OPERATOR'S MANUAL

WORK SAFELY AT ALL TIMES WITH QUALIFIED OPERATORS ONLY.

MODEL # _____ **SERIAL #** _____

We, the undersigned, have read the OPERATOR'S MANUAL.

QUALIFIED OPERATORS

NAME	SHIFT	DATE

SAFETY GLASSES ARE REQUIRED WHEN OPERATING OR OBSERVING THE MACHINE.

MODIFICATION OR ALTERATION OF THIS MACHINE MAY BE HAZARDOUS. DO NOT MODIFY OR ALTER THIS MACHINE WITHOUT SCOTCHMAN'S WRITTEN PERMISSION.

LESSER QUALITY PARTS MAY LEAD TO INJURY. **Rev. # 1 2/90**

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MODEL
CPO-250

CPO-250

COLD SAW

Printed November 1991
Revision 1.0A

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1.0 INTRODUCTION

The CPO 250 Cold Saw is designed to cut solids, tubes, flats, and other profiles in grades of material that range from hot and cold rolled steel, annealed tool steels, stainless, aluminum, brass, copper, synthetics, and extrusions.

Cold sawing is a process similar to a milling process. In most cases, this combined with the self centering vise feature gives a finished cut that does not require any secondary machining or de- burring.

Since milling spindle speeds are used in cold sawing, there are several things that are required to achieve quality results. The selection of the proper pitch (number of teeth) on the blade and the proper spindle speed for the type of material being cut are critical. Proper material clamping and a good quality coolant are also important.

Cold sawing has several advantages over band saws and abrasive saws. Besides the mill quality cut, cold saws have the ability to generate faster cutoff times than band saws. There are no sparks and excessive noises that are associated with abrasive cutoff saws.

Cold saws also offer the advantage of blades that can be re- sharpened until the diameter of the blade will no longer cut through the material. The self centering vise allows for easy change over to special clamping jaws for profiles and extrusions. Having two spindle speeds enables the user to cut a wide range of materials.

By adding the power vise and power down feed options, the saw can be converted to a semi-automatic machine at a very reasonable price.

2.0 SAFETY PRECAUTIONS

1. Any individual operating this machine must be qualified, responsible, and well instructed. This manual is not intended to teach untrained personnel how to operate equipment.
2. Wear eye protection at all times when operating or observing this machine in operation.
3. Do not wear loose fitting clothing, gloves, or jewelry when operating this machine.
4. All electrical connections shall be made by a qualified electrician. This machine must be grounded in accordance with the National Electric code.
5. Disconnect the machine from the power source before performing maintenance or changing blades.
6. Practice good housekeeping. Keep the area around the machine clean and dry.
7. When sawing always support long pieces and make sure the material is properly clamped.
8. Keep the guard, as well as all other parts of the saw, in good working condition. Replace worn parts promptly.
9. Do not alter or modify this machine in any way without written permission from the manufacturer.
10. This machine is top heavy and must be anchored to the floor.

3.0 WARRANTY

Scotchman Industries Inc. will, within 12 months of date of purchase, replace F.O.B. the factory, or refund the purchase price for any goods which are defective in materials or workmanship, provided that the buyer returns the warranty registration card within thirty (30) days of purchase date, and at the seller's option, returns the defective goods, freight and delivery prepaid, to the seller, which shall be the buyer's sole and exclusive remedy for defective goods. Hydraulic and electrical components are subject to their respective manufacturer's warranties. Blades are warranted to be free from defects in material and workmanship within ten (10) days of purchase date. This warranty does not apply to machines or components which have been altered, changed, or modified in any way, or subjected to abusive or abnormal use, inadequate maintenance or lubrication, or subjected to use beyond the seller's recommended capacities and specifications. In no event shall seller be liable for labor costs expended on such goods or consequential damages. Seller shall not be liable to purchaser or any other person for loss or damage directly or indirectly arising from the use of the goods or from any other cause. No officer, employee, or agent of the seller is authorized to make any oral representations or warranty of fitness or to waive any of the foregoing terms of sale and none shall be binding on the seller. Any electrical changes made to the standard machine to comply with local electrical code variation must be paid by the purchaser.

As we constantly strive to improve our products, we reserve the right to make changes without notification.

4.0 INSTALLATION AND SET-UP

➽ **CAUTION: THIS SECTION DISCUSSES INSTALLATION, SET-UP, AND START -UP PROCEDURES. PLEASE READ THOROUGHLY BEFORE OPERATING THIS MACHINE. IF YOUR MACHINE IS EQUIPPED WITH EITHER THE POWER VISE OR THE POWER DOWN FEED OPTION, READ ALL SECTIONS CONCERNING THESE OPTIONS BEFORE OPERATING THE SAW.**

4.1 PHYSICAL DIMENSIONS

SEE FIGURE 1 BELOW.

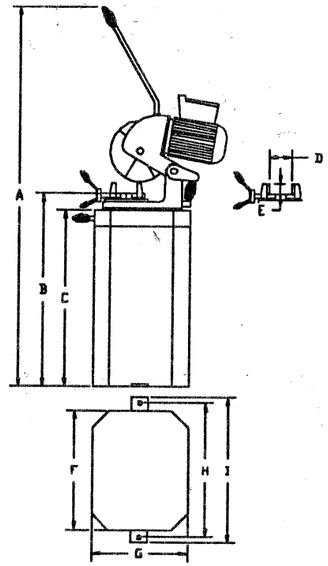


FIGURE 1

DIMENSIONS	INCHES	CM.
A. HEIGHT	68.75	174.6
B. FLOOR TO VISE	36.375	92.4
C. BASE HEIGHT	32	81
D. VISE OPENING	4	10
E. VISE DEPTH	2	5
F. BASE WIDTH	21.625	55
G. BASE DEPTH	17.25	44
H. MOUNTING HOLE CENTERS	24.125	61
I. WIDTH	26.125	66
J. WEIGHT	400 LB.	181 KG

4.2 MACHINE MOVING PROCEDURES

SEE FIGURE 2 BELOW.

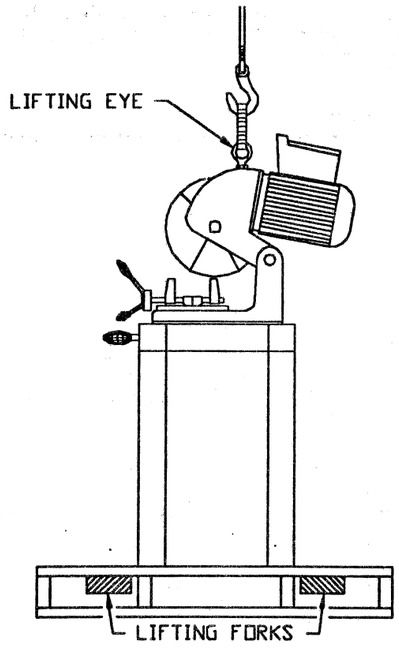


FIGURE 2

This machine is shipped on a pallet and can be moved to the installation location by means of a fork lift.

➽ **CAUTION: THIS MACHINE IS TOP HEAVY AND MUST BE MOVED WITH CARE ON HARD FLAT SURFACES ONLY.**

All saws, except models equipped with the power down feed option, are shipped with the head locked in the "DOWN" position. Before lifting the machine, release the head by opening the material vise and allow it to move to the "UP" position. Lift the machine using the lifting eyelet provided. SEE FIGURE 2 ABOVE. Remove the pallet and place the machine in its final location. This machine is top heavy and must be anchored to the floor.

4.3 PHYSICAL INSPECTION

Once the machine is located, check it for any possible damage incurred in shipment.
Remove the lifting eyelet and install the draw handle.

➽ **CAUTION: DO NOT USE THE LIFTING EYELET FOR ANY MACHINES OTHER THAN THIS SAW. MAKE SURE THE DRAW HANDLE HAS A JAM NUT ON THE THREADS BEFORE INSTALLING IT ON THE SAW. IF THE HANDLE IS INSTALLED WITHOUT THE JAM NUT, IT MAY CONTACT THE GEARS INSIDE THE HEAD.**

Remove any other packing material and draw the saw head to its "DOWN" position to make sure the guard opens properly. The guard should close completely when the head is up and open freely as the head travels down. If the guard is not functioning properly, REFER TO SECTION 4.5 ON PAGE 8 for adjustment instructions.
With the head in the "DOWN" position, check the oil level in the gear box through the sight glass in the casting just below the draw handle.
Install the thirty (30) inch (76 cm) material length stop. The length stop mounts on the right side of the vise base.
If your saw is equipped with either the power vise or the power down feed option REFER TO SECTIONS 7.1 AND 7.2 PAGES 18 THRU 21 for additional information.

4.4 ELECTRICAL REQUIREMENTS

SEE FIGURE 3 BELOW.

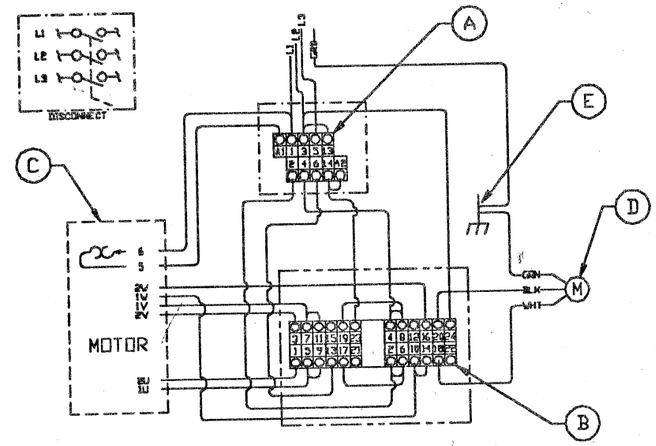


FIGURE 3

A	**CONTACTOR**
B	**MAIN SWITCH**
C	**MOTOR**
D	**COOLANT PUMP**
E	**GROUND LUG**

➽ **CAUTION: ALL ELECTRICAL CONNECTIONS SHOULD BE MADE BY A QUALIFIED ELECTRICIAN TO PREVENT DAMAGE TO THE MACHINE AND DANGER TO THE OPERATOR. THIS MACHINE OPERATES WITH LIQUID COOLANT AND MUST BE GROUNDED IN ACCORDANCE WITH NATIONAL ELECTRIC CODES.**

All machines are wired for three phase power. The motors are dual speed and will operate on one voltage only. If the machine is not the same voltage as your plant voltage, you will have to replace the motor and the coolant pump. The supply voltage should be (+ or -) 10% of the motor voltage rating to insure satisfactory performance. Check the motor data tag for full load current requirements. Because of the two speeds, single phase motors are not available and a phase converter must be used. As with most machines, phase converters may reduce the performance of the machine slightly. THE ELECTRICAL DIAGRAM FOR THIS MACHINE IS ON PAGE 7 FIGURE 3.
For supply lines ten feet (303 cm) or shorter, we recommend 12 gauge wire. For lines longer than ten feet (303 cm), we recommend 10 gauge wire. We do not recommend supply lines over twenty feet (606 cm) in length.

CPO-250-LT. (30-60 RPM)

MOTOR VOLTAGE	FULL LOAD CURRENT		HORSEPOWER	
	HI	LOW	HI	LOW
208	4.9	4.7	1.5	.75
230	4.7	4.5	1.5	.75
460	2.6	2.5	1.5	.75
230 w / Phase	4.9	4.7	1.5	.75

CPO-250-HT. (60-120 RPM)

MOTOR VOLTAGE	FULL LOAD CURRENT		HORSEPOWER	
	HI	LOW	HI	LOW
208	7.9	5.7	2	1.6
230	7.7	5.5	2	1.6
460	4	2.9	2	1.6
230 w / Phase	7.9	5.7	2	1.6

4.5 MACHINE START-UP

Before starting this machine,take the time to review the operator's manual thoroughly to familiarize yourself with all the functions of the machine.
We strongly urge you to follow OSHA directive (CFR-1910.147 effective 09-09-90) regarding lock-out, tag-out procedures. Keep in mind that the directive refers to all hazardous energy sources, not just electrical. On machines equipped with either a power vise or a power down feed, the air supply must also be disconnected and locked or tagged. Scotchman offers a lock-out switch for this machine as an option if your plant is not equipped with lock-out capabilities. If you are interested in this option, REFER TO SECTION 7.7 ON PAGE 22 or contact your local dealer or the factory.
Do not install a blade on the saw until after it has been powered and cycled several times. To power the machine, the Hi-Low switch must be turned 20 Degrees past either the Hi or the Low position to energize the contactor. Once the contactor has been energized, it will remain energized until the machine is disconnected from the power source.
Once the machine has been powered, check the rotation of the spindle. There is an arrow on the guard showing the proper rotation. If the rotation is not correct, the electrician will have to switch two of the three line wires.
If the saw is equipped with either the power vise or the power down feed options, SEE SECTIONS 7.1 & 7.2 ON PAGES 18 THRU 21 for additional information on electrical and air connections.

4.6 GUARD ADJUSTMENT

SEE FIGURE 4 BELOW.

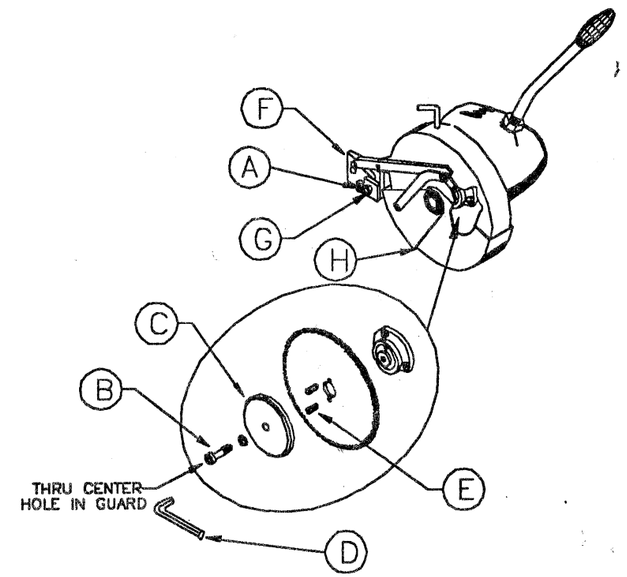


FIGURE 4

The proper adjustment of the blade guard on this machine is crucial to the operation of the machine and the safety of the operator. If the guard will not maintain proper adjustment, check the guard mounting bolts and rivet joints in the guard and linkage for wear. Replace worn parts promptly.
Use the following steps to adjust the blade guard:

1. Turn the power off and disconnect from the power source.
2. With the head in the "UP" position, loosen the jam nut (G) on the guard cam (F).
3. Manually hold the guard open approximately 1/8 of an inch (3 mm) at point (H).
4. Rotate the guard cam (F) counter-clockwise until there is tension on the linkage bar. Re-tighten the jam nut (G).
5. Manually cycle the head up and down several times making sure the guard operates properly.

4.7 COOLANT SYSTEM

The coolant reservoir has a capacity of ten (10) gallons (37.8 liters). One gallon of coolant is shipped with the saw. For normal cutting, it should be mixed in a ratio of one part coolant to ten parts water. In conditions of heavier cutting, the ratio of water should be reduced to seven parts.
We recommend using only pure, synthetic, water soluble cutting oils. Petroleum based cutting oils will reduce the life of the coolant pump considerably.
There is a sieve screen in the back of the cast vise base. To aid in adding coolant, the sieve screen can be removed with a screwdriver. Do not remove the sieve screen if the base of the saw is not completely clean and free of chips. The panel on the back of the machine base can also be removed to aid in adding coolant.
When cutting alloy steels such as stainless steel, we recommend a special mix coolant designed for these applications. SEE SECTION 10.6 ON PAGE 53 for additional information on available coolants.

5.0 MAINTENANCE AND LUBRICATION

5.1 LUBRICATION

SEE FIGURE 5 BELOW.

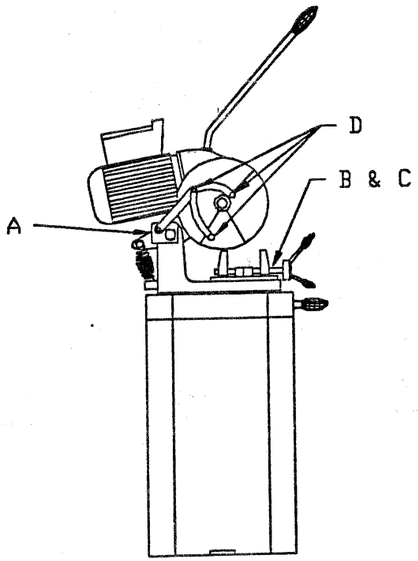


FIGURE 5

Before operating the saw, grease the pivot pins (A) and apply penetrating oil to the vise spindle and guides (B and C).
Once a week, grease all the pivot pins and oil all the rivet connections on the guard linkage.
Clean the chips out of the vise every day and apply penetrating oil to the spindle and guide pins.
SEE SECTIONS 7.1 AND 7.2 ON PAGES 18 THRU 21 for additional information if your saw is equipped with a power vise or power down feed option.

5.2 CUTTING OILS AND LUBRICANTS

Section 10.6 on page 53 lists Scotchman's part numbers for cutting oils and lubricants. Using high quality lubricants and oils will greatly increase the life of this equipment.
We recommend using only pure, synthetic, water soluble cutting oil for coolant. For the saw head, use a EPA 80-90 wt. gear lubricant such as Cenex (MIL-L2105C) or equivalent. On saws equipped with the power down feed, use a 10 wt. non foaming, hydraulic oil such as Cenex (CEN-LUBE RO AW 150) or equivalent in the reservoir. On saws equipped with air lubricators, use a high quality air line lubricant designed for automatic oilers.

5.3 SCHEDULED MAINTENANCE

A program of scheduled maintenance should be set up and documented according to your application and the frequency you use this machine. The following is a list of some important things that should be included in a scheduled maintenance program:

1. Every 250 hours or 3 months:

Drain the coolant reservoir and flush it out. Refill the coolant reservoir with new coolant. This will extend the life of the coolant pump considerably.

2. Every 500 hours or 6 months:

Drain the gear lube from the saw head and flush with a petroleum product. Refill the saw head with a 90 weight gear lube. Check the condition of the pivot pins on the head and on the guard. Check the complete saw for loose connections in the electrical and air systems.
If your saw is equipped with the power vise or power down feed options, SEE SECTIONS 7.1 AND 7.2 ON PAGES 18 THRU 21 for additional information. Since every application is different, each user must design and implement a scheduled maintenance program that fits his applications.

6.0 MACHINE OPERATION

6.1 INSTALLING BLADES

SEE FIGURE 6 BELOW.

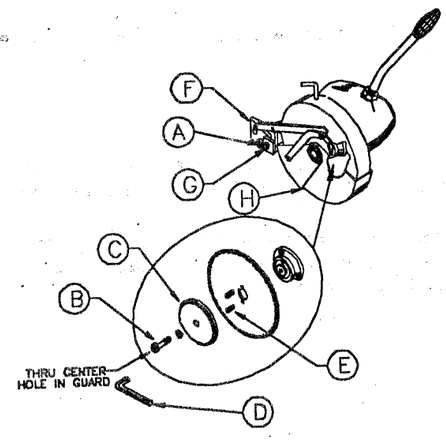


FIGURE 6

CAUTION: USE ONLY HIGH SPEED STEEL BLADES DESIGNED FOR THIS MACHINE. DO NOT MODIFY ANY BLADE TO FIT THIS MACHINE. DO NOT USE BLADES DESIGNED FOR THIS MACHINE ON ANY OTHER EQUIPMENT.

The CPO-250 saw is designed to use a maximum 10 inch (250 MM) diameter blade. The arbor size is 32 mm with two 8 mm pins spaced at 45 mm.
Before installing the blade, make sure the power to the machine is off. Use the following steps to install a blade: (An 8mm hex key wrench (D), shipped with each machine, is required to change blades).

1. **Remove the bolt (A) from the guard linkage with the hex key wrench (D) and manually open the guard.**
2. **Remove the blade bolt (B) through the center hole in the blade guard.**
3. **Remove the blade flange (C).**
4. **Install the blade. Make sure the pin holes line up to the holes in the spindle.**
5. **Replace the blade flange and start the bolt into the spindle.**
6. **Before locking the blade in position, the back lash must be taken up. To take up the back lash, rotate the bottom of the blade to you until it seats against the drive pins.**

CAUTION: THE BLADES ARE VERY SHARP AND CARE MUST BE TAKEN WHEN REMOVING THE BACK LASH. DO NOT GRIP THE CUTTING EDGE OF THE BLADE BARE HANDED. THE BACK LASH MUST BE TAKEN UP EVERY TIME A BLADE IS CHANGED.

7. **After taking up the back lash, tighten the blade bolt (B).**
8. **Break in the saw blade. The teeth on new or re-sharpened blades have a sharp edge and should be manually feed through the first three or four cuts very slowly before starting normal cutting.**

Besides taking up the back lash and breaking in the blade, it is very important to keep the blade flange, the spindle, and the blade clean and free from nicks. Failure to do these things will result in broken or damaged blades.

6.2 SAW CAPACITIES

SEE FIGURE 7 BELOW.

CAPACITIES WITH MAXIMUM DIAMETER BLADES 10 IN. (250 MM)		90°	60°	45°
○	INCHES	3-1/8ø	3-1/8ø	3-1/8ø
	MM.	80ø	80ø	80ø
□	INCHES	$2\frac{3}{4}$ X $2\frac{3}{4}$	$2\frac{3}{8}$ X $2\frac{3}{8}$	$2\frac{3}{8}$ X $2\frac{3}{8}$
	MM.	70 X 70	60 X 60	60 X 60
⊓	INCHES	$2\frac{3}{4}$ X $2\frac{3}{4}$	$2\frac{3}{8}$ X $2\frac{3}{8}$	$2\frac{3}{8}$ X $2\frac{3}{8}$
	MM.	70 X 70	60 X 60	60 X 60
⌐	INCHES	$2\frac{3}{4}$ X $2\frac{3}{4}$	$2\frac{3}{8}$ X $2\frac{3}{8}$	$2\frac{3}{8}$ X $2\frac{3}{8}$
	MM.	70 X 70	60 X 60	60 X 60
▭	INCHES	$3\frac{1}{2}$ X $2\frac{3}{8}$	$3\frac{1}{8}$ X $2\frac{3}{8}$	$2\frac{3}{8}$ X $2\frac{3}{8}$
	MM.	88 X 60	80 X 60	60 X 60
●	INCHES	1-1/2ø	1-1/4ø	1ø
	MM.	35ø	30ø	25ø
■	INCHES	$1\frac{1}{2}$ X $1\frac{1}{2}$	$1\frac{1}{4}$ X $1\frac{1}{4}$	1X1
	MM.	35X35	30X30	25X25

FIGURE 7

Figure 7 Above is a chart showing the maximum capacities of this machine in various materials at the most common angles from 0 degrees to 90 degrees.

6.3 SELECTING THE PROPER BLADE AND CUTTING SPEED

In cold sawing there is no such thing as a general purpose blade. To achieve the best results from your saw, proper blade selection is important. Each saw is shipped with a pitch (number of teeth) calculator which will help determine the proper blade for your application.

When sawing flat stock or rectangular solid sections, determine the thickest section that will be cut and use the equivalent square size on the pitch calculator to determine the proper blade.

The proper blade speed is also important. The CPO-250 is available in two models. The LT. model is a 30-60 RPM and the HT. model is a 60-120 RPM.

The HT. model (60-120 RPM) is recommended primarily for thin wall tube up to 1/8 of an inch (3 mm) wall thickness and non- ferrous materials. The low speed 60 RPM should be used for tubes with wall thickness of one hundred thousands (.025 mm) and thicker and for solid sections of non-ferrous materials. The High speed (120- RPM) is recommended for thin walled tubes and non- ferrous tubes and profiles. Some materials will require test cuts at both speeds to determine the best speed for the application.

The LT. model (30-60 RPM) is recommended for cutting solid sections, alloy tubes, and non ferrous materials. The Low speed 30 RPM is recommended for solid sections of mild steel and alloy tubes. The high speed 60 RPM is recommended for tubes and non- ferrous materials. As with the HT. model, some materials will require test cuts to determine the best speed.

6.4 MATERIAL CLAMPING

All work pieces must be clamped securely in the vise. Any slippage of the material can result in broken or damaged blades. The material should be clamped so the contact surface between the material and the blade is as small as possible. For this reason, when cutting flat stock material, we recommend standing it up and cutting it through the thinnest section whenever possible. If the flat stock is too wide to clamp standing up, clamp it in the vise diagonally. We also recommend cutting square tubing through the diagonal section and angle iron with the web up. SEE FIGURE 8 PAGE 15 for examples. This is not always possible when cutting materials at a miter. Some thin walled round sections and profiles will require special jaws to hold them.

When trimming or cutting very short pieces that do not extend into both sides of the vise, place a piece of material the same size in the unused side of the vise to insure uniform clamping.

When setting up the saw to miter cut, pull the head down before making the first cut to make sure the blade clears the vise jaws. The steel jaws have slotted mounting holes and can be adjusted for various miters. Always adjust the steel jaws so they clamp the material as close to the blade as possible whether miter or straight cutting.

All models of the CPO-250, except those fitted with the power down feed option, have a down stroke or cutting depth adjustment. SEE FIGURE 9 PAGE 15. This adjustment is used to keep the saw blade from cutting into the vise spindle and must be adjusted when changing sizes of materials or blades.

If your saw is equipped with either the power vise or the power down feed options, SEE SECTIONS 7.1 & 7.2 ON PAGES 18 THRU 21 for additional information.

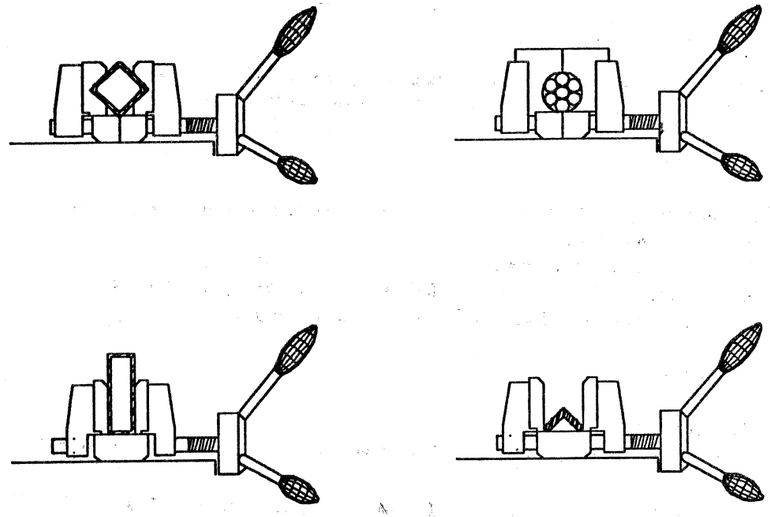


FIGURE 8

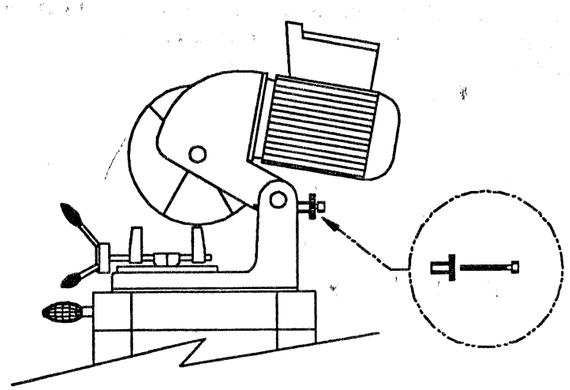


FIGURE 9

6.5 MITER LOCKING DEVICE

SEE FIGURE 10 PAGE 17.

All models, except those equipped with the power vise option, are equipped with a miter locking device which allows quick set-up for mitering at 45 degrees left and right, and 90 degrees for straight cutting.

To use the miter locking device:

1. **Unlock the tension handle (A).**
2. **Push the miter lock release handle (B).**
3. **Turn the head in the direction you want to miter.**
4. **Release the miter lock handle and continue turning the head until the pin snaps into the slot.**
5. **Then re-lock the tension handle. When locking the tension handle, do not over-tighten.**

If you want to cut miters other than 45 degrees:

1. **Unlock the tension handle (A).**
2. **Push the miter lock release handle (B), and turn the head to the desired angle by using the scale on the saw.**

☛ **NOTE: THE SCALE IS READ ON THE LEFT SIDE OF THE VISE AT POINT (C) NOT IN THE CENTER.**

3. **Re-lock the tension handle (A).**

After a period of time, the tension handle (A) may need to be adjusted if the head will not remain in the position it was previously set.

To re-set the tension handle:

1. **Remove the access panel on the back of the machine base.**
2. **Move the tension handle (A) to its unlocked position.**
3. **Loosen the jam nuts (D) on the adjustment bolts (E), and tighten the bolts finger tight plus 1/4 of a turn.**
4. **Work the tension handle several times and re-tighten the adjusting bolts if necessary.**
5. **Re-tighten the jam nuts (D).**

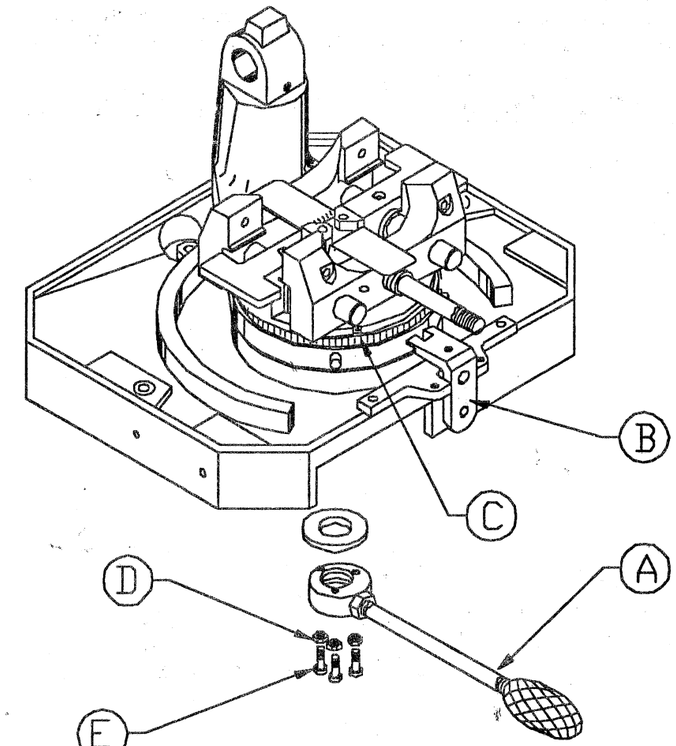


FIGURE 10

7.0 OPTIONAL EQUIPMENT

7.1 POWER VISE

The power vise is an option that is normally ordered with the saw. A retrofit kit is available from your local dealer or the factory. The kit includes all parts required plus complete installation instructions.
The power vise allows automatic clamping of the material which improves productivity and reduces operator fatigue. The vise automatically clamps when the saw head is drawn down and releases when the saw head returns.

7.1A POWER VISE SET-UP AND MAINTENANCE

SEE FIGURE 11 BELOW.

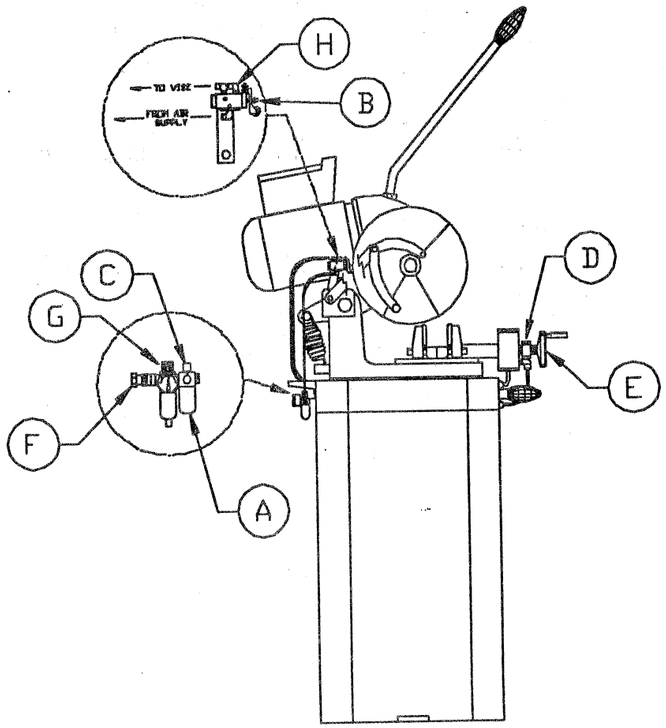


FIGURE 11

The following is set-up and maintenance instructions for the power vise option (retrofit or factory installed):

1. **Before connecting the air supply to the saw, make sure the filter/lubricating device (A) is full of oil.**
2. **Slide the shuttle valve (F) on the filter/ lubricator device down to the closed position.**
3. **Connect the air supply to the shuttle valve. Make sure the vise is clear and the head is in the "UP" position.**
4. **Slide the shuttle valve up to open the valve. Whenever the shuttle valve is closed, it bleeds the air pressure out of the system automatically.**
5. **Adjust the air pressure regulator (G). 90 PSI (6.2 BAR) is the minimum operating pressure. 105 PSI (7.2 BAR) is the maximum.**
6. **Before powering the saw, pull the head down several times to make sure the four way valve (H) and the lubricating device (A) are adjusted properly and the air pressure setting remains constant.**
7. **The four way valve should activate the vise at the beginning of the down stroke and release it at the top of the return stroke. The four way valve is adjusted with the set screw (B) in the valve arm just above the roller.**
8. **The lubricating device (A) should release one drop of oil every 5 to 10 cycles. On top of the lubricating device is a clear plastic dome with a small copper tube inside. The oil should drop out of the copper tube. The lubricating device is adjusted by turning the set screw (C) on the top of the lubricator.**

To adjust the vise to the size of material being cut, release the locking collar (D) on the vise spindle. The vise spindle is left hand threaded and the locking collar must be turned clockwise to release it:

1. **Open the vise using the positioning handle (E) and place the material in the vise.**
2. **Crank the vise closed to within approximately 1/8 of an inch (3 mm) from the material and re-lock the locking collar (D). Failure to lock the locking collar may allow the vise to vibrate open while cutting, causing damage or breakage of the blade.**

The power vise has approximately 1/4 of a inch (6 mm) of stroke.
As with the manual vise, proper clamping is very important and special jaws may be required for some materials.

REFER TO FIGURE 8 ON PAGE 15 FOR EXAMPLES.

7.2 POWER DOWN FEED

The power down feed option used in conjunction with the power vise option changes a manual saw into a semi-automatic saw. These options will increase productivity and reduce operator fatigue.
The power down feed option cannot be retrofit to machines with serial number 11940491 and prior serial numbers in the field. This option can be used on machines with or without the power vise option.

7.2A POWER DOWN FEED SET-UP AND MAINTENANCE

SEE FIGURE 12 PAGE 21 .

1. Before powering the saw, check the oil level in the reservoir (A). It should be approximately 7/8 full with the saw head in the "DOWN" position. The head can be drawn down manually by opening the flow control valve (B) and pulling the draw handle (C). The recommended oil is a 10 wt. non foaming hydraulic oil.
2. After checking the oil level, manually return the saw head to its "UP" position.
3. Slide the shuttle valve (D) to its "CLOSED" position and connect the air supply.
4. Slide the shuttle valve to its "OPEN" position and adjust the air pressure regulator (I). 90 PSI (6.2 BAR) is the minimum operating pressure. 105 PSI (7.2 BAR) is the maximum.
5. Without powering the saw, manually cycle the head up and down several times to purge the air out of the lines. The head may cycle irregularly the first few cycles.
6. After cycling the head, shut the flow control valve (B) off. Then open it one turn.

Before powering the machine, the down stroke of the saw head and the fast approach cam must be adjusted. The down stroke of the saw head is set with the star nut (E). It should be set low enough to allow the blade to cut through the work piece but not so low that the blade will cut into the vise.
The fast approach is set with the stroke adjustment cam (F). The cam must be adjusted so the saw head stops its rapid approach before the blade contacts the work piece. It must be adjusted every time the size of the work piece changes. If the saw blade contacts the work piece on rapid approach, the blade will be damaged or broken. After making these adjustments, power the saw and cycle it several more times to make sure the adjustments are correct. Adjust the flow control valve (B) to the proper cutting feed rate before cutting any material.
The lubricating device (G) should produce a drop of oil every 5 to 10 cycles. It can be adjusted by the set screw (J) on the top of the lubricator. There is a clear plastic dome (H) on top of the lubricator with a copper tube inside. The oil should drop from the copper tube. The oil in the lubrication device should be checked every day. The oil level in the reservoir should be checked every week. REFER TO SECTION 5.2 ON PAGE 10 for recommended fluids.

As with all other functions of the saw, selection of the proper blade, spindle speed, and clamping are very important in providing a quality finished product.

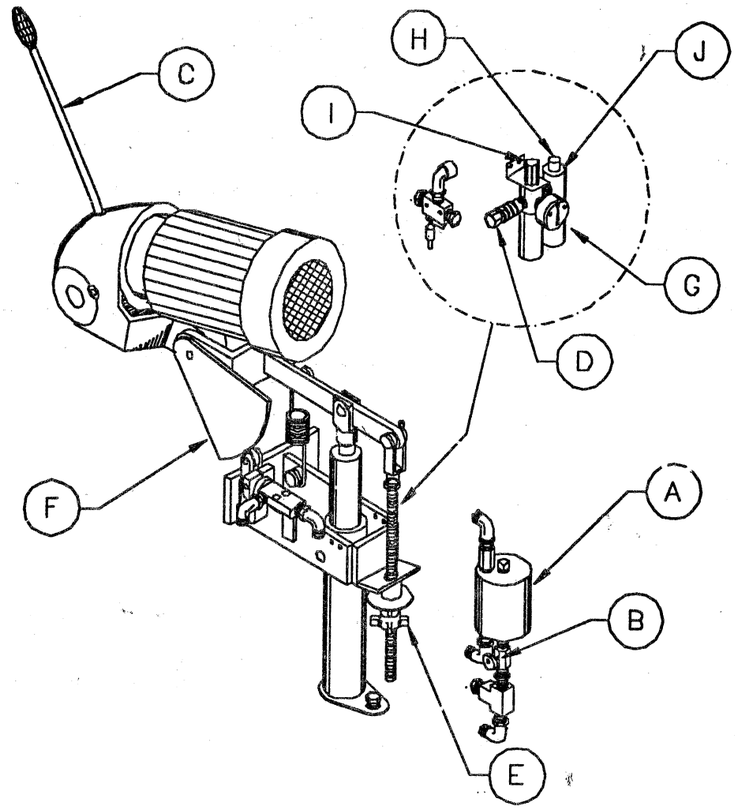


FIGURE 12

7.3 MATERIAL SUPPLY TRACKS

A ten foot roller supply track that can be bolted to the input side of the saw to support longer pieces of material is an available option for this saw. The supply tracks can also be bolted end to end to supply longer tracks if needed. The ten foot supply track bolts to the machine on the left side of the base casting.
SEE SECTION 10.3 PAGE 48 FOR PARTS IDENTIFICATION.

7.4 DISCHARGE TRACKS WITH SCALES

Roller discharge tracks with incremental scales are available in three lengths:40 inch, 80 inch, and 120 inch (101, 202, & 303 CM). The discharge tracks mount to the machine in place of the 30 inch (76 CM) stop that was provided with the machine. The discharge tracks allow fast set-up and accuracy for various lengths of cuts.
After a discharge track is mounted, the scale should be calibrated. To do this, draw the saw head down and slide the length stop (A) up to the blade. Loosen the bolt (N) in the reading block (M) and adjust the reading block to 0.
SEE SECTION 10.4 PAGE 50 FOR PARTS IDENTIFICATION.

7.5 SPECIAL VISE JAWS

Special vise jaws for holding square tubing, rectangular tubing, and angle iron are stock items. Jaws for holding thin wall round tubes, profiles, and bundles are available on a made-to-order basis. For prices and delivery on special jaws, contact your local dealer or the factory. SEE SECTION 10.2 PAGE 44 for additional information.

7.6 PHASE CONVERTERS

Static phase converters are available to convert 230 volt single phase power to 230 volt three phase power. Different phase converters are required for different models.

SEE SECTION 10.6 PAGE 53 FOR ADDITIONAL INFORMATION.

➽ CAUTION: SCOTCHMAN WILL NOT WARRANTY ANY RELATED ELECTRICAL PARTS DAMAGED BY A PHASE CONVERTER UNLESS THE PHASE CONVERTER WAS SUPPLIED BY SCOTCHMAN AND INSTALLED BY AUTHORIZED PERSONNEL.

7.7 LOCK-OUT DISCONNECT SWITCH

A lock-out disconnect switch is available for this machine if your plant is not equipped with lock out capabilities. The switch mounts on the base of the saw and is shipped complete with all the necessary parts and installation instructions.

SEE SECTION 10.7 ON PAGE 54 FOR PARTS IDENTIFICATION.

8.0 TROUBLE SHOOTING GUIDE

8.1 ELECTRICAL TROUBLE SHOOTING

1. The motor will not run:

A. Some models have a lock-out switch in the base of the saw. If your saw has this option, make sure it is in the "ON" position.
B. The HI-LOW switch must be turned 20 degrees past either HI or LOW to energize the contactor if the saw has been disconnected from the power supply.
C. If the contactor is energized and motor will not run, disconnect the machine from the power source and check the switch for any loose connections or disconnected wires.
D. Also check the supply voltage to the saw to make sure it is the same as the motor voltage. If the supply voltage is correct, the switch energizes, and the motor still will not run, contact your local dealer or the factory.

2. The saw motor runs but does not have adequate power:

A. Make sure the supply voltage and phase correspond to the saw motor's voltage and phase.
B. Disconnect the machine from the power source and check for any loose or disconnected wires.
C. The supply lines to the machine must be of adequate size to handle the load. SEE SECTION ON 4.4 PAGE 7 for recommended sizes and lengths.
D. The worm gears in the head may be damaged. With the power to the machine disconnected, check the blade spindle for any free travel. If free play is present, drain the oil from the head and remove the motor. Check both worm gears for wear and replace if necessary. We recommend replacing the worm gears as a set if either shows wear.

8.2 BREAKAGE OR EXCESSIVE DULLING OF BLADES

1. Select the proper blade and spindle speed for the material being cut. REFER TO SECTION 6.3 ON PAGE 14 for recommendations.
2. Always break in the blade before you start normal cutting.
3. Do not apply excessive down pressure on the work piece. Excessive down pressure will cause the teeth to remove too large of a chip, resulting in premature dulling or breakage.
4. Use a good quality, synthetic coolant and maintain the proper ratio of coolant to water as recommended in SECTION 4.6 PAGE 9.
5. Have your blades re-sharpened by someone who has the right equipment for circular cold saw blades. Improper re-sharpening is one of the most common problems encountered in cold sawing.
6. Keep the blade flange, the face of the blade spindle, and the blade clean and free from nicks. Any contamination or nicks on the flange, spindle, or the blade will cause the blade to run out of alignment.
7. Always remove the back lash when installing a blade. REFER TO SECTION 6.1 PAGE 12 for instructions. Also check the condition of the drive pins when replacing the blade. If the drive pins are broken or worn, replace them.
8. Any of the above problems may cause a condition known as pick- up. Pick-up is caused when small pieces of the material being cut adhere themselves to the blade. When pick-up is present, you will feel a jerking or jumping motion in the saw head while cutting. This is caused by the blade being pinched as it goes through the material where the pick up is present.

Pick-up can be removed by using a fine honing stone or a very fine file. When removing pick-up, care must be taken not to remove any part of the blade. After the pick-up has been removed, review the above items to determine what caused the problem.

8.3 COOLANT SYSTEM

1. If coolant will not flow:

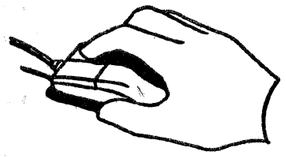
A. Check the wiring connections to the pump and make sure the pump is running.
B. Check the level of the coolant in the reservoir.
C. Check the reservoir for contamination or sludge build-up that may be blocking the pump inlet.
D. Remove the coolant line from the guard and make sure it's clear. Also make sure the valve on the guard is open.

2. If the coolant pump is leaking:

A. Check the connections on the coolant lines.
B. If the pump itself is leaking, there is a seal kit available.

SEE SECTION 9.6 PAGE 36 FOR PART NUMBERS.

9.0 PARTS LISTS



THE FOLLOWING SECTIONS CONTAINS THE SAW AND OPTIONAL EQUIPMENT PARTS LISTS AND DRAWINGS

9.1 SAW HEAD

Item	Part Number	Description
A	075080	Key 7 x 8 x 32 mm
B	077151	Spindle Shaft
C	077143	Spindle Cap
D	075075	Seal
E	077146	Gasket
F	075076	Roller Bearing
G	077147	Spacer Ring
H	077148	Spacer Bushing
I	077149	Worm Gear (Bronze)
J	075081	Snap Ring
K	077150	Needle Bearing
L	077153	Drain Plug
M	077141	Head Casting
N	077152	Sight Gauge
O	077138	Knob
P	077105	Draw Handle
Q	073210	M-20 Jam Nut
R	077142	Grease Nipple
S	221210	M-10 x 25 SHCS
T	077104	Pivot Shaft
U	077190	Worm Gear (Steel)
V	077189	Locking Nut
W	077145	Drive Pins
X	077144	Blade Flange
Y	212012	M-10 Lock Washer
Z	221210	M-10 x 25 SHCS
AA	073692	Lifting Lug
BB	077107	Complete Head Assembly
CC	077859	Head Gasket (Not Pictured)

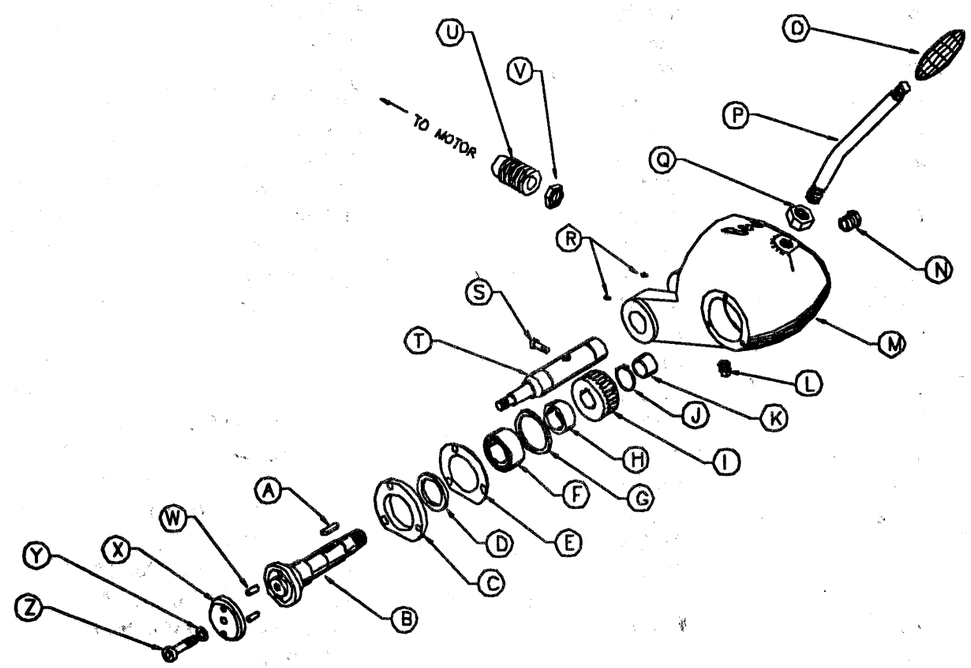


FIGURE 13

9.2 VISE ASSEMBLY

Item	Part Number	Description
A	221215	M-10 x 35 SHCS
B	077128	Cast Grip Cheek (Rear)
C	077119	Vise Jaw (Right)
D	208012	M-10 Hex Nut
E	077120	Guide Shaft
F	218030	M-8 x 12 SS
G	077130	Base
H	077100	Dowel Pin
I	077133	Screw End
J	077136	Pressure Plate
K	077135	Tension Nut
L	208010	M-8 Hex Nut
M	073329	M-8 x 45 SHCS
N	210016	M-16 Jam Nut
O	077137	Tension Handle
P	077138	Knob
Q	077139	Knob
R	077140	Spindles
S	077121	M-20 x 1.5 Jam Nut
T	077122	Covering Cap
U	060265	Boss
V	077125	Cast Grip Cheek (Front)
W	077126	Vise Jaw (Left)
X	060035 also need 60330	Vise Spindle Serial # 1001-289 and Up Mfg. After 02-01-89
XA	077127	Vise Spindle Saws Mfg. Prior To 02-01-89
Y	073420	M-8 x 16 SHCS
Z	077117	Covering Cap
AA	077129	Protecting Plate
BB	077118	Support Block
CC	073455	M-5 x 20 SHCS
DD	077103	Complete Vise Assembly
EE	076937	Square Tube Jaws

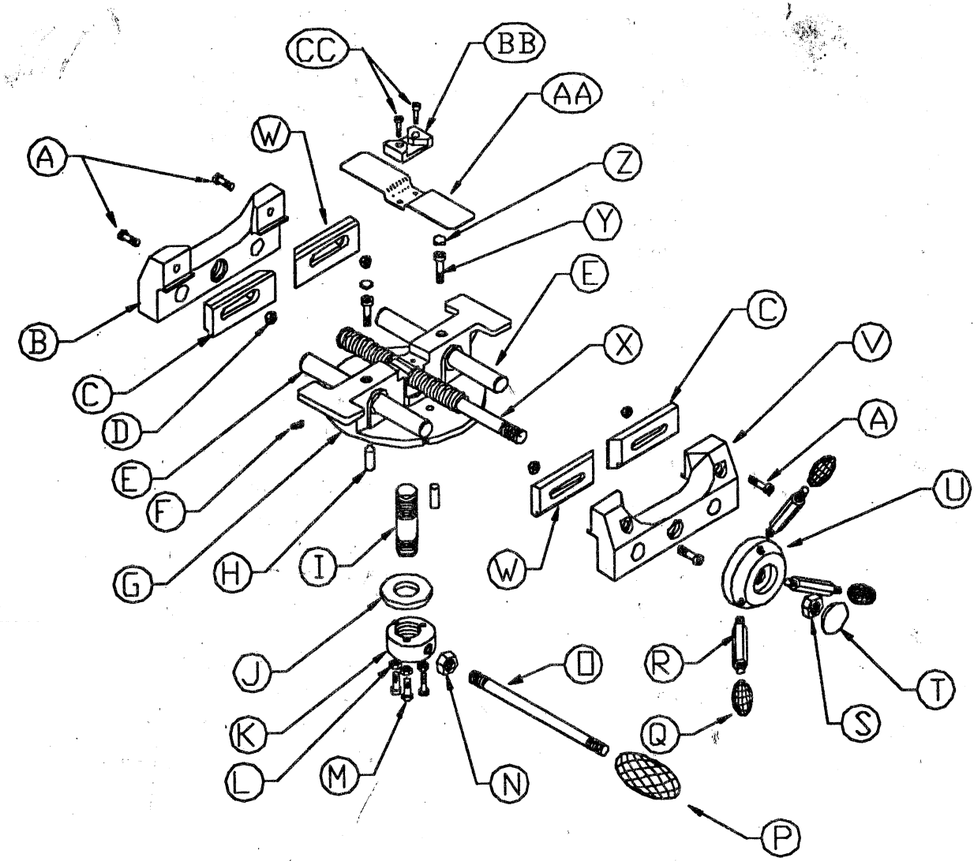


FIGURE 14

9.3 GUARD ASSEMBLY

Item	Part Number	Description
A	077169	Guard Shell
B	221120	M-8 x 25 SHCS
C	077164	Spacer Ring (Thick)
D	077168	Hinged Cap (Front)
E	077165	Spacer Ring (Thin)
F	077170	Hinged Cap (Rear)
G	077166	Bushing
H	077167	Snap Ring
I	077160	M-8 Plastic Washer
J	077163	Coupling Rod
K	077162	Rivet
L	077161	Self Locking Ring
M	077171	Coupling Rod
N	077156	M-6 x 8 x 12 Shoulder Bolt
O	077158	Washer
P	077172	Lever
Q	073626	M-10 x 20 SHCS
R	073211	M-14 Hex Nut
S	077173	Clamp Block
T	077174	Curve Plate
U	073108	M-8 Lock Washer
V	077157	M-6 Hex Nut
W	077155	Petcock
X	077154	Connecting Pipe
Y	060140	Coolant Line
Z	077106	Complete Guard Assembly
AA	077870	Complete Shell Parts (A-E)

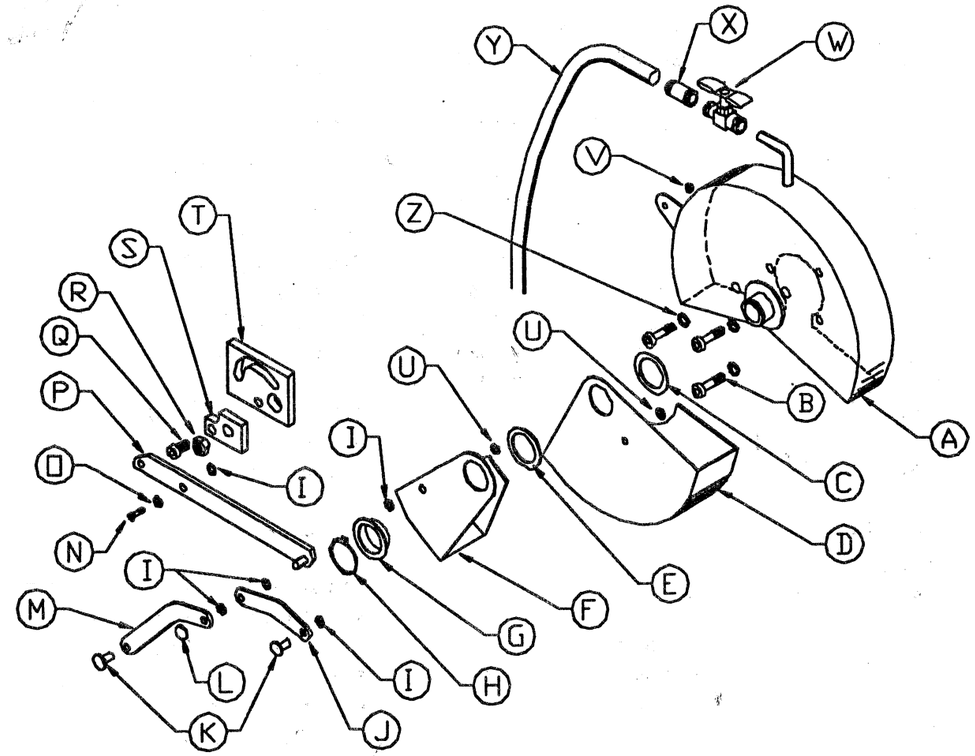


FIGURE 15

9.4 MOTOR ASSEMBLY

The machines are equipped with either a Hanning or Emod motor. If the motor data tag does not specify which brand it is, check the cooling fins on the motor. The Hanning motor's fins are square on the ends. The Emod motor's fins are rounded and tapered on the ends.

Item	Part Number Hanning	Emod	Description
A	076555	076555	Fan Cover
B	N / A	073660	M-5 x 8 SHCS
C	076880	076880	Fan
D	076557	077194	End Casting
E	N / A	075050	Distance Ring
F	075049	075049	Rear Bearing (6205 Z)
G	076369	076369	Key 6 x 6 x 15 mm
H	073325	073325	M-8 x 25 SHCS
I	075053	075053	Key 6 x 6 x 30 mm
J	075047	075047	Seal
K	075048	075048	Front Bearing (5305 C)
L	077191	077191	Safety Ring
M	077192	N / A	End Casting (Front)

Complete Motors (without Switches)

A	076968	60-120 RPM / 230 Volt
B	076970	60-120 RPM / 460 Volt
C	076962	30-60 RPM / 230 Volt
D	076964	30-60 RPM / 460 Volt
E	076972	60-120 RPM / 575 Volt
F	076966	30-60 RPM / 575 Volt

Complete Motor Assemblies (with Switches)

A	076858	60-120 RPM / 230 Volt
B	076860	60-120 RPM / 460 Volt
C	076852	30-60 RPM / 230 Volt
D	076854	30-60 RPM / 460 Volt
E	076862	60-120 RPM / 575 Volt
F	076856	30-60 RPM / 575 Volt

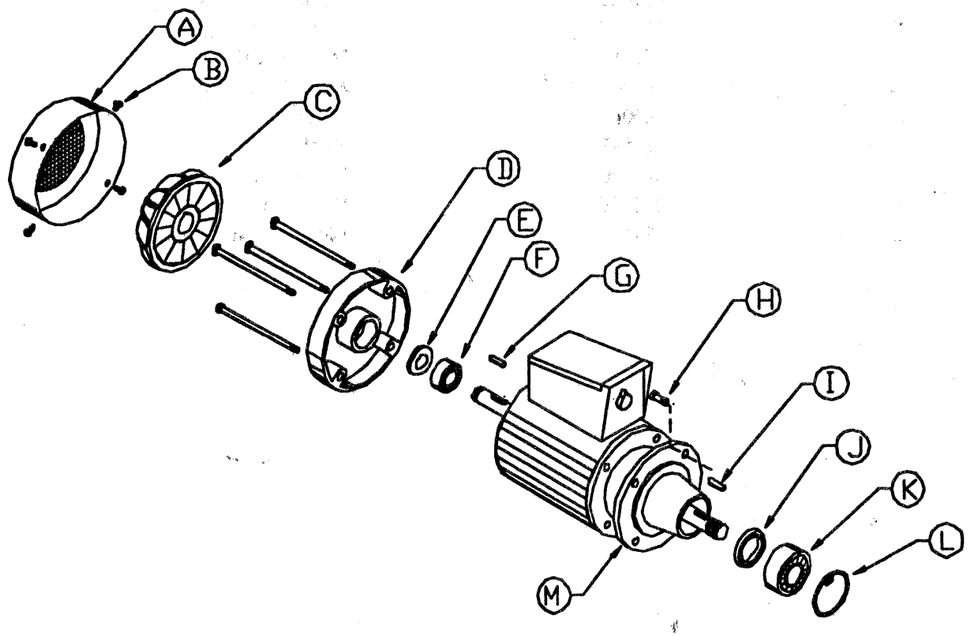


FIGURE 16

9.5 ELECTRICAL UNIT

Item	Part Number	Description
A	060060	Enclosure With Cover
B	N / A	Cover
C	073450	M-4 x 12 SHCS
D	077881	Contactor 230 Volt
DA	077882	Contactor 460 Volt
E	077867	Grounding Lug
F	077864	M-5 x 16 SHCS
G	060065	Main Switch
H	060066	Legend Plate
I	060067	Knob
J	060090	Motor Cable
K	060095	Pump Cable
L	077183	Liquid Tight Connector

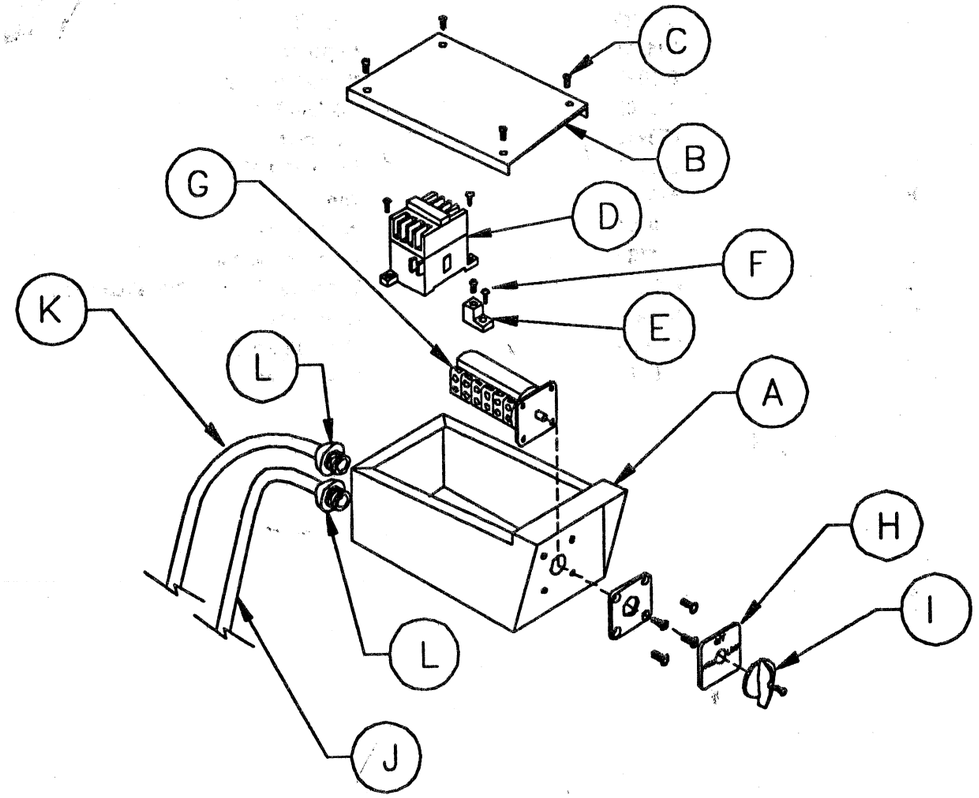


FIGURE 17

9.6 COOLANT SYSTEM AND BASE

Item	Part Number	Description
A	076846	Pump 230 Volt
AA	076847	Pump 460 Volt
B	075223	Seal Kit
C	075265	Impeller
D	075267	Pump Housing
E	073903	Coolant Line
F	073910	Suction Line
G	201110	M-6 x 12 HHCS
H	075264	Fan
I	060095	Pump Cable
J	077183	Cord Connector
K	077887	Lock-Out Switch (Not Pictured)
L	N / A	Rear Cover
M	073450	M-4 x 12 SHCS
N	060115	Base Cabinet

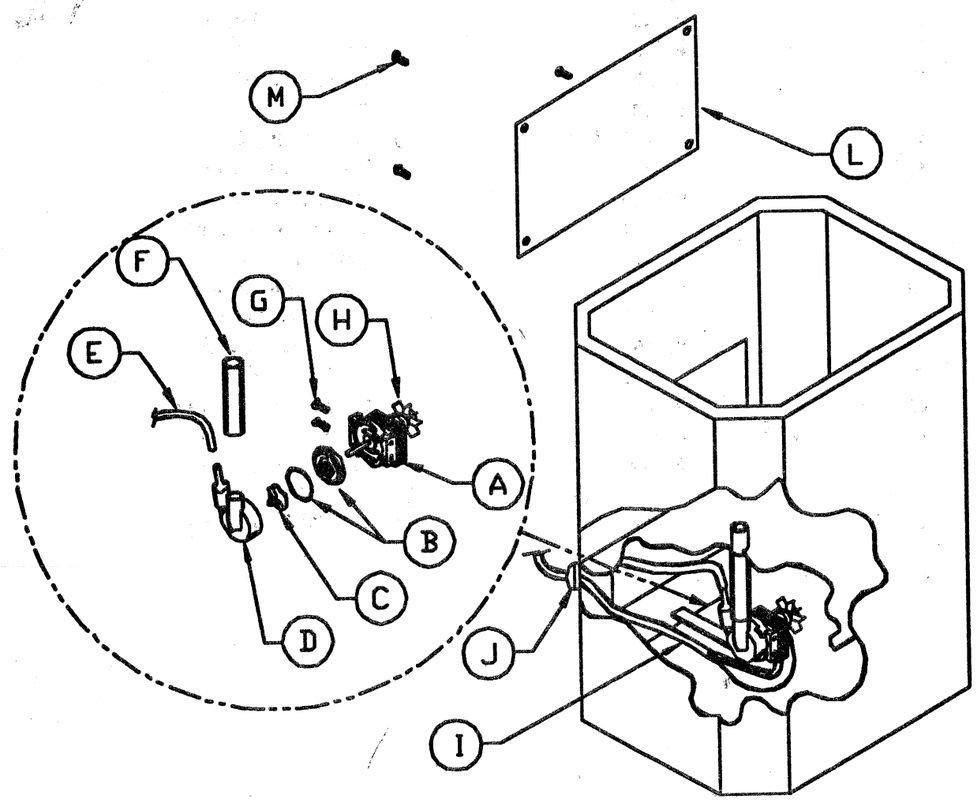


FIGURE 18

9.7 CAST BASE AND PEDESTAL

Item	Part Number	Description
A	077111	Pedestal
B	077113	Base Casting
C	221210	M-10 x 25 SHCS
D	077225	Miter Lock Mount
E	077227	Spring
F	077226	Release Handle
G	077228	Pin
H	073660	M-8 x 12 HHCS
I	073108	M-8 Lock Washer
J	073325	M-8 x 25 SHCS
K	077212	Upper Spring Mount
L	077211	Return Spring
M	077110	Adjustment Lock
N	221212	M-10 x 30 SHCS
O	073461	M-10 x 120 HHCS
P	221210	M-10 x 25 SHCS
Q	077210	Lower Spring Mount
R	077112	Sieve Screen
S	073350	M-10 x 100 HHCS
T	077115	Plastic Washer
U	077114	Complete Miter Lock

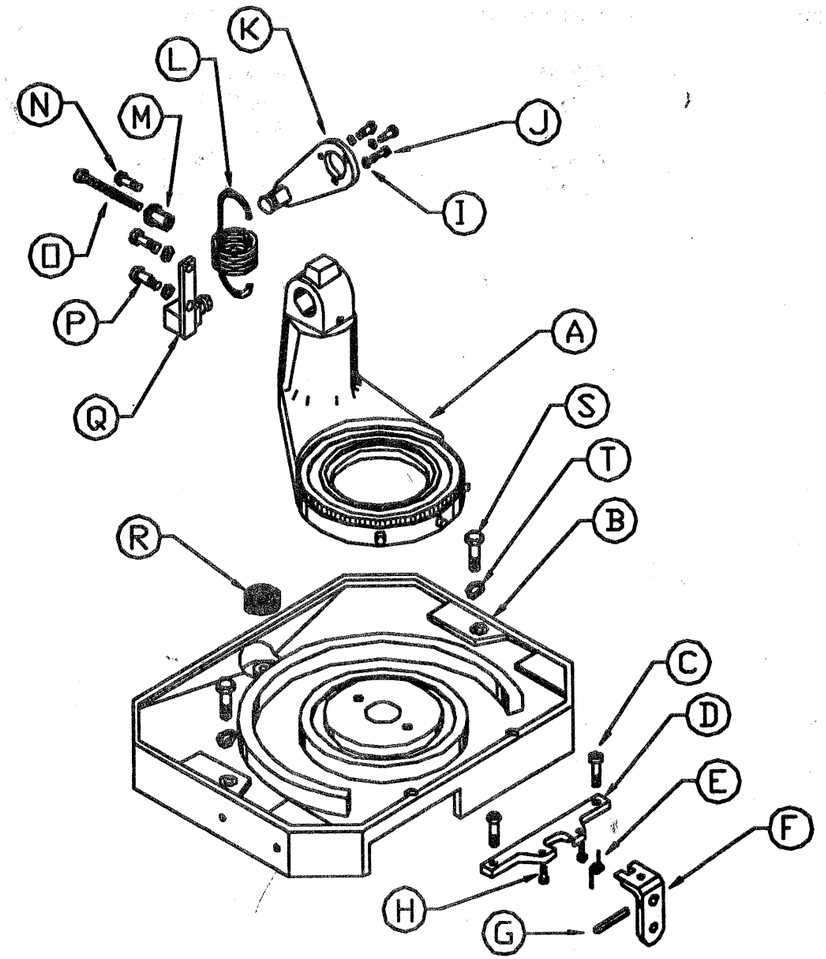


FIGURE 19

9.8 MATERIAL STOP 30 INCH (72 cm)

Item	Part Number	Description
A	060305	Stop Clamp
B	060315	Stop Shaft
C	060310	Shaft
D	073460	M-10 x 16 SHCS
E	076930	Complete Assembly

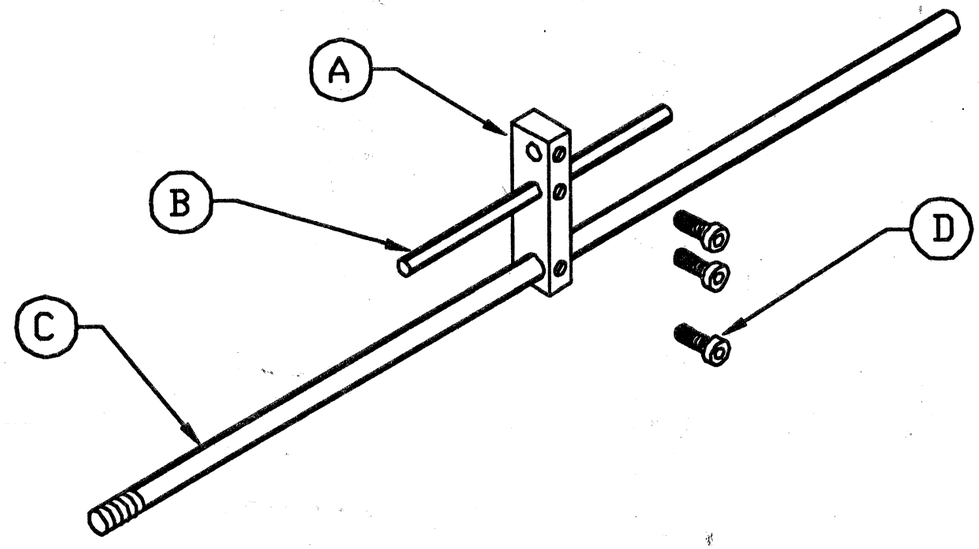


FIGURE 20

10.0 OPTIONAL EQUIPMENT PARTS LIST

10.1 POWER VISE ASSEMBLY

Item	Part Number	Description
A	077415	Acme Nut
B	077413	Cast Grip Cheeks
C	073457	M-6 x 80 SHCS
D	077422	Screw Spindle
E	060204	Cylinder Housing
F	077417	O-Ring
G	077416	O-Ring
H	077411	PIston
I	077418	Roll Pin
J	077410	Cylinder Cover
K	077419	Seal
L	077408	Roll Pin
M	077407	Hand Wheel
N	077121	M-20 Jam Nut
O	077406	Handle
P	073450	M-4 x 12 SHCS
Q	077742	1/4" Male Swivel
R	077510	5/16" Clear Tube
S	077183	Cord Connector
T	077430	Four Way Valve
U	077510	5/16" Clear Tube
V	077436	Lubricator Device
	077709	Lubricator Repair Kit
W	077442	Bowl (Arrow Brand)
	077439	Bowl (Scharder Bellows Brand)
X	073806	Gauge
Y	077707	Sight Glass
Z	077436	Regulator
AA	077719	Slide Valve
BB	077435	Complete Filter/lub. Device
CC	077431	Valve Mount
DD	073316	M-6 HHCS
EE	074415	M-4 SHCS
FF	077120	Guide Pins
GG	077412	Complete Air Cylinder
HH	076371	Cylinder Seal Kit (Includes F, G & K)
II	077878	Complete Air Vice

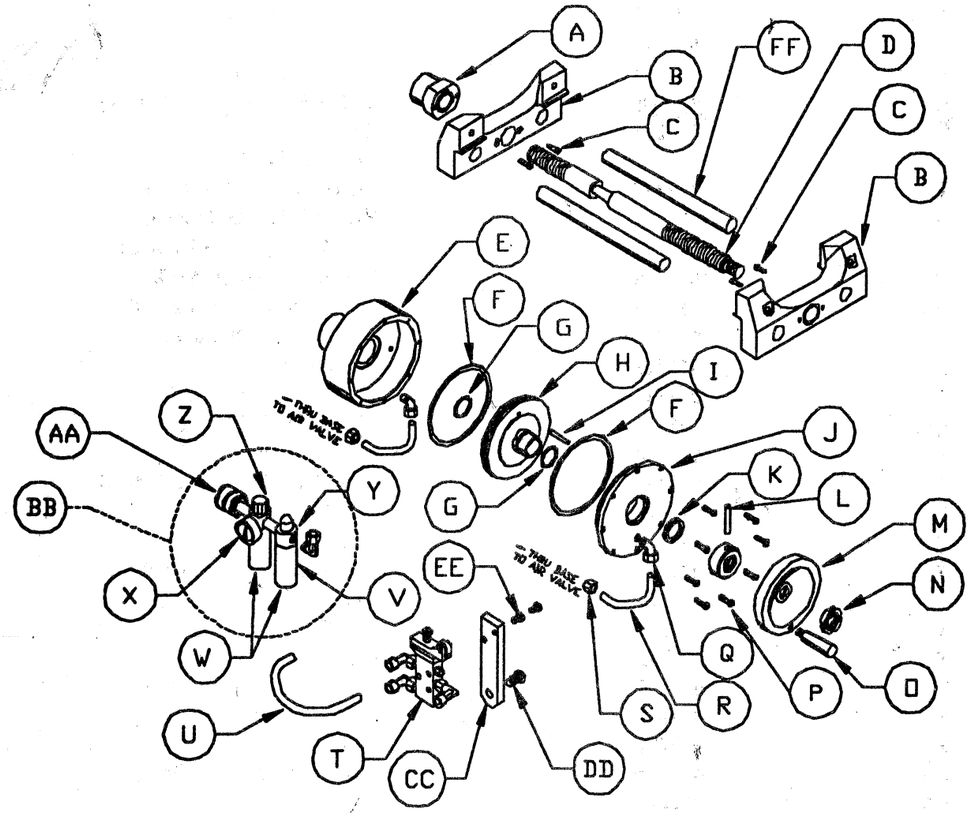


FIGURE 21

10.2 POWER DOWN FEED ASSEMBLY

Item	Part Number	Description
A	079100	Upper Arm Assembly
B	077716	Clevis
C	140415	1/2" Clevis Pin
D	123120	Cotter Pin
E	077211	Spring
F	073415	M-4 x 25 SHCS
G	077717	Stroke Adjustment Cam
H	077704	Roller Valve (Includes I)
I	077741	1/8" Male SW x 169 Plastic
J	079120	Lower Arm (Includes X)
K	077742	1/4" Male SW x 169 Plastic
L	077771	1/4 x 3/8 NPT Reducer
M	077715	Pivot Bolt
N	077746	1/4" NPT 90 Degree SW
O	077721	Line Support Bracket
P	077778	1/2" Connector
Q	077706	Cylinder (Includes K, L & N)
R	077714	Hand Knob
S	077875	Hand Knob
T	077747	3/4" x 1/2" Plastic Bushing
U	077745	1/4" NPT Tee
V	077779	1/4" Close Nipple
W	077712	Flow Control Valve
X	079135	Oil Reservoir (Includes J)
Y	077777	3/8" NPT Plug
Z	077701	Baffle
AA	077724	Stroke Adjustment Clevis
BB	210016	Jam Nut
CC	077725	Stroke Adjustment Bolt
DD	077744	1/4" x 5/16" NPT Fitting
EE	077774	3/8" NPT Close Nipple
FF	079101	Complete Power Down Feed

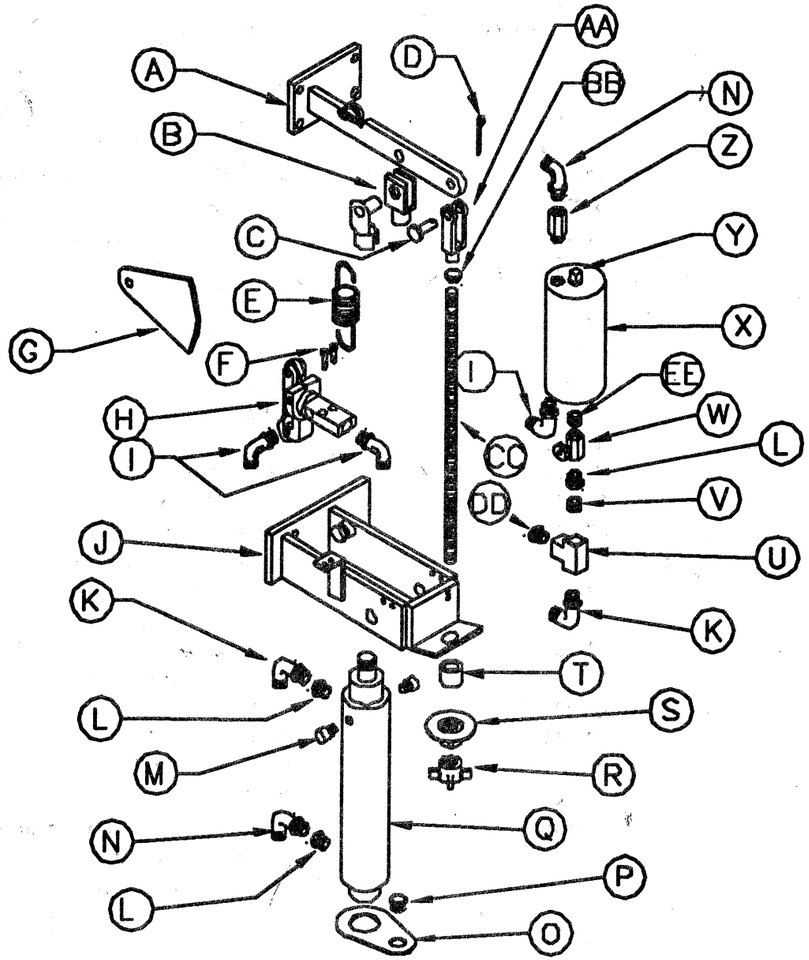


FIGURE 22

10.2A POWER DOWN FEED CONTROLS

Item	Part Number	Description
A	077718	Foot Guard
B	077702	Valve Assembly
C	077746	1/4" NPT x 169 Plastic
D	077748	1/8" NPT x 1/4" Plastic Bushing
E	077723	1/4" Breather
F	077746	1/4" NPT x 1/4" Plastic
G	077779	1/4" Close Nipple
H	077427	Filter Reg. Mount
I	077703	Valve Assembly
J	077752	Auto Return Pin
K	077719	SL-20 Shuttle Valve
L	077436	Filter Regulator
M	073806	Gauge
N	077437	Lubricator
O	077739	1/4" NPT Cross
P	077722	1/8" Breather
Q	073760	5/8" Clear Plastic Loom
R	077874	1/4" Blue Tube
S	073756	1/4" Clear Tube
T	073757	1/4" Red Tube
U	073758	1/4" Green Tube
V	077778	1/2" Straight Connector
W	073415	M-4 x 25 SHCS
X	073450	M-4 x 12 SHCS
Y	077442	Bowl
Z	077435 77543	Filter / Regulator / Lubricator Assembly Includes (L, M & N)
AA	077743	1/8" NPT x 1/4 Plastic

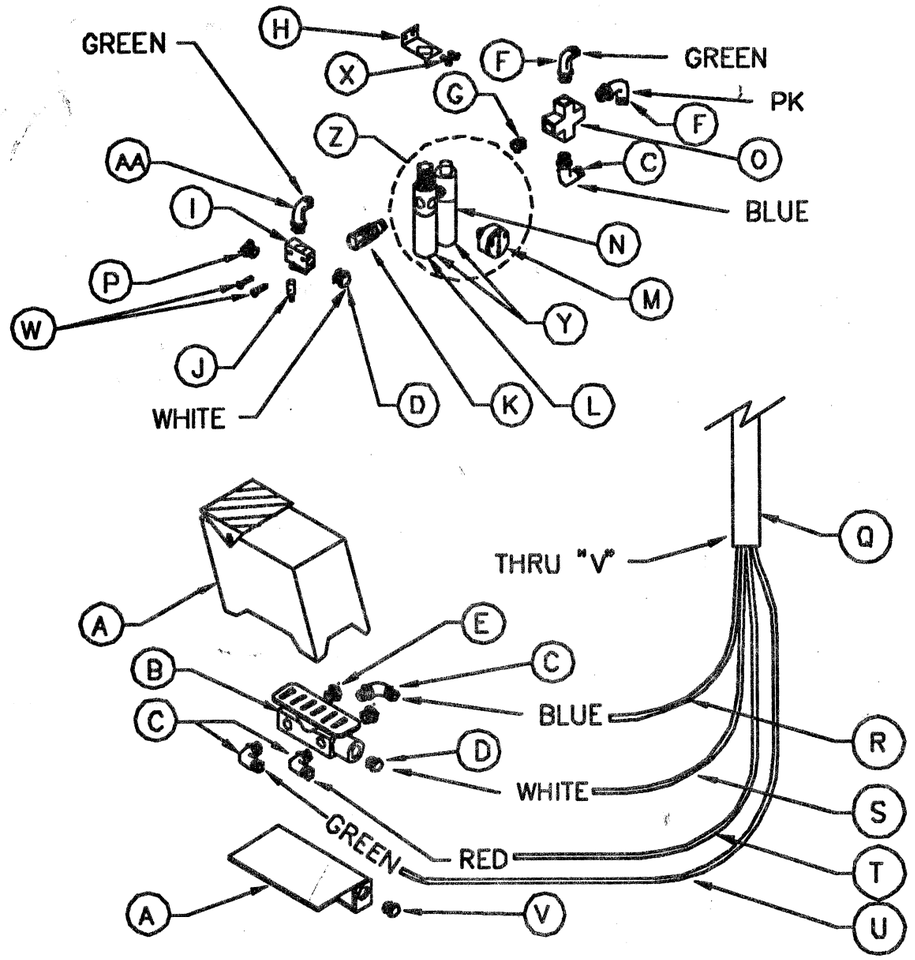


FIGURE 23

10.3 TEN FOOT (304 CM) SUPPLY TRACK

Item	Part Number	Description
A	201105	M-6 x 8 HHCS
B	076965	Roller Mounts
C	076963	Roller
D	076934	Rail Assembly
E	076953	Leg
F	201235	M-10 x 80 HHCS
G	208012	M-10 Hex Nut
H	076961	Mounting Support
I	212012	M-10 Lock Washer
J	203212	M-10 x 30 HHCS
K	076920	Complete Supply Track

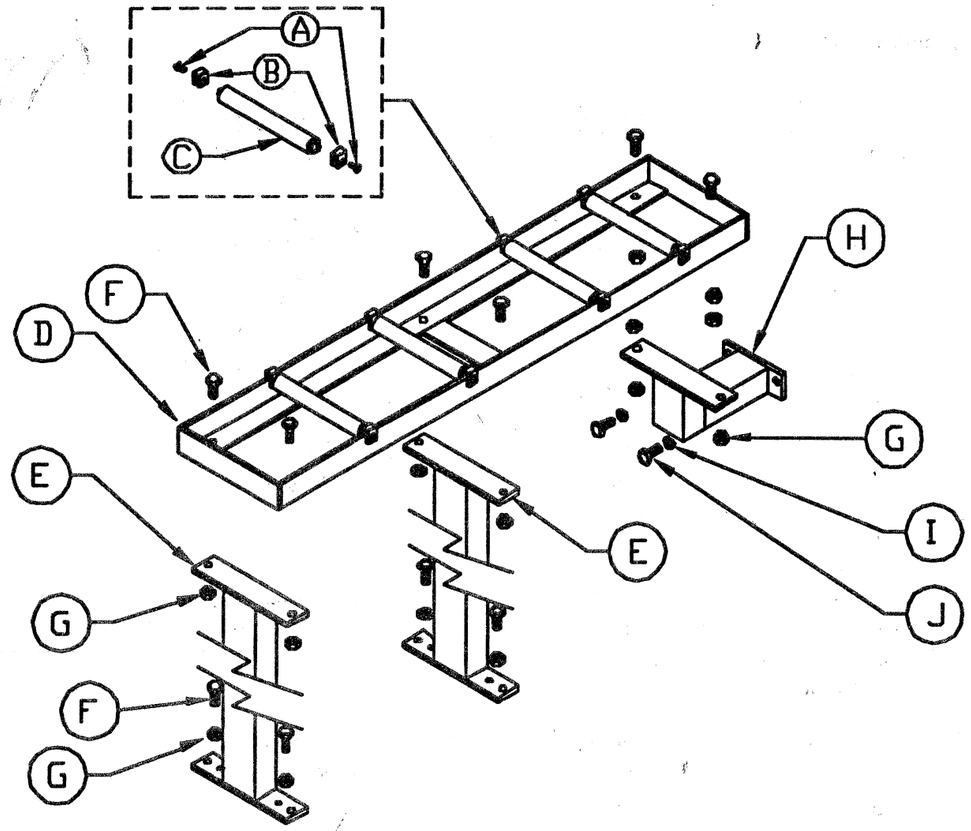


FIGURE 24

10.4 DISCHARGE TRACKS 40, 80, AND 120 INCH (101, 202, & 303 CM)

Item	Part Number	Description
Common Parts		
B	203212	M-10 x 30 HHCS
C	208012	M-10 Hex Nut
D	201235	M-10 x 80 HHCS
E	079029	Scale Mounting Block
G	230207	M-10 x 20 FSHCS
J	212012	M-10 Lock Washer
K	076953	Leg
L	201235	M-10 x 80
M	079023	Reading Block
N	218010	M-5 x 10 HHCS
O	079025	Pin
P	090400	Knob
Q	079015	Slider Block
R	079013	Stop Strip
S	079017	Aux. Stop Strip
T	203212	M-10 x 30 HHCS
U	076963	Roller
V	076965	Roller Mount
W	201105	M-6 x 8 SS
40" Track		
A	079005	Rail Assembly
F	079031	Scale Rail
H	079033	Ruler
80" Track		
A	079055	Rail Assembly
F	079053	Scale Rail
H	079033 & 079041	Ruler
120" Track		
A	079045	Rail Assembly
F	079043	Scale Rail
H	079033 & 079041	Ruler

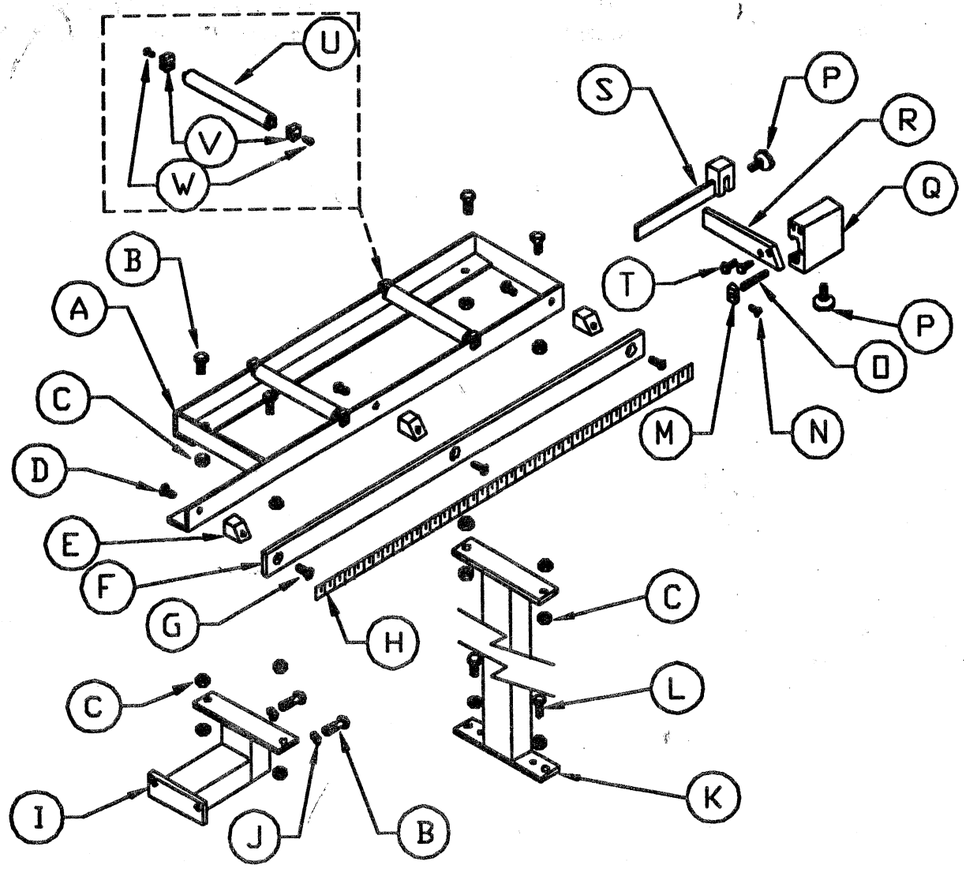


FIGURE 25

10.5 PHASE CONVERTERS

Item	Part Number	Description
A	075252	Pam 200 HD For 30-60 RPM
B	075253	Pam 300 HD For 60-120 RPM

10.6 COOLANTS AND LUBRICANTS

Unit	Part Number	Description
1 Gal.	075751	Synthetic Coolant
5 Gal.	075752	Synthetic Coolant
55 Gal.	075754	Synthetic Coolant
1 Gal.	075756	Special Mix Coolant
5 Gal.	075757	Special Mix Coolant
1 Qt.	075753	Air Line Lubricant
1 Gal.	075759	Air Line Lubricant
1 Gal.	075758	Gear Lubricant 80-90 Wt.

10.7 LOCK - OUT / DISCONNECT SWITCH

Item	Part Number	Description
A	563025	Disconnect Switch
B	562250	Mounting Plate
C	030365	Cord
D	004360	Wire Bushing
E	108010	1/4" Hex Nut
F	158200	Grommet
G	224205	M-10 WLCS
H	114010	1/4" Washer

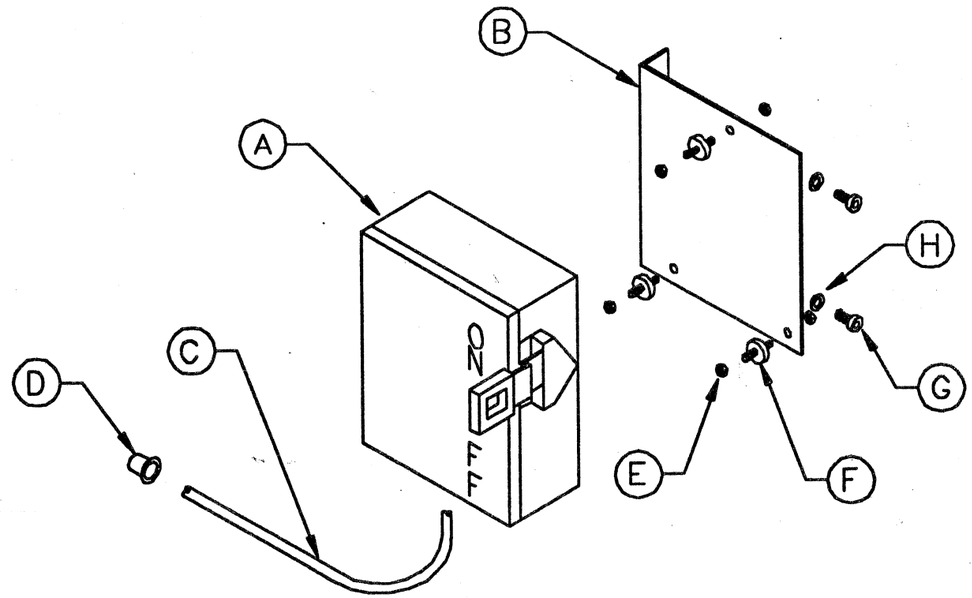


FIGURE 26

11.0 STOCK BLADES

Item	Part Number	Description
A	074300	90 Tooth 10 Inch (250 mm) Dia.
B	074304	100 Tooth 10 Inch (250 mm) Dia.
C	074302	120 Tooth 10 Inch (250 mm) Dia.
D	074306	150 Tooth 10 Inch (250 mm) Dia.
E	074305	180 Tooth 10 Inch (250 mm) Dia.
F	074307	240 Tooth 10 Inch (250 mm) Dia.

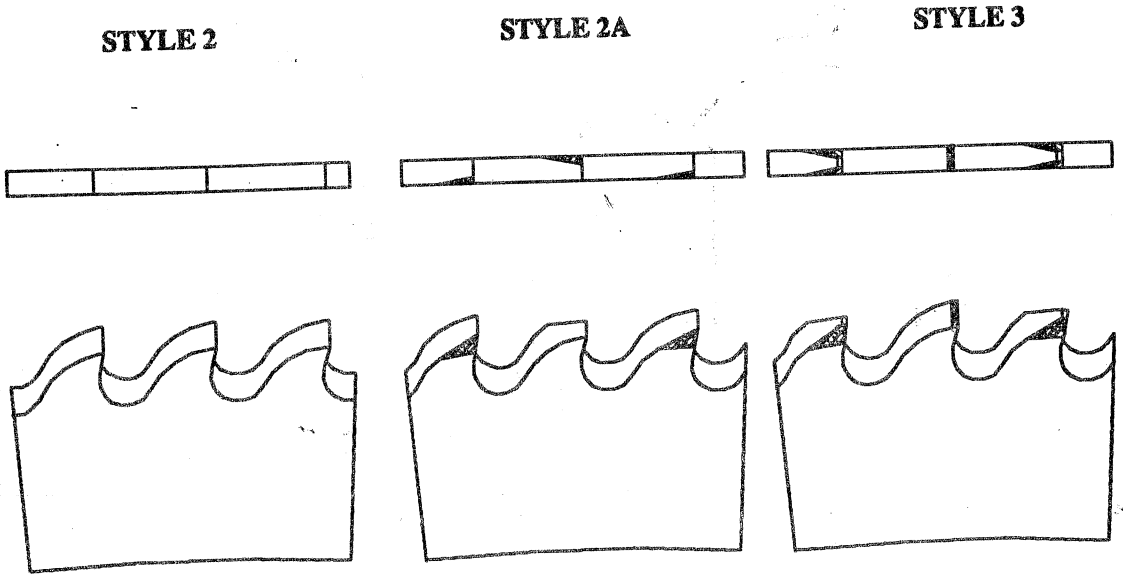


FIGURE 27

There are three styles of blades available :

STYLE 2 : Has a round back tooth with a square face and top. This style is designed for thin wall non-ferrous tubes, plastics and synthetics.

STYLE 2A : Is an alternate top bevel grind. This grind is used on blades that have 240 teeth or more. Applications for this style are thin wall tubes, profiles with thin cross sections and non-ferrous applications that require 240 teeth or more.

STYLE 3 : Is a triple chip grind with a high / low tooth form. This grind is used on blades that have 220 teeth or less. This style is used for a wide range of materials from solid sections of non-ferrous materials to heavy wall tubes and solid sections of steel and alloys.

The stock blades listed above are oxide coated high speed steel. Ten inch (250 mm) blades can be provided with any number of teeth from 50 to 280.