



# **PARTS AND INSTRUCTION MANUAL**



**MODEL: m, MD, MDX**

## **BAND SAWING MACHINE**

# DAMAGE CLAIM PROCEDURE

## VISIBLE DAMAGE AT TIME OF DELIVERY:

1. Note damage on carrier's delivery receipt. Accept the shipment. It can be returned later if repairs are not possible in the field.
2. Request a "damage inspection" from the delivery carrier:
  - a. The carrier will send his own people or contract an independent agency to make the inspection.
  - b. The inspector will request a signature on the report and leave a copy.
  - c. The carrier "damage inspection" report is not final. If additional damage is found when repairs are started, contact the carrier for another inspection; or at least give them the details of the damage.
3. Do not move the equipment from the receiving area and keep all shipping materials until the carrier "damage inspection" report is complete.
4. If possible, take photographs of the damage and keep them for your file. Photos could possibly prove a claim at a later time.
5. Keep a record of all expenses and be sure they are documented.
6. Repair damage in the field whenever possible. Carriers encourage this to keep expenses down.
7. You have nine (9) months to file a claim.

## CONCEALED DAMAGE:

1. You have fourteen (14) days to report damage not noted at time of delivery.
  - a. Report damage as soon as possible. This makes it easier to prove that it did not happen cosignee's plant.
  - b. Inspect machines carefully before moving from the receiving area. Again if machine is not moved it is easier to prove your case.
2. Request a "damage inspection" from the delivery carrier:
  - a. The carrier will send his own people or contract an independent agency to make the inspection.
  - b. The inspector will request a signature on the report and leave a copy.
  - c. The carrier "damage inspection" report is not final. If additional damage is found when repairs are started, contact the carrier for another inspection; or, at least give them the details of the damage.
3. Do not move the equipment from the receiving area and keep all shipping materials until the carrier "damage inspection" report is complete.
4. If possible, take photographs of the damage and keep them for your file. Photos could possibly prove a claim at a later time.
5. Keep a record of all expenses and be sure they are documented.
6. Repair damage in the field whenever possible. Carriers encourage this to keep expenses down.
7. You have nine (9) months to file a claim.

THE CONTINENTAL DO-ALL, WITH ITS CONTINUOUS CUTTING EFFICIENCY, SIMPLICITY OF OPERATION, AND ENORMOUS SAVING IN TIME, IS FAST BECOMING ONE OF THE MOST ESSENTIAL MACHINES IN THE TOOLROOM. IT ELIMINATES A GREAT AMOUNT OF COSTLY BENCH WORK, AS WELL AS MANY OTHER OPERATIONS ON THE DRILL PRESS, SHAPER, LATHE, JIG MACHINES, ETC.

### INSTALLATION

The DO-ALL METALMASTER should be bolted rigidly to the floor and leveled to insure proper operation of the butt welding unit. Four 5/8" holes are located on the flanged base of the machine for this purpose. It should be placed so that daylight will strike the table over the operator's right shoulder when he is in position for sawing, and over his left shoulder when in the filing position. The machine should be located as near to the toolmakers' benches as possible. When placed in this position it will lend itself readily to many smaller jobs such as cutting off small parts, cutting templates, developing blanks, etc.

### FILING

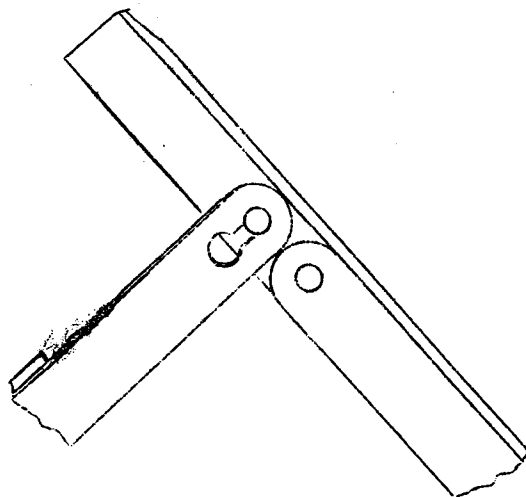
When you receive your type "M" DO-ALL, it is set up with the flat 3/8" file band. The 3/8" wide DO-ALL file bands have a 3/8" wide Swedish spring steel backing, on which are mounted 35 three-inch tool steel file segments. An extra file segment and rivets for repairs, are to be found in the

bag attached to the file band. The length of the file band is 106". ("MD" file bands are 132" long and have 44 segments.)

To remove the file band from the machine, remove the filler plate from the table, raise the post to the top position; release the tension on the file band by lowering the upper wheel, and slip it off the wheel. It is best stored by hanging on a hook from one end. If it is stored in a coil, do not coil it into more than three loops. The half-round, coarse cut file band supplied with the machine is coiled in three loops for shipment.

TO JOIN BAND:

1. The two joint file segments are painted yellow, so that they can easily be located.
2. Hold joints at right angles to each other and engage the locking pin with the slot.
3. Pivot the joint files into position.



TO UNJOIN BAND:

1. Bend joint files until the dovetail ends of the files clear each other.
2. Pivot joint files until at right angles to each other.
3. Disengage the band by sliding the locking pin into the large end of the slot and lifting it off.

To set up the machine for internal filing, remove the filler plate in the table and place the work to be filed with its opening over the slot in the center of the table. If the change in set-up is being made after a sawing operation, the upper and lower saw guides are first removed and the file guide backup channel is put on. The lower extension of the file band backup is inserted in the opening of the work to be filed, and the file band backup is secured to the support post with the two knurled head thumb screws that extend thru the post. The post is then moved to its highest position. Place one end of the file band thru the opening in the work, making sure that the pointed ends of the file segments are downward, and join the file band as described above. Place the file band on the wheels; locate it properly in the backup channel. The file backup is then lowered into position. The filler plate for the table is then replaced. When the filler plate is in place, it must

engage with the end of the file backup channel to give support to the lower end of the backup.

Adjust the tension on the file band enough to make the band rigid, but not taut.

Track the file band on the wheel. It will run on the center of the face, by turning the thumb screw located on the left side of the upper wheel housing. A clockwise rotation of the tilting screw will make the band run to the inside rim of the wheel, while a counter clockwise rotation will make it run to the outside.

The file band should run freely in the backup channel when properly tracked.

### GENERAL OPERATION IN FILING

Any pressure can safely be exerted on the file band, even up to the point where the machine would be stalled. Best results are had from a medium even pressure. For finish filing, a light pressure is best. Speed of filing should be between 50-160 feet per minute. Use the Job Selector Dial for complete information on filing speeds.

Keep the files clean. Do not file when the teeth are clogged. Loaded files cause bumpy filing and scratch the work. Use a file card. Release the tension on the file band when it is not in use.

Excessive filing pressures, when the file segments are clogged with chips, will cause the file teeth to strip out, damaging the band.

## WELDING THE SAW

There are twelve different sized band saws supplied with the machine. These are all 106" long (135" on "MD" METAL-MASTER) and are not joined. For welding the ends of the saw, either in joining the saw for internal work or in repairing a broken band, it is necessary to first square the ends of the saw blade and see that they are flat. This can be done on the grinding wheel just below the welding unit.

If internal sawing is to be done, the blade is inserted thru the starting hole in the work, and the ends of the saw are now ready to be clamped into the terminals of the butt welder.

Insert the saw between the clamping blocks with the teeth against the ledge at the back of the terminals. This ledge lines up the saw, so that it will be in a straight line after welding. The recess in the jaw protects the teeth when clamped into position. The ends of the saw should meet at the center of the welding gap without any offset either in thickness or across the width.

The type "M" butt welder is a resistance welder in which the period of heating is automatically controlled by a mercury switch which breaks the contact when the saw is melted to a flowing temperature. This cut-off is governed by the movement of the left terminal which is under a set tension. The tension on this terminal holds the saw ends together during the heating stage only, and releases

when the switch is released. The time of welding is automatically controlled by the resistance of the saw being welded. Thus a wide saw requiring more heat to weld offers greater resistance and will come up to a welding heat in approximately the same time as the narrower saw requiring less heat. At this point, the free terminal will move in sufficiently to break the circuit. The ends of the saw must be clamped in the welder terminals so that the joint is flat, and so that one end is not off-set from the other, as shown on the drawing on the following page. If the ends are clamped in an off-set manner, an overlapping weld which will not hold, will result. After the saw ends are lined up and clamped securely between the welder terminals, the selector switch which controls the amount of heat, should be set to the correct position for the width of the saw being welded as follows:

Position (1) for saws  $1/8$ " wide or less

Position (2) for  $3/16$ " saws

Position (3) for  $1/4$ " and  $5/16$ " saws

Position (4) for  $3/8$ " saws

Due to variations in line voltages these settings may not give satisfactory results, in which case the operator should use the heat which will produce a weld that is complete but not burned. Since the spring tension on the jaws releases when the switch is released, it is important that the switch lever be held down until the weld is automatically made and has cooled below a red heat. It can then be released and the saw is ready to be annealed.

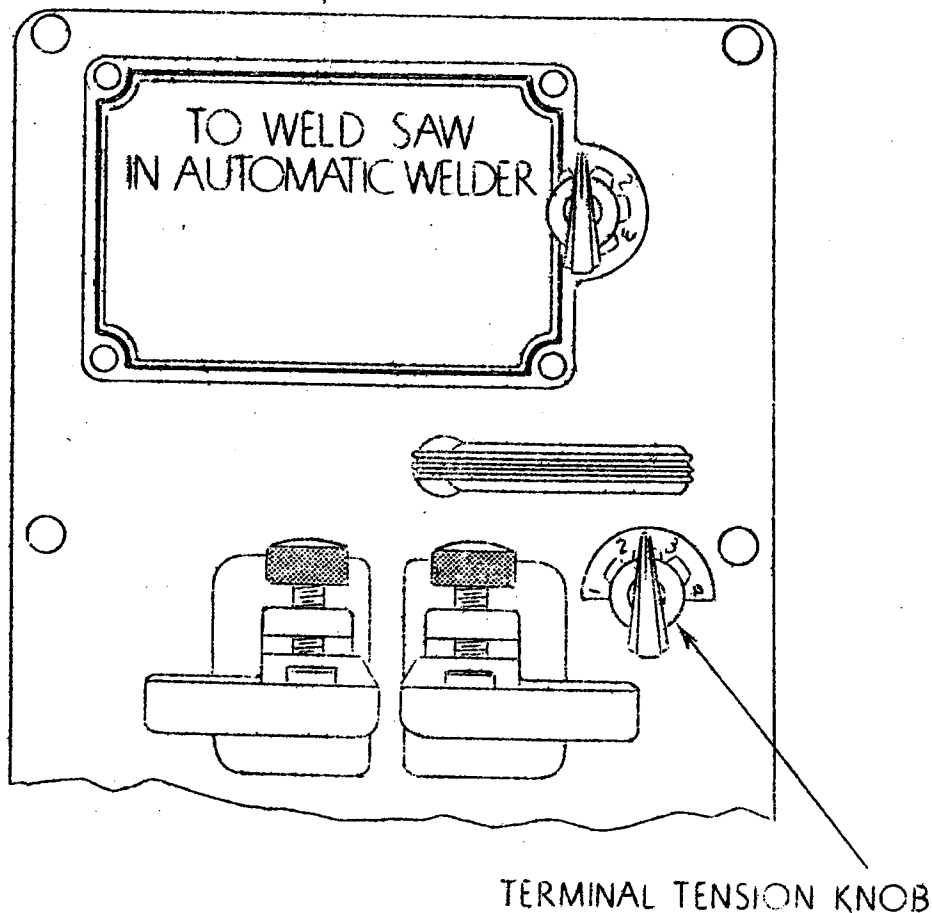


## TERMINAL TENSION

Directly below the welding switch lever is located the pointer knob which regulates the tension on the saw during the welding operation.

The correct tension is determined by the width of saw being welded. Narrow saws  $1/8$ " or less in width, require a minimum of tension, and for these widths the pointer should be placed at Position (1). Saws  $3/16$ " and  $1/4$ " wide require the tension at Position (2) or (3), and for  $3/8$ " saws, set the tension knob at Position (4).

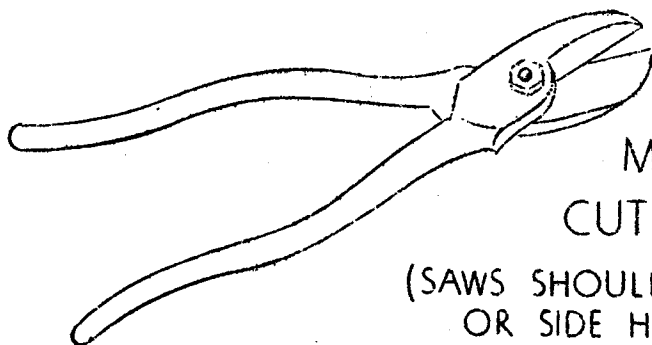
In general, the tension should be set at about the same position as the Heat Selector Switch. However, due to voltage variations, this may not be correct, in which case the tension should be set as given above regardless of the position of the Heat Selector Switch.



Band saw steel is air hardening, and hence it is necessary to anneal the weld to prevent it from being too brittle. Unclamp the saw from the welding terminals, move it forward to the wide gap position at the front of the welding terminals, and reclamp. Set the selector switch to position (1) and momentarily press the welding switch until the saw comes up to a dull cherry red color. It is important that the weld be annealed properly or it will be too brittle to flex over the 14" wheels. If the weld is not brought up to a dull cherry red, it will still be too hard to function properly. If the weld is allowed to get beyond a cherry red color, it will reharden, causing the joint to be brittle. After the weld is annealed, remove it from the terminals and grind off the flash from the weld on the small grinding wheel directly below the welding terminals. It is important that the welded joint in the saw be no thicker than the rest of the saw. The thickness of the weld should be tested in the gauging slot located on the front of the grinding wheel guard, before placing the saw in the saw guides. Make sure that the teeth of the saw are in line when making the weld. If they are not, the blade will not saw smoothly. Do not weld the saw in the same place twice. Since the welding operation uses up no more than 1/8" of the blade, the band will not shorten appreciably even after several welds have been made. It is often found after making a weld that the teeth of the band point in the wrong direction. The saw can be

reversed by turning the band inside out.

The entire welding operation should require no more than one minute to complete.

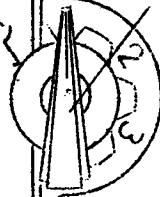


A CLEAN CUTTING  
METAL SHEAR FOR  
CUTTING BAND SAWS.

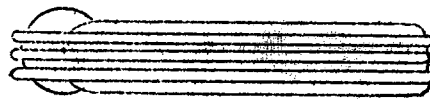
(SAWS SHOULD BE CUT FROM THE BACK  
OR SIDE HAVING NO TEETH)

# TO WELD SAW IN AUTOMATIC BUTT WELDER

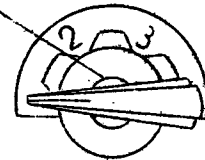
HEAT SELECTOR  
SWITCH



WELDING & ANNEALING SWITCH LEVER



TERMINAL TENSION KNOB

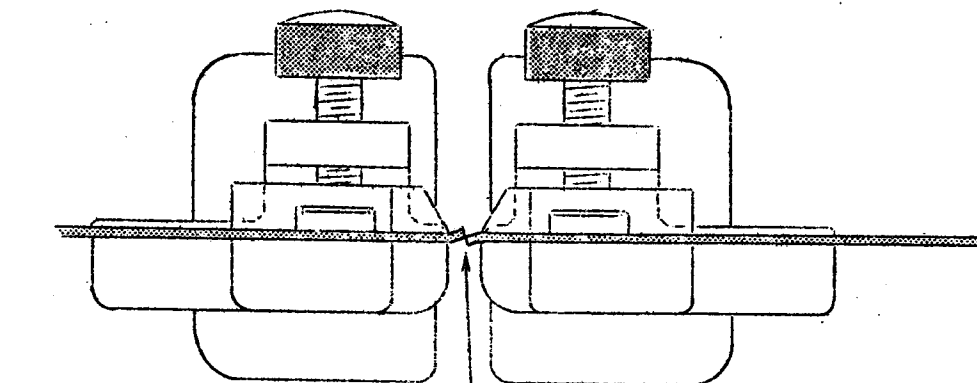


SAW CLAMP  
TERMINALS

SAW BAND  
BACKUP LEDGE

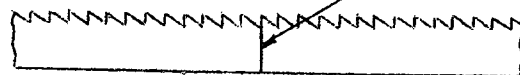
SAW BAND

CORRECT SAW ALIGNMENT



INCORRECT SAW ALIGNMENT.

GRIND SAW ENDS SQUARE  
BEFORE WELDING



BACK OF SAW MUST BE STRAIGHT

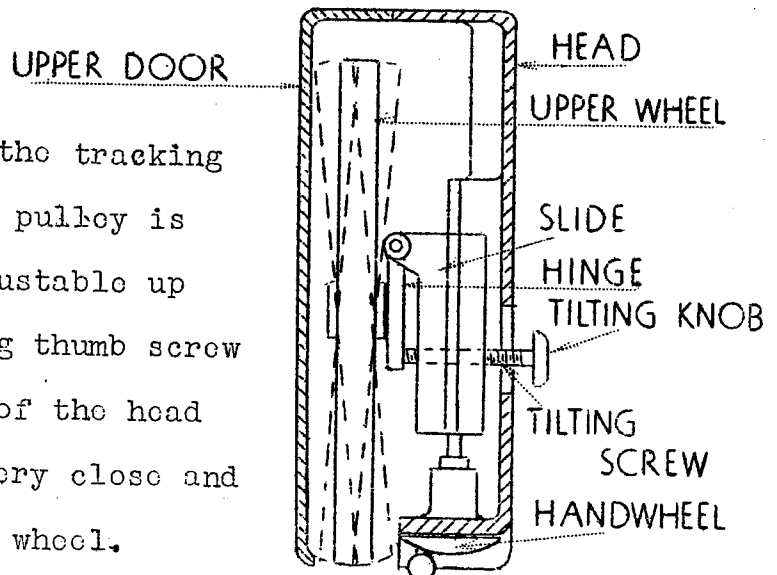
The most important adjustment to insure proper cutting with the DO-ALL lies in the setting or tracking of the blade so that it runs on the wheels in correct relation to the saw guide.

### SAW WHEELS

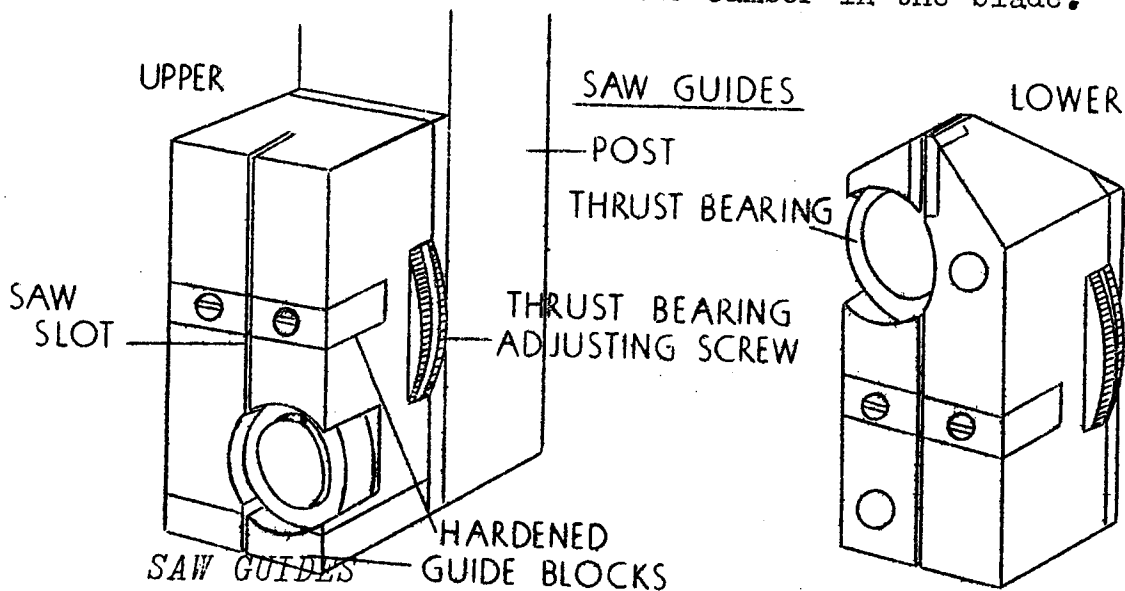
The METALMASTER wheels are accurately balanced and centered and are arranged with a crown face; that is, the center of the rim of the wheel is higher than the outside edges. This construction causes the endless band to travel near the center of the wheel face. The wheel covers are made from tough rubber impregnated on a fabric back. These tires eliminate wear on the saw teeth, and if care is exercised in tightening the saw blade, they will last for a considerable time. When the tires become worn or uneven, it is best to replace them with new tires. This is done by lifting the rubber tire with a screw driver or other flat tool and stretching the band until it can be taken off. These tires are held on by rubber cement, but are easily removed and replaced.

### TRACKING THE BAND

To facilitate changing the tracking of the blade, the upper pulley is tiltable as well as adjustable up and down. The adjusting thumb screw at the right hand side of the head of the machine allows very close and accurate tilting of the wheel.



Be sure to track the blade so that it travels in the center of the two pulleys when running free of the saw guides. If the saw band tracks unevenly, it is due to a twist or side camber in the blade.



To give a positive guide to the saw above and below the table, the METALMASTER uses unique saw guides consisting of two extremely hard guide blocks that support the blade on either side, and a hardened thrust bearing which is instantly adjustable to bring the saw to its proper depth between the guide blocks. The upper guide is secured with the same thumb screws and in the same manner as the file guide. The lower guide is fastened very close to the under surface of the table to give rigid support to the saw at the point of work. Two thumb screws hold the lower saw guide in position. Keep the guides adjusted and the thrust

bearings running free at all times.

Oil the felt liners from the top of the guide occasionally, enough to give a thin film of oil on the saw blade.

### ADJUSTING THE BLADE

After the band is placed on the wheels and inserted in the saw guides, in which the thrust wheels have been set at the bottom position, the machine should be started and upper pulley adjusted until the saw runs in the guides with the teeth entirely clearing the outside of the saw guide blocks. In no case should the band run so far in the slot that a clicking noise is heard as the teeth pass the guide blocks; nor should the band ever run so far out from the guide blocks as to allow it to twist while cutting. After the band is running with just the teeth projecting from the saw guide surface, the thrust wheels may be adjusted. These are moved forward until they just barely reach the back edge of the saw blade but do not touch. While the blade is running free it should not touch the thrust wheels or cause them to turn. The thrust wheels should come into play only under pressure of cutting, and at all other times the blade should run free. The upper saw guide should be lowered as close to the work as possible.

### TENSION OF THE BLADE

There is no hard and fast rule by which the correct blade tension can be obtained. In general, tighten new band saws just enough to do the work without twisting or

wavering in the kerf. After they have been used a little, they will have stretched slightly. Then re-adjust the tension to take up this slack. Blades 1/8" or less require less tension than 1/4" or 3/8" blades. This is due to the fact that narrow blades have less metal in them and require less tension to hold them in line while cutting is being done. Too strong tension, which is unnecessary, will wear the rubber wheel covers excessively. Correct tension on the saw blade can only be applied thru experience on the part of the operator. It is better to err on the side of too little tension than too much, since heavy tension is detrimental to the bearings, the saw band, and the wheel covers.

<u>WIDTH OF BLADE</u>	<u>APPROXIMATE TENSION</u>
1/16"	UP TO 15 LBS.
3/32"	15 LBS.
1/8"	20 LBS.
3/16"	30 LBS.
1/4"	55 LBS.
3/8"	60 LBS.

The METALMASTER table is mounted on a double trunnion providing adjustment forward or backward and to either side. The backward tilt is 10 degrees maximum; the forward tilt is 45 degrees; the lateral tilt is 10 degrees either side of the center. The angle of tilt is measured with a separate steel protractor, and instruct-



ions for its use are clearly shown on the next page. A T handled socket wrench is supplied for locking the table trunnion at the desired angle. Inasmuch as the regular run of work is done with the table at right angles to the saw, a zero line is placed on the left hand side of the trunnion rocker, at which point the table is exactly 90 degrees with the saw or file.

To divert the chips and filings into the waste chute, a baffle is attached to the lower wheel door. The baffle is removed to allow the table to be tilted forward more than 10 degrees.

#### SELECTION OF THE SAW \*

This is most important for proper operation. In general, band saws are tempered as follows:

A - TEETH VERY HARD for cutting - High chrome-high carbon steels

CONSULT THE JOB SELECTOR DIAL ON THE INSIDE OF THE UPPER WHEEL DOOR FOR COMPLETE SAW SELECTION INFORMATION.

Other alloy steels of high carbon content

High speed steels

Stainless steels

Hard steels

B - TEETH MEDIUM HARD for cutting - Tool steels-oil water, and air hardening

C - TEETH SOFT for cutting Brass, copper, plastics and non-metals

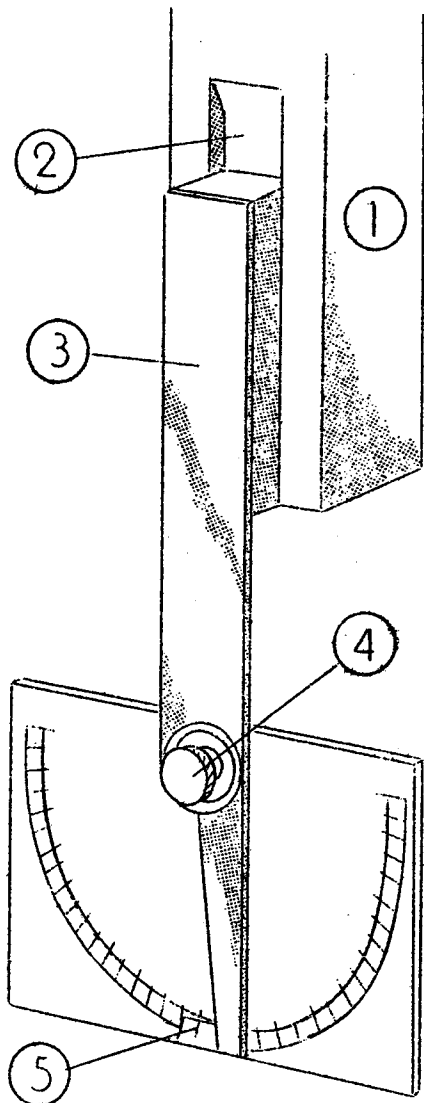
(\*NOTE - 14 pitch, B temper, heavy set, raker tooth, band saws are standard for general purpose tool room cutting).

# DIRECTIONS FOR USING DOALL TABLE ANGLE INDICATOR

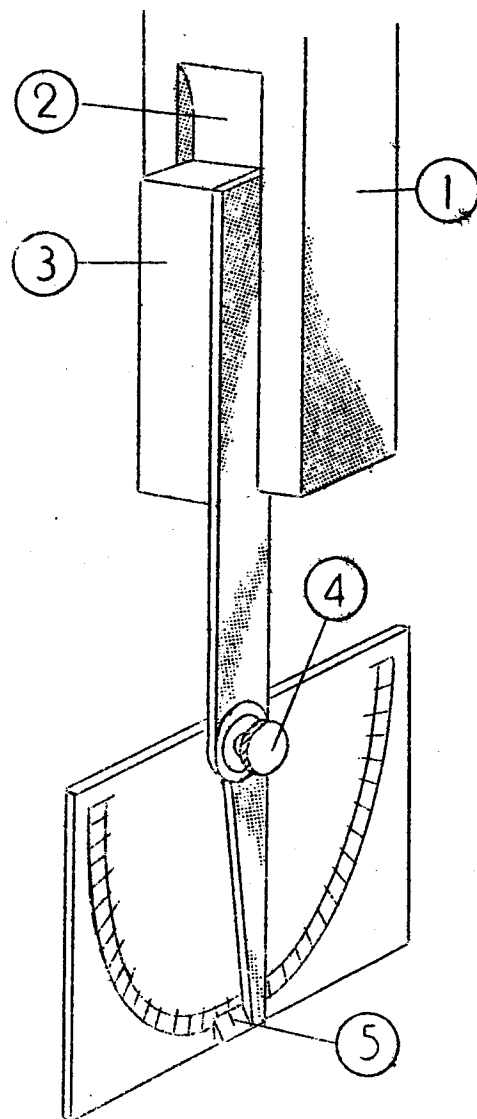
1. Adjust the post (1) to about 4 inches from the table surface.
2. Hold the square bar (3) of the indicator in the slot (2) on the post with the protractor resting on the table.
3. Tilt the table to the desired angle.
4. Lock the protractor with nut. (4)
5. Take exact angle reading at (5)

The protractor bar is ground square and can be placed in the post slot to take either forward and back tilt or lateral tilt readings.

Protractor in place for taking lateral tilt readings



Protractor in place for taking forward or back tilt readings



*BANDSAW MANUFACTURERS*

Henry Disston & Sons, Inc.....Philadelphia, Pa.  
Forsberg Mfg. Co.....Bridgeport, Conn.  
The Henry G. Thompson & Son Co.....New Haven, Conn.  
American Saw & Mfg. Co.....Springfield, Mass.  
Simonds Saws & Steel Co.....Chicago, Ill.

Correct saws for use on the METALMASTER can be purchased direct from our factory stock at very low prices. Over 200,000 feet of every size and type is carried in stock at all times. See price list

STANDARD WIDTH OF BLADES ARE: 1/16" - 3/32" - 1/8" - 3/16" - 1/4" - 3/8".

THE WIDTH OF BLADE TO USE IS DETERMINED BY:

1. THE FEED - Always use the widest blade possible. Heavy feeding demands the use of a wide saw. The choice then is limited by -

2. THE CURVATURE TO BE CUT - Use this guide in selecting the proper width.

WIDTH OF BAND SAW

MINIMUM RADII CUT  
( With Heavy Set Saws )

1/16"

3/32"

3/32"

1/8"

1/8"

1/4"

3/16"

7/16"

1/4"

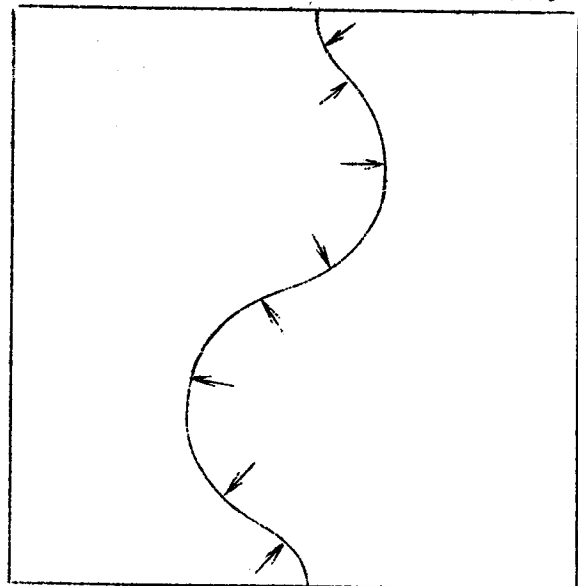
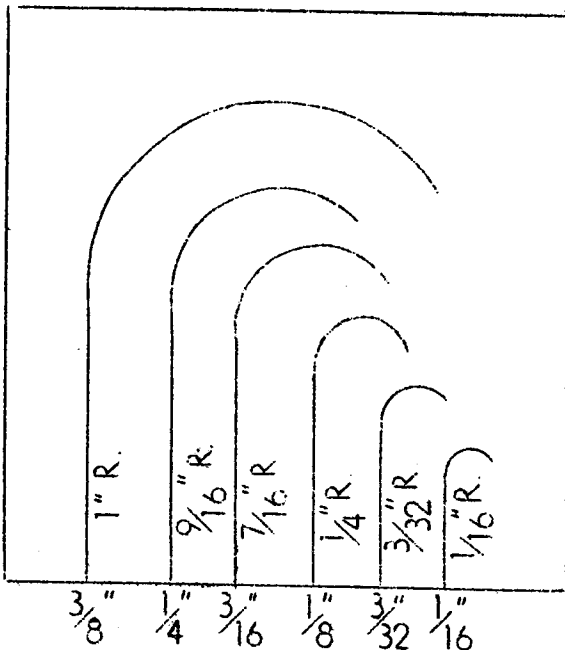
9/16"

3/8"

1"

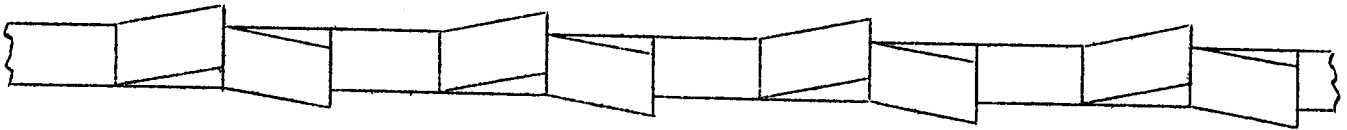
BY CAREFUL HANDLING THESE SAWS WILL CUT CONSIDERABLY SMALLER RADII THAN SHOWN.

IN CUTTING CURVES PRESSURE SHOULD BE EXTENDED INTO THE RADIUS AS SHOWN BELOW.



THERE ARE THREE DISTINCT TYPES OF TOOTH CONSTRUCTION:

1. RAKER TOOTH



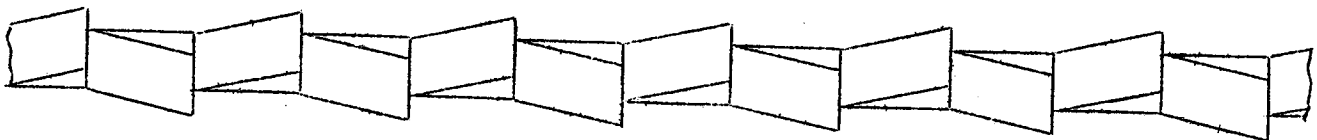
One straight tooth alternates with two teeth set in opposite directions. The straight tooth clears the kerf of chips. This tooth construction is used exclusively for cutting all iron or steel except sheets, tubing or angles. The saws supplied with the DO-ALL all have raker teeth.

2. WAVE TOOTH



For cutting sheets, tubing, etc.

3. STRAIGHT TOOTH (Alternate set on each tooth)



For brass, copper, plastics and non-metals.

THE GAUGE OF THE SAW IS .025".

THERE ARE TWO SIZES OF SET:

1. STANDARD SET .033" width of teeth.

(approximately .004" set on a side)

This width of set is only for large, heavy work, in which not many curves are to be cut. There is a minimum of vibration when the standard set saw is used on heavy work. It is available in 1/4" and 3/8" wide saws.

2. HEAVY SET .040" width of teeth.

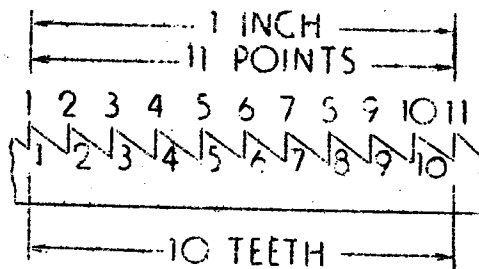
(approximately .007" set on a side)

This is the most commonly used. The wider kerf it cuts allows greater freedom for the tail of the saw, enabling smaller radii to be cut.

PITCH OF TEETH:

Band saws are cut in 6-8-10-12-14-18-22-24-32 pitch, or teeth per inch.

They are measured thus -



PITCH

MATERIAL TO BE CUT

8  
10

Large, solid sections over 2" thick  
Soft metals

12

Medium solid sections, 1/2" to 2" thick  
Hard steels

14

Heavy gauge structurals  
Heavy gauge sheets  
General purpose cutting

PITCH	MATERIAL TO BE CUT
18	Light sections, 1/16" to 1/2" Light structurals Medium gauge sheets and tubing
22	Very light sections
24	Very light structurals Thin gauge sheets and tubing
32	Very thin sheets and tubing Off shape pieces

#### IN GENERAL:

The coarser pitches are used on soft or thick materials at slow speed.

The finer pitches are used on hard or thin materials at higher speeds.

THESE MANY FACTORS MAKE PROPER SELECTION OF THE BAND SAW IMPORTANT. THE JOB SELECTOR DIAL ON THE MACHINE WILL SERVE TO GUIDE YOU IN THIS SELECTION. EXPERIENCE WITH THE DO-ALL ON VARIOUS MATERIALS WILL SHOW THE CORRECT BLADE TO USE.

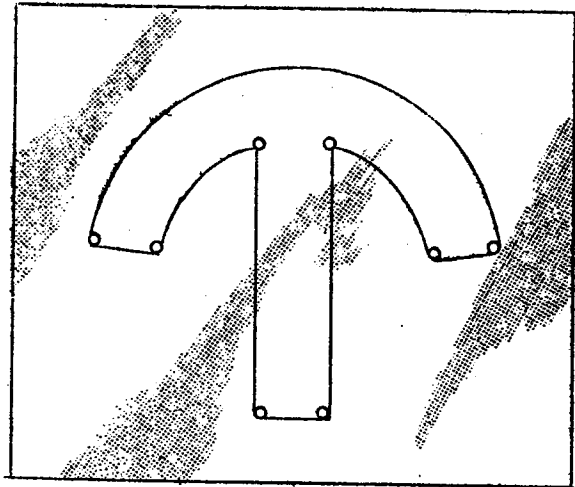
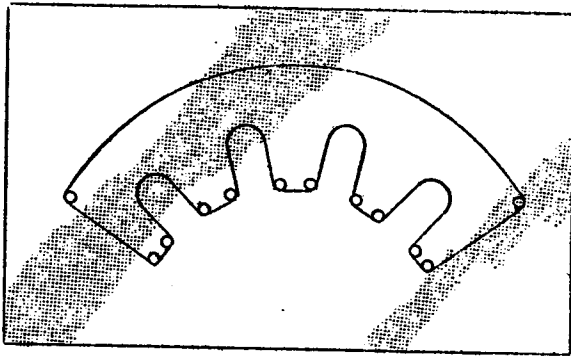
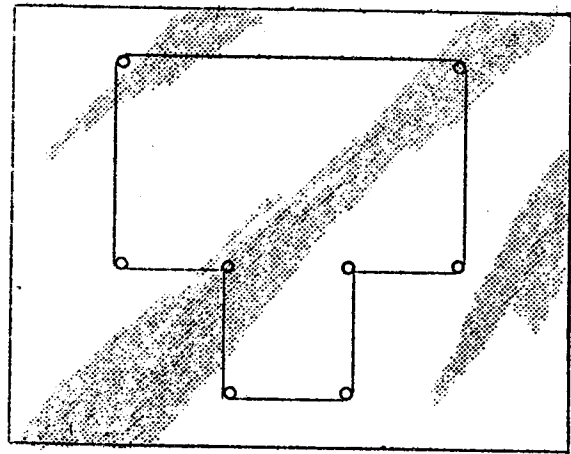
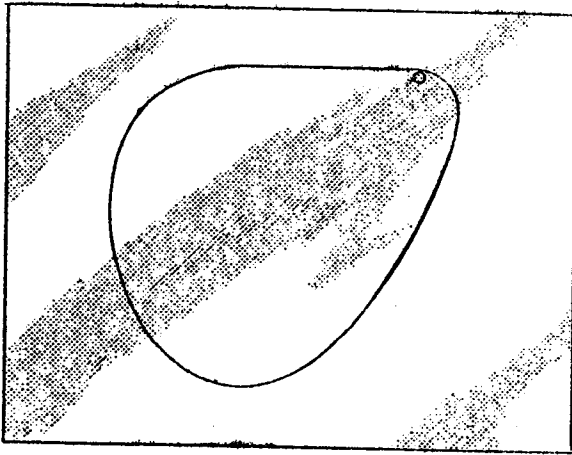
#### GENERAL OPERATION IN SAWING

The DO-ALL is very simple to operate, but to make the saw follow to within a few thousandths of an inch from the line requires some experience. We recommend that the operator practice on sample blocks of steel before attempting to do actual work on the machine. Hand feeding is best for small dies, templates and light work, and also on cutting all small curves.

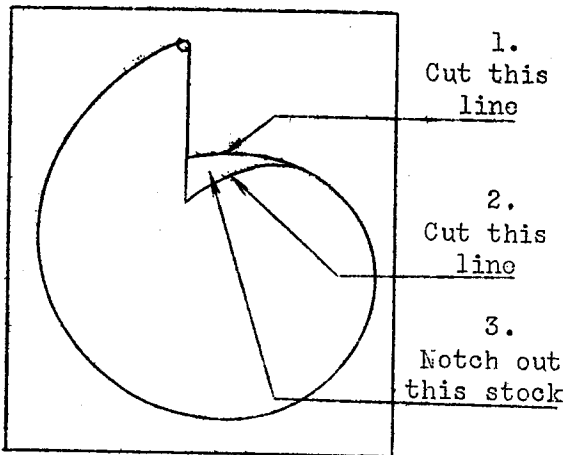
#### SCREW FEED

For sawing large sections where manual feeding of the work

EXAMPLES OF HOLE LAYOUTS FOR INTERNAL SAWING



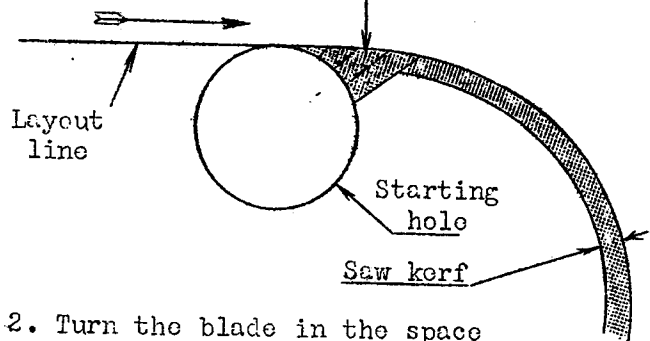
URNS CAN BE NAVIGATED WITHOUT DRILLING BY NOTCHING A SPACE WITH THE SAW.



4. Turn the blade in the space notched out and cut in the next direction.

TO FOLLOW THE LINE DIRECTLY FROM THE HOLE -

1. Notch out the stock between the hole and the line.



2. Turn the blade in the space notched out, and cut in the direction indicated by the arrow.

The diameter of the drilled holes is determined by the size of the saw. Use the widest saw possible, consistent with the curves to be cut and the size of the piece.



is likely to be tiring, the screw feed should be used. This feed is an acme threaded, 1/2" screw, the point of which is hardened. The screw swivels in its housing so that curves can readily be navigated. The tee block which contains the swivel is mounted by placing it between the two brackets on either side of the table slot. No further means is required to hold the screw assembly in place.

The screw can readily be adjusted from one position to another, by lifting the key out of the slot in the swivel and sliding the screw to position. The key is then dropped into place.

A work holding jaw to hold the work block when using the screw feed facilitates in keeping the work in correct alignment with the saw.

### POWER FEED

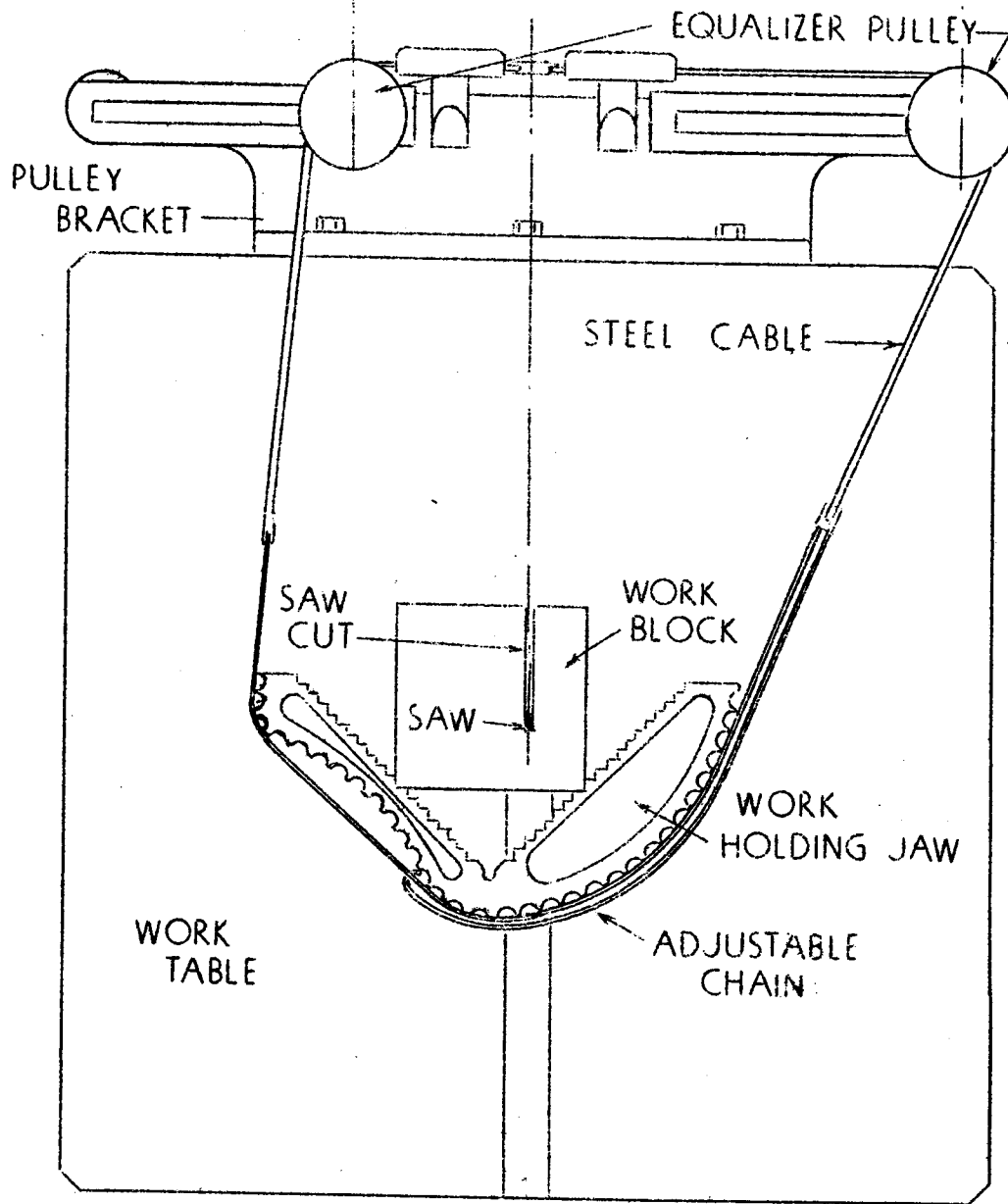
The METALMASTER automatic feed allows the operator to use both hands in guiding the work without exerting any sawing pressure manually. This feed is actuated by a gravity fed weight carried along a beam on roller bearings. The position of this weight along the beam simultaneously determines the rate of feed and the pressure at the point of sawing. By turning the small handwheel on the side of the base, the position of the weight is varied. In turning the handwheel clockwise, it reduces the pressure and rate of feed, while counter clockwise increases the

pressure and rate of feed. At the maximum rate of feed, or when the handwheel is in the farthest counter clockwise position, the weight exerts a pressure or pull of 60 pounds.

This setting should be used only for sawing at high speeds on wood and other fast cutting materials, and only when using saws 1/4" or wider. For all regular work on steel and non-ferrous metals, a pressure of from 35 to 45 pounds should be used. When using the power feed with saws 1/8" wide or less, the pressure should be reduced to a minimum. Straight line cutting allows a greater speed to be used than in cutting curves. Adjust the feed to give maximum cutting speed for each particular job without overstraining the saw blade.

The foot pedal at the bottom of the left hand side of the base is used to release the pressure and stop the feed without the operator removing his hand from the work block. When a cutting speed less than the minimum allowed by the weight, is required, it can be controlled by putting pressure on the foot lever to the required amount. This can be regulated from 0 up to 25 pounds pressure. On large work where the length of cut exceeds the distance of the maximum feed, (10") the weight is brought back into starting position by pressing the foot lever down; securing it in the notch at the bottom of the foot pedal slot, and taking up the slack in the work holding chain.

SETUP FOR POWER FEED CABLE



## LUBRICATION

The DO-ALL is completely equipped with sealed SKF bearings which are thoroughly lubricated at the factory, and will require no further lubrication except for the three parts listed below:

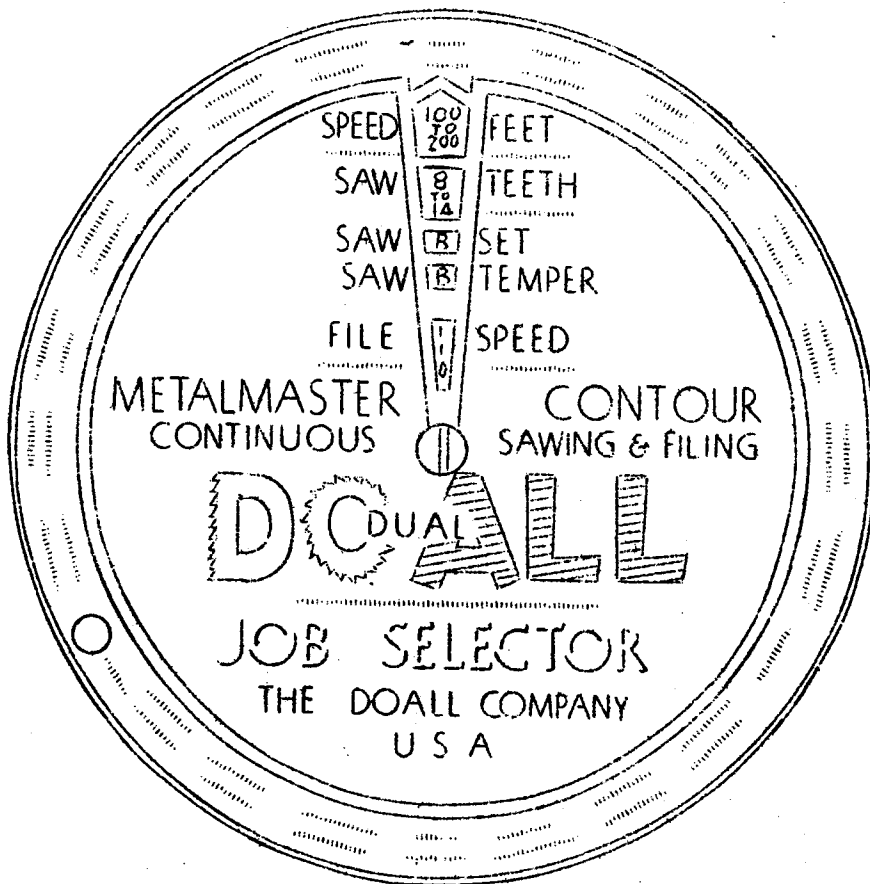
(1) Variable speed pulleys which are mounted on the pivoted rocker arm in the base. For these bearings, use a good grade of spindle oil to about 100 seconds saybolt viscosity at 100° Fahrenheit. Do not over oil the pulleys, as the excess will coat the belts causing slippage.

(2) The drive motor has wool packed sleeve bearings, and should be oiled at least twice a year.

(3) Oil the thrust bearings and adjusting rack to keep them working freely at all times. The thrust bearings are completely sealed and are oiled thru a hole extending thru the adjusting rack.

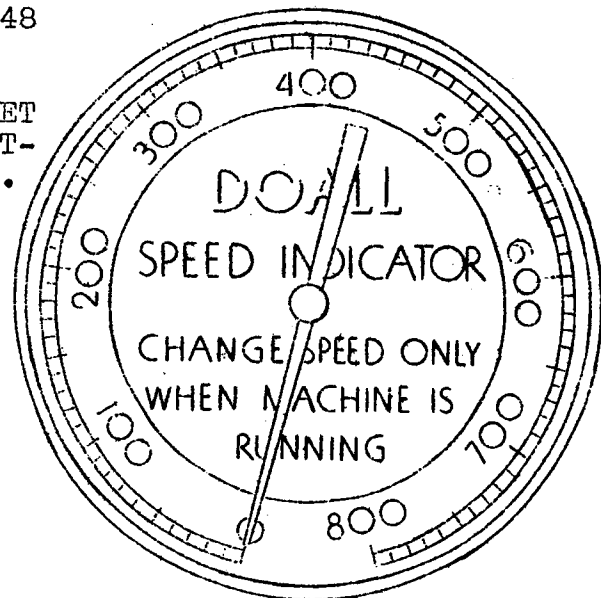
## OPERATING SPEEDS

The METALMASTER DO-ALL has a speed range of 48' per minute to 800' per minute (band saw travel). Change the speed with the handwheel at the rear of the machine. Watch the dial speed indicator until it is at the correct operating speed. Do not exceed 160' per minute when a file band is on the machine. With a band saw on the



THIS DIAL MOUNTED ON THE UPPER DOOR OF THE MACHINE GIVES COMPLETE SAWING AND FILING INFORMATION FOR 48 DIFFERENT MATERIALS.

THE SPEED INDICATOR SHOULD BE SET AT THE SPEED GIVEN ON THE SELECTOR DIAL FOR EACH PARTICULAR JOB.



machine, most metal cutting operations will be between 50' and 200' per minute. Consult the JOB SELECTOR DIAL on the inside of the upper door of the machine - proper cutting speeds are important in conserving the band saw. Using incorrect speeds tends to burn up the band saw and slows down the cutting. If the correct speed is maintained, the saw will cut fast and do clean work. The pressure exerted on the work depends on the condition of the saw, the stock thickness, and the skill of the operator. The stock can be fed as fast as the saw will cut without putting undue pressure on the saw and saw guides.

The drive mechanism of the METALMASTER consists of a 3/4 H.P. repulsion-induction motor of the required current characteristics, cushioned in rubber and mounted on the inside wall of the base. This motor drives a patented variable speed transmission having no gears, and operated by means of "V" belts, giving an infinite speed range of 16 to 1. The variable transmission consists primarily of two interlocking double groove pulley units mounted laterally on a pivoting rocker arm. These two pulley units are connected with a counter "V" belt. Center distances between the drive pulley on the motor and variable pulley, as well as the driven pulley of the machine and the variable pulley, can be changed. The center distance between the two variable pulleys themselves is constant. By varying the center distances of the variable pulleys, in relation to the drive and driven pulleys, the

belts assume smaller or larger operating pitch diameters on the "V" pulleys, giving the 16 to 1 ratio. Belt alignment is taken care of by having the pulley units floating on their respective shafts. Belt stretch is readily taken up by raising the motor higher on the side wall. This adjustment automatically takes up the slack in all the three belts. The variable unit is mounted to a cross bar in the base and is easily removed by taking out the four holding screws in the base cross member.

To reduce the speed further for the drive saw wheel, a gear reduction unit is mounted from the top of the base. This reducer uses non metallic, silent, helical cut gears running on ground shafts which are carried in SKF bearings. The unit is completely lubricated and sealed at the factory and requires no further lubrication.

### DISC CUTTING ATTACHMENT

When cutting true circles up to 54" in diameter (faster than turning in a lathe), inside or outside sawing can be quickly and accurately accomplished with this attachment. The pivot hole bar is attached to the table by means of a slotted angle bracket on the front skirt of the table. Two lock screws secure the bar in position on the table. A series of tapped holes 1" apart, extend through the center of the bar, and are for securing the center pins on which the work rotates. When in position, these holes should be in a line at right angles to the saw and extend from the saw blade to the front of the table.

The plate can be adjusted on the table to give any distance from the saw to the center pivoting hole, thereby allowing any diameter circle to be cut. Three pins are provided on which the work pivots.

*CENTERING DRILL PIN* (for cutting discs thru which the center hole must not extend. Use a No. 30/30 centering drill for this pin).

*PIN FOR LIGHT WORK* (size of pin 1/8" x 1 1/2")

*PIN FOR HEAVY WORK* (size of pin 1/4" x 3").

For cutting washers, the outside cut is made first. The inside cut is then made by welding the saw thru a hole drilled on the inner diameter line.

This attachment can also be used for filing.

### MAGNIFYING ATTACHMENT

This attachment consists of a 3" diameter lens mounted in a flanged cast aluminum housing. The housing contains a light socket for a 7 watt candelabra type lamp. The lens and light are supported on a flexible arm secured to a base sufficiently heavy to support the light. The attachment is placed on the table without clamping, and can be moved freely about. The light wire is 18" long and is fitted with a miniature prong type plug. This plug connects with the outlet cap located on the front of the machine, to the right of the post clamping lever. The lamp has no switch and is "on" when plugged in to the outlet.



BAND POLISHING ATTACHMENT

This simple attachment permits excellent polishing and finishing, and makes your machine three-in-one instead of two-in-one. The unit is set up in less than a minute, in the same manner as the file band. Change from one band to another can be made in only a few seconds. Emery cloth bands are available in the following sizes and grits:

EMERY CLOTH BANDS (1" WIDE X 106" LONG)

APPLICATION	CUTTING SPEEDS	GRIT
GRINDING	500	150
POLISHING COARSE	700	80
POLISHING FINE	800	50

ALOXITE GRADE - GENERAL PURPOSE STEEL, ETC.

CORUNDUM GRADE - FOR BRASS, COPPER, BRONZE, AND OTHER TOUGH METALS.

## GENERAL SPECIFICATIONS

Weight - 1200 lbs.

Height - 70"

Floor space required - 22" x 28"

Throat Depth - 14"

Maximum work thickness 8" standard - up to 14" to order

Pulley Diameter - 14"

Saw Length - 106" maximum

File Length - 106"

Table Size - 20" x 20" Ribbed Construction

Distance from floor to table - 44"

Table Tilt - 45° Forward - 10° Back - 10° to either side

Bearings - Sealed SKF thruout, except Oilite Bearings in  
Variable Speed Transmission

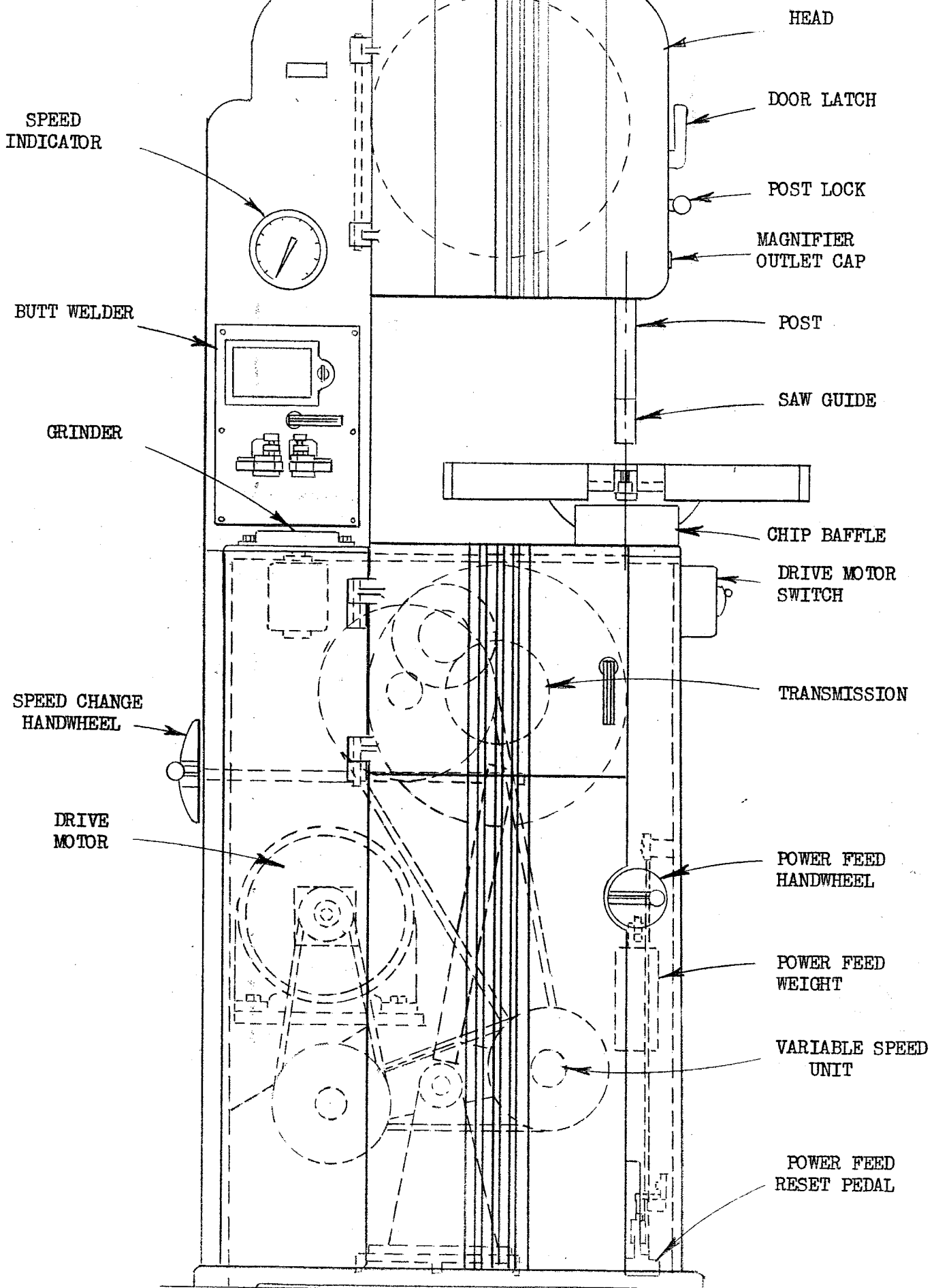
Gear Transmission - 8 to 1 ratio by helical silent gears

Motor - 3/4 H.P. Repulsion-Induction type

Speed Indicator - Cable driven tachometer type

Butt Wolder - Primary current 220 volts AC - 60 cycle -  
Resistance type with automatic cutoff

48 - 800 RPM Speed





*BUTT WELDER  
SPECIFICATIONS*

Voltage - Primary, 220 AC

Secondary Tap 1 - 1.37 volts  
Tap 2 - 1.31 volts  
Tap 3 - 1.25 volts  
Tap 4 - 1.20 volts

Watt Consumption - 600 watts at tap 4

Figures derived from tests with a 3/8" wide band saw.

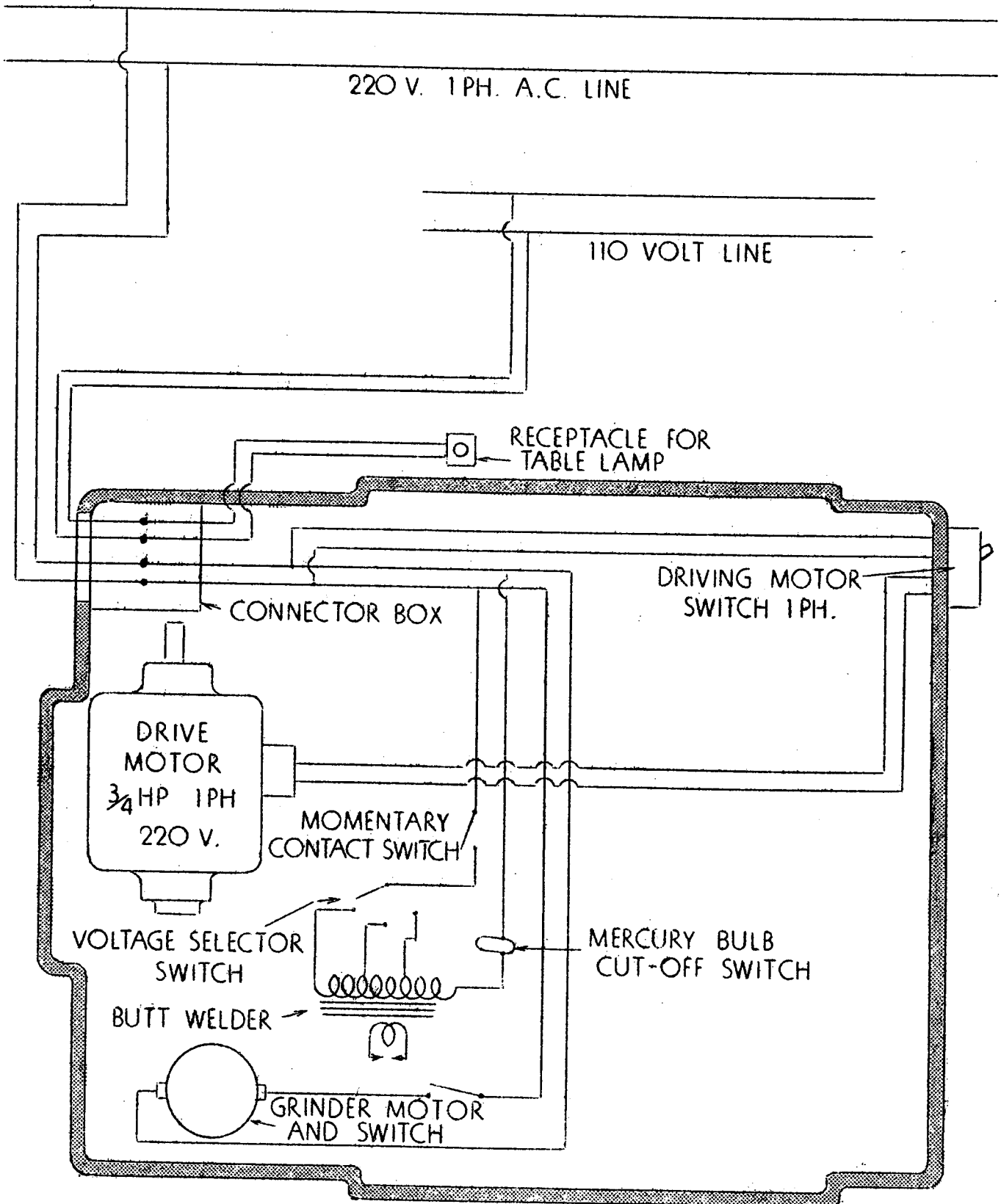
The welder operates only on 220 volt, 60 cycle, alternating current.

Higher voltages can be stepped down to the correct voltage with a transformer.

Current Consumption - About 1200 welds per one Kilowatt hour.

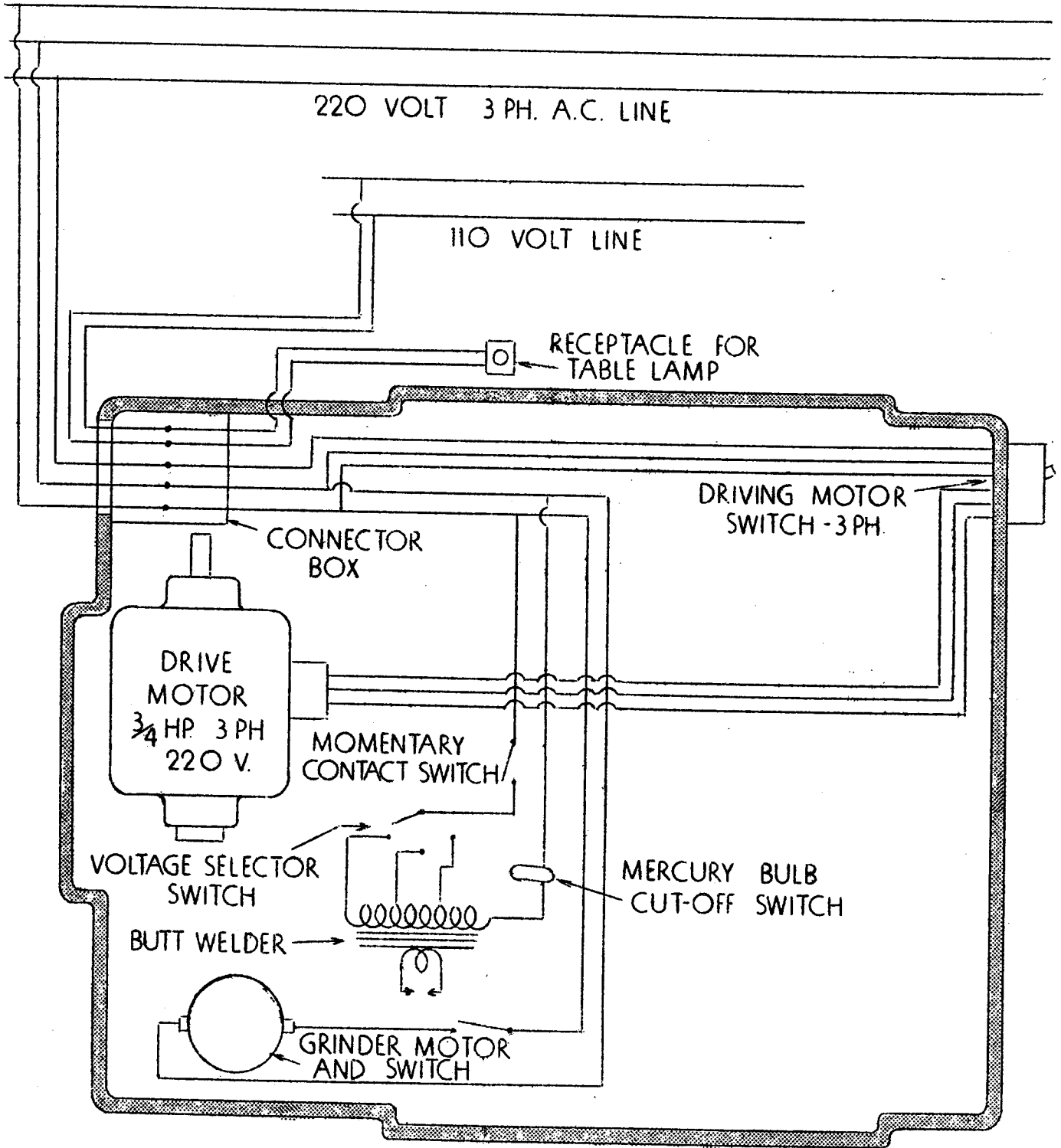
Brazer Grinding Wheel - Diameter - 3"  
Thickness - 1/2"  
Hardness - K  
Grit - 40  
Speed - 2000 RPM

DOALL  
WIRING DIAGRAM - TYPE "M"  
220 V. 1 PHASE 60 CYC. A.C.



# DOALL WIRING DIAGRAM - TYPE "M"

220 V. 3 PHASE 60 CYC. A.C.







REPLACEMENT PARTS MANUAL FOR MODELS M AND MD

<u>PART NUMBER</u>	<u>PART NAME</u>	<u>ASSEMBLY USED IN</u>	<u>MODEL OF MACHINE</u>
34-01104	Upper Door Handle	Head	M & MD
34-01105	Upper Door Latch	Head	M & MD
34-01110	Upper Saw Wheel Slide Screw Hand Handwheel	Head	M & MD (Sub. 5-01106-Reworked)
34-01201	Upper Saw Wheel	Head	M & MD
4-01308	Third Saw Wheel	Head	MD (Supply 12-01201)
34-01306	Upper Door Latch Spring	Head	M & MD
34-01309	Aux. Door Latch Spring	Head	M & MD
34-01402	Post Lock Lever	Head	M & MD (Supply 5-01247)
34-01405	Upper Saw Wheel Slide Screw Collar	Head	M & MD (Supply 34-05410)
34-01501	Handle	Head	M & MD
34-01502	Socket	Lamp	M & MD (Sub. 19513-B)
34-01503	Rubber Cement for Attaching Tires	Head	M & MD
34-01505	Wheel Rubber Tire	Head	M & MD (M & MD have two (2) 14" Wheels)
34-01508	Reflector	Lamp	M & MD (Sub. 19513-C)
34-01510	Ball Joint	Lamp	M & MD
12-01507	Third Wheel Rubber Tire	Head	MD (MD has one 12" wheel)
6-01502	Flexible Arm	Lamp	M & MD
34-02502	Tool Box	Base	M & MD (Sub. 5-02313)
34-02513	Lower Wheel Brush(Less Bracket)	Trans.	M & MD (Sub. 34-02501)
34-03102	Trunnion	Tble. & Trun.	M & MD
34-03103	Secondary Trunnion	Trunnion	M & MD (Supply 3-03116)
34-03104	Trunnion Support	Tble. & Trun.	M & MD (Supply 5-03101)
34-03106	Screw Feed Handle	Sc. Feed	M & MD
34-03107	Work Holding Jaw	Tble. & Trun.	M & MD
34-03112	Filler Plate Handwheel	Tble. & Trun.	M & MD (Supply 34-03117)
34-03000	Screw Feed Assembly	Sc. Feed	M & MD (Discontinued - Furnish 5-03001)

<u>PART NUMBER</u>	<u>PART NAME</u>	<u>ASSEMBLY USED IN</u>	<u>MODEL OF MACHINE</u>
3-03301	M Table Filler Plate	Trunnion	M (1/4 x 1 x 10-7/8) Before June 15, 1938)
4-03301	MD Table Filler Plate	Trunnion	MD (1/4 x 1 x 12-5/8) Before August 1, 1938)
3-03309	Filler Plate (Saw)	Tble. & Trun.	M (After 6-15-38)
3-03310	Filler Plate (File)	Tble. & Trun.	M
4-03309	Filler Plate (Saw)	Tble. & Trun.	MD (After 8-1-38)
4-03310	Filler Plate (File)	Tble. & Trun.	MD (After 8-1-38)
34-03305	Trunnion Bearing Cap (2)	Trunnion	M & MD
34-03311	Screw Feed Swivel Key	Sc. Feed	M & MD (Discontinued - Furnish 5-03402)
34-03403	M & MD Feed Screw	Sc. Feed	M & MD
34-03404	Trunnion (1)	Trunnion	M & MD
34-03405	Trunnion Stud (2)	Trunnion	M & MD
34-03406	Trunnion Locking Washer (2)	Trunnion	M & MD
34-03407	Trunnion Axis Pin	Trunnion	M & MD
34-03413	Screw Feed Swivel	Sc. Feed	M & MD (Discontinued- Furnish 5-03401)
34-03414	Trunnion Washer	Tble. & Trun.	M & MD
34-03502	Trunnion Locking Wrench	Trunnion	M & MD
34-04201	Saw Drive Wheel	Trans.	M & MD
34-04301	Bearing Cap	Trans.	M & MD (Sub. 5-04303)
34-04302	Bearing Cap	Trans.	M & MD (Sub. 5-04303- Reworked)
34-04303	Bearing Cap	Trans.	M & MD (Sub. 5-04303- Reworked)
34-04401	Countershaft	Trans.	M & MD
34-04406	Input Pinion Shaft	Trans.	M & MD
34-04407	Output Gear Shaft	Trans.	M & MD
34-04501	Input and Countershaft Bearings SKF 6303	Trans.	M & MD
34-04502	Output Shaft Bearings SKF 6304	Trans.	M & MD
34-04503	Countershaft gear and Output Gear (6" O.D., 52 Teeth, 7/8" Bore, 7/8" Face)	Trans.	M & MD

PART NUMBER	PART NAME	ASSEMBLY USED IN	MODEL OF MACHINE
34-04504	Input Sheave for V-Belt) (11" Transmission Pulley - 9" for 25 cycle)	Trans.	M & MD
34-04506	Countershaft Pinion (3" O.D. 26 Teeth, 7/8" Face, 1" Bore)	Trans.	M & MD
34-04507	Input Pinion	Trans.	M & MD
34-05101	Variable Base	Variable	M & MD
34-05102	Variable Rocker Arm	Variable	M & MD
34-05103	Speed Change Handwheel	Variable	M & MD
34-05104	Handwheel Bearing	Variable	M & MD
34-05203	Stationary Sheave	Variable	M & MD (Sub. 6-05202)
34-05204	Floating Sheave	Variable	M & MD
34-05306	Speed Indicator Bezel	Variable	M & MD (Sub. 6-05402)
34-05401	Variable Pulley Shaft	Variable	M & MD
34-05409	Speed Change Screw	Variable	M & MD
34-05411	Speed Change Threaded Bushing	Variable	M & MD
34-05503	Motor to Variable	Variable	M & MD (Specify Length or Serial Number)
34-05508	Speed Indicator Flexible Shaft	Variable	M & MD
34-05513	Handle	Variable	M & MD
34-05517	Variable Shaft Bearings	Variable	M & MD
34-05524	Universal Joint	Variable	M & MD
34-06312	Saw Clamp - Right and Left Hand	Butt Welder	M & MD (Sub. 34-06323 & 4)
34-06412	Saw Clamp Thumbscrews	Butt Welder	M & MD
34-06503	Momentary Contact Switch	Butt Welder	M & MD
34-06504	Spring Clip	Butt Welder	M & MD
34-06505	Voltage Selector Switch	Butt Welder	M & MD
34-06511	Line Voltage Reg. Switch	Butt Welder	M & MD
34-06513	Snips	Butt Welder	M & MD
34-08001	Upper Saw Guide Complete	Saw Guide	M & MD (Not Available - Furnish 35-450)
34-08002	Lower Saw Guide Complete	Saw Guide	M & MD (Not Available - Furnish 34-08104)

<u>PART NUMBER</u>	<u>PART NAME</u>	<u>ASSEMBLY USED IN</u>	<u>MODEL OF MACHINE</u>
34-08309	Thrust Bearing Cap (2)	Saw Guide	M & MD
34-08401	Lower Saw Guide Mounting Screw	Saw Guide	M & MD (Sub. 35-1206)
34-08402	Upper Saw Guide Mounting Thumbsc.	Saw Guide	M & MD (Sub. 35-1603)
34-08405	Thrust Bearing Adjustment Thumbnut	Saw Guide	M & MD
34-08409	Thrust Bearing Adjustment Rack (2)	Saw Guide	M & MD
34-08501	Thrust Bearing with Cap (2)	Saw Guide	M & MD
34-09001	File Guide Backup Screw	File Guide	M & MD
34-09002	1/2" x 6-3/4" File Guide Complete	File Guide	M & MD
34-09003	3/8" x 8-5/8" File Guide Complete	File Guide	M & MD
34-09004	1/2" x 8-5/8" File Guide Complete	File Guide	M & MD
34-09005	1/4" x 12-1/2" File Guide Complete	File Guide	M & MD
34-09006	3/8" x 12-1/2" File Guide Complete	File Guide	M & MD
34-09007	1/2" x 12-1/2" File Guide Complete	File Guide	M & MD
34-09312	File Guide Backup	File Guide	M & MD
34-10301	Band Polishing Guide Plate	Band Pol.	M & MD (Discontinued - Furnish 6-10001)
34-10302	Band Polishing Guide Bracket	Band Pol.	M & MD (Discontinued - Furnish 6-10001)
34-10504	Fabric Cover for Guide Plate	Band Pol.	M & MD
34-10505	Tube Graphite	Band Pol.	M & MD
34-11305	Diaphragm (4-hole previous to 9-28-38)	Air Pump	M & MD (Supply 12-11305)
34-11306	Diaphragm (1-hole after 9-28-38)	Air Pump	M & MD (Supply 12-11306)
34-11501	Air Pump (Diaphragm Type)	Air Pump	M & MD (Discontinued - Sub 5-11002)
34-11502	Air Hose (Rubber)	Air Pump	M & MD
34-11503	Air Tube Metal - M,MD - 36"	Air Pump	M & MD (Sub. 6-01502)
34-11508	Ball Bearing (#201 TT Fafnir)	Air Pump	M & MD
34-12502	Grinder Motor Switch	Grinder	M & MD (Supply 19505-A)
3-13101	Pulley Bracket	Power Feed	M
4-13101	Pulley Bracket	Power Feed	MD

<u>PART NUMBER</u>	<u>PART PART NAME</u>	<u>ASSEMBLY USED IN</u>	<u>MODEL OF MACHINE</u>
34-13102	Pulley Clevis	Power Feed	M & MD (Sub. 5-13106)
34-13106	Pulley Clamp Handwheel	Power Feed	M & MD
34-13108	Release Lever	Power Feed	M & MD
34-13111	Foot Pedal	Power Feed	M & MD
34-13301	Power Feed Pulley Cap	Power Feed	M & MD
34-13306	Pulley Cap Base	Power Feed	M & MD
34-13408	Cable Binder	Power Feed	M & MD
34-13409	Weight Shifting Screw	Power Feed	M & MD
34-13411	Weight Shifting Nut	Power Feed	M & MD
34-13416	Pivot	Power Feed	M & MD
34-13418	Thumbnut	Power Feed	M & MD
34-13502	Chain Cable 10'	Power Feed	M & MD
34-13504	Ball Bearing	Power Feed	M & MD
34-13508	Knob	Power Feed	M & MD
34-14001	Job Selector Dial	Head	M & MD (Not Available) Furnish Standard ML)
34-15000	Disc Cutter Assembly	Disc Cutter	M & MD (Furnish ML with Special Post Clamp)
34-16000	Rip Fence Assembly	Rip Fence	M & MD (Discontinued - Furnish ML
34-17101	Magnifier Base	Magnifier	M & MD
34-17501	Lens	Magnifier	M & MD (Rectangular)
19502-B	Motor	Variable	M & MD Price on Application (Specify voltage)
19504-E	Motor Switch	Base	M & MD
19512-A	Magnifier Lamp Bulb	Magnifier	M & MD
19513-A	Lamp Socket (Magnifier)	Magnifier	M & MD

