	C			COLLAR, STOP: utility saw (18056:11- 28109).	ea	1	31	28
	C	C			CLAMP, GUIDE : rip fence (18056:31449)	ea	1	31	21
	C	C	R		DISK CUTTER: (18056:40044).	ea	1	31	3
	C	C			FEED SCREW: work (18056:35-6212).	ea	1	31	19
	C	C	R		FENCE, RIP: (18056:35-5178).	ea	1	31	1
	C	C			GAGE, INSERT: 1/16 to 1/2 saws, 0.025 thk (18056:34-08320).	ea	3	31	34
	P	C		3419-367-8593	GAGE, INSERT: 5/8 to 3/4 saws, 0.032 thk (18056:13-08303).	ea	3		
	P	C		3419-367-8594	GAGE, INSERT: 5/8 to 3/4 saws, 0.035 thk (18056 :13-08307).	ea	3		
	C	C			GRAPHITE, POWDERED: 16 oz aerosol can (18056:458-140613).	ea	1	31	10
	C	C			GUIDE, BAND : polishing (18056:16686)	ea	1	31	24
	C	C			GUIDE BLOCK, SAW: lower, 1/4 in (18056:11507).	ea	1	31	16
	C	C			GUIDE BLOCK, SAW: lower, 3/4 in (18056:11543).	ea	1	31	14
	C	C			GUIDE BLOCK, SAW: upper, 1/4 in (18056:11519).	ea	1	31	17
	C	C			GUIDE BLOCK, SAW: upper, 3/4 in (18056:11528).	ea	1	31	13
	C	C			GUIDE, FILE : 3/4 X 6 3/4 (18056:27487).	ea	1	31	22
	C	C			GUIDE, FILE: 7/8 X 8 5/8 (18056:27488).	es	1	31	23
	C	C			GUIDE, FILE: 1/2 X 8 5/8 (18056:27489).	ea	1	31	12
	C	C			HOLDER, POST: (18056:7329).	ea	1	31	25
	C	C			INSERT, SAW GUIDE: 1/16 thk (set o 4) (18056:4499).	set	2		
	C	C			INSERT, SAW GUIDE: 3/32 thk (set o 4) (18056:4498).	set	2		
	C	C			INSERT, SAW GUIDE: 1/8 thk (set of 4) (18056:4497).	set	2		
	C	C			INSERT, SAW GUIDE: 3/16 thk (set of 4) (18056:4496).	set	2		
	C	C			INSERT, SAW GUIDE: 1/4 thk (set of 4) (18056:4495).	set	2		
	C	C			INSERT, SAW GUIDE: 3/8 thk (set of 4) (18056:3960).	set	2		
	C	C			INSERT, SAW GUIDE: 1/2 thk (set of 4) (18056:3959).	set	2		

(1) Source, maintenance, and recoverability code				(2)	(3)	(4)	(5)	(6) Illustration	
(a) Material code	(b) Source	(c) Maintenance level	(d) Recoverability	Federal stock number	Description	Unit of issue	Quantity authorized	(a) Figure number	(b) Item number
					TOOLS AND EQUIPMENT FOR:- Continued				
					BAND SAW, METAL CUTTING- Continued				
	C	C			INSERT, SAW GUIDE: $\frac{5}{8}$ thk (set of 4) (18066:3968).	set	2		
	C	C			INSERT, SAW GUIDE: $\frac{3}{4}$ thk (set of 4) (18066:3967).	set	2		
	C	C			JAW, HOLDING: feed screw (18066:6- 13007).	ea	1	31	31
	C	C			PENCIL, ETCHING: electric, 48 in. cable, single terminal (18066:13-07004).	ea	1		
	C	C			PLATE, CENTER: band filing (18066: 10627).	ea	1	31	5
	C	C			PLATE, CENTER: band polishing (18056:10570).	ea	1	31	8
	C	C			PLATE, CENTER: band saw (18066: 29261).	ea	1	31	6
	C	C			ROD, SLIDE: miter attachment (18066: 101936).	ea	1	31	2
	P	C		3419-473-6816	SCREW, BACKUP: polishing band plate (18056:34-09001).	ea	2	31	32
	C	C			SCREW, BACKUP: saw band, upper (18056:35-1603).	ea	2	31	33
	P	C		5120-357-8388	WRENCH, BOX: special, band saw at- tachment, triple opng, off set, $\frac{1}{2}$, $\frac{1}{16}$, and $\frac{7}{8}$ opng (18056:20308).	ea	1	31	29
	C	C			WRENCH, TABLE TRUNION: special, 45 deg bent hdl (18056:10853).	ea	1	31	4

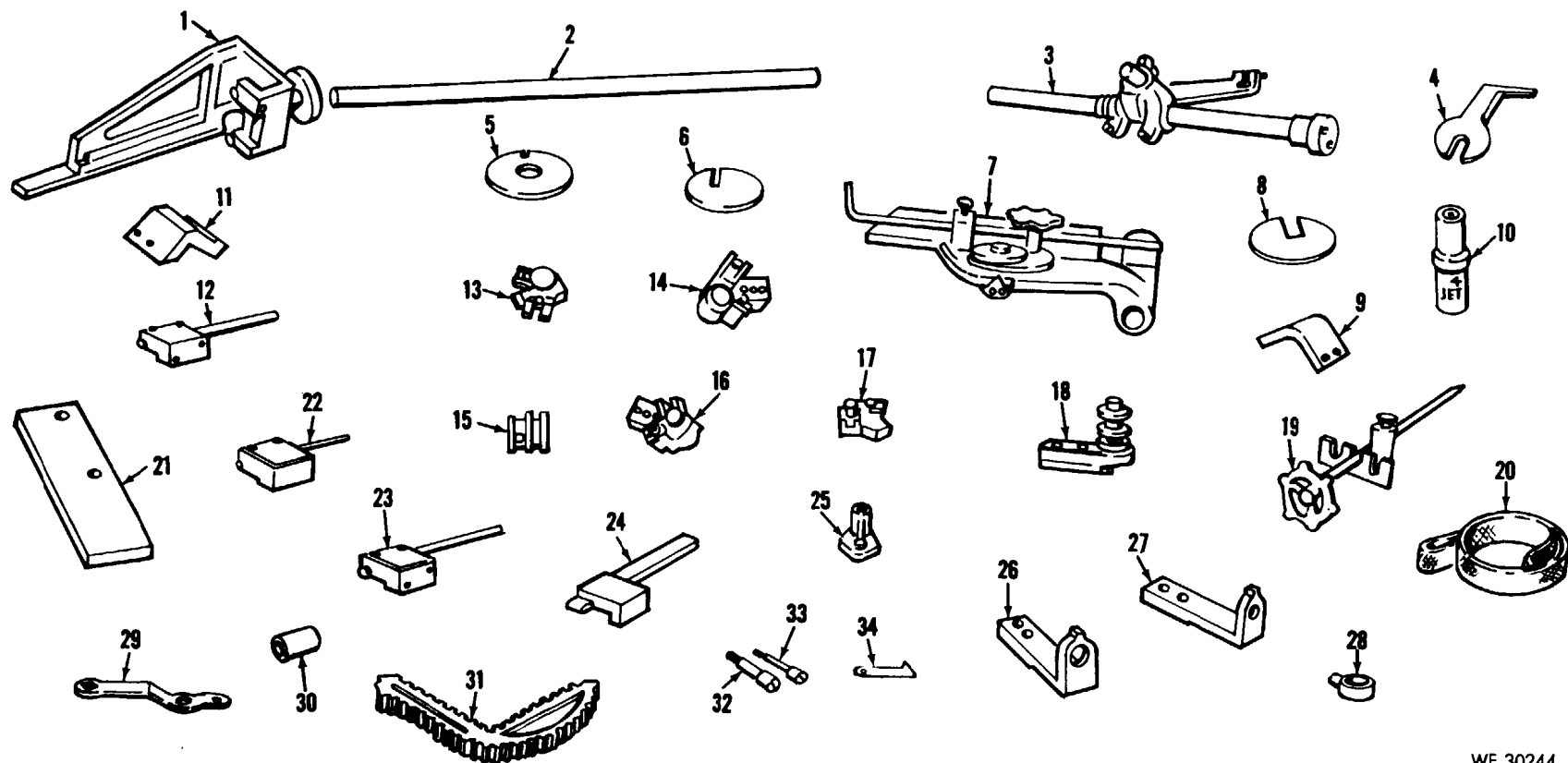


Figure 31. Tools and equipment.

By Order of the Secretary of the Army:

HAROLD K. JOHNSON

*General, United States Army,
Chief of Staff.*

Official :

KENNETH G. WICKHAM

*Major General, United States Army,
The Adjutant General.*

Distribution:

Active Army:

DCSLOG (1)
CNGB (1)
TSG (1)
CofEngrs (2)
CofSptS (2)
Dir of Trans (1)
CC-E (1)
USA Armor Bd (1)
USCONARC (3)
USAMC (2)
USAWECOM (76)
ARADCOM (2)
ARADCOM Rgn (2)
OS Maj Comd (3)
LOGCOMD (3)
USAAVCOM (3)
USAECON (2)
USACDCEC (10)
Armies (3) except
Seventh USA (6)
Eighth USA (5)
Corps (2)
USAC (2)
Instl (USAREUR) (2)
USAEFCB (2)
USAOCS (1)

USAQMCENFL (3)
USASCS (1)
APG (1)
DPG (1)
JPG (1)
WSMR (1)
Ft Story (1)
USAAVNS (5)
USAARMS (5)
Army Dep (3) except
TEAD (5)
LGH (1)
FLDMS (2) except
Ft Knox FLDMS (10)
USDB (2)
USA Human Engr Lab APG (2)
USA Ballistic Rsch Lab (1)
USA Aero Depot Maint (1)
4th USASA Fld Sta (1)
Units org under fol TOE : 2 ea.
11-15
11-17
11-38
11-158
11-587

NG: None.

USA R: None.

For explanation of abbreviations used, see AR 320-50.

☆ U.S. Government Printing Office: 1967—250-507/6596A

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