



INSTRUCTIONS AND REPAIR PARTS MANUAL



IRONWORKERS • PRESS BRAKES • SHEARS • BENDING ROLLS

PIRANHA

IRONWORKER MODEL NO. PII65/88

Publication December, 2004



www.piranhafab.com
800-338-5471

Be sure to register your
model and serial number to
receive Piranha Service
and Product Updates.

FOREWORD

This manual has been prepared for those persons who will operate and maintain the Piranha. It is important that all persons responsible for the care and operation of this equipment read and understand the information presented in this publication.

The illustrations and instructions on the following pages were the most recent available at the time of publication and selection of this material was made on the basis of a standard unit arrangement. Differences between the unit you received and the views contained in this manual are the result of design improvement and/or the addition of optional accessories specified on your order.

WARRANTY

Mega Mfg. will replace F.O.B. the factory, or refund the purchase price for any goods which are defective in materials and workmanship within 12 months of date of purchase, provided the buyer returns the warranty registration card within thirty (30) days of purchase date, and, at the seller's option, returns the defective materials freight and delivery prepaid to the seller, which shall be the buyer's sole remedy for defective materials. Seller shall not be liable to purchaser or any other person for consequential or incidental damages. Hydraulic and electrical components are subject to their respective manufacturer's warranties. This warranty does not apply to machines and/or components which have been altered in any way, or subjected to abusive or abnormal use, inadequate maintenance and lubrication, or to use beyond seller recommended capacities and specifications. Seller shall not be liable under any circumstances 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 employee, agent, officer or seller is authorized to make oral representations or warranty of fitness or to waive any of the foregoing terms of sale and none shall be binding on the seller.

SAFETY PRECAUTIONS

The operator of this machine should view the operational video provided with the machine, and thoroughly understand this manual before starting any operation.

Wear eye protection at all times.

Use the proper voltage outlet for your machine.

Assure that all guards and cover shields are down before starting machine.

CAUTION: Do not remove guards.

Keep hands off working tables and out of path of moving parts during operation.

Remove all material from the tables except what you are using.

Remove all tooling from shear section before starting coping operations or from coping end before starting shearing operations.

Assure all tooling is properly held in position before starting any operation.

The area around the machine should be well lighted, dry, and as free as possible from obstructions.

All maintenance and repair work should be performed by a person familiar with this publication.

At the end of the working day, the operator should turn the power off to the machine.

Adjust the punch stripper when punching to allow ¼" maximum clearance between bottom of stripper foot and top of the material. Adjust the limit switch when bending to allow ¼" maximum clearance between the bending punch and the top of the material. Contact the factory for limit switch adjustments on special tooling.

Turn the machine OFF when changing tooling or performing maintenance work.

INTRODUCTION

The Piranha Ironworker is a compact hydraulic powered unit that provides you several important advantages surpassing most other ironworkers in today's market, and offering, for your shop, a one stop ironworking center. It shears, punches, bends, notches, and copes; all in a low silhouette, efficiently designed unit resulting in minimal floor space requirements. The integral lifting lug provides instant portability and the unit arrives fully assembled at your shop requiring only the addition of hydraulic oil and a power source to become fully operational. The large platen has thirty tapped holes giving a wide base for increased flexibility of attachment sizes. The shearing operation features an adjustable automatic hold down allowing the operator to clamp the work piece with a slight initial adjustment. All work stations are located approximately 41" off the floor for ease of operation.

The first part of this manual provides maintenance instructions including an introduction, dimension and function drawings, lubrication instructions and a section on trouble shooting various problems which may occur. The second part of this manual provides repair parts information and a complete list of parts and their respective part numbers.

Proper understanding and application of the information and procedures given in this manual will aid in establishing a preventative maintenance program and provide assistance for correcting malfunctions that may occur in the machine. The repair parts list provides information for parts procurement and assembly breakdowns to aid in disassembly and assembly for repair part installation.

MACHINE SPECIFICATIONS

HYDRAULIC SYSTEM

Drive Motor 10 HP 230/460 volt 3 phase
Hydraulic Tank Capacity 18 gallons
Hydraulic Oil Mobile DTE 13 or Equivalent
ISO Grade 32 – Consult Your
Local Distributor For Cross
Reference.

WORKING SURFACE

Platen 11" x 38"
Coping 15" x 15"

PH65 CAPACITIES

Punch Maximum 1 1/16" thru 3/4" thick material or 65 tons.
Bending Maximum 65 Tons.
Punch End Maximum 65 Tons.
Bar 1 1/2" Round or 1" Square.
Plate 3/4" X 8" or 5/8" X 12" or 1/2" X 24"
Angle 5" X 5" X 3/8" or 4" X 4" X 1" w/ Optional Knife
Coper – Notcher 2 3/4" X 4" X 1/4"

WEIGHT

Shipping Weight 4,000 lbs.

PH88 CAPACITIES

Punch Maximum 1 1/16" thru 1" thick material or 88 tons.
Bending Maximum 88 tons.
Punch End Maximum 88 tons.
Bar 1 1/2" Round or 1" Square.
Plate 3/4" X 8" or 5/8" X 12" or 1/2" X 24"
Angle 5" X 5" X 3/8" or 4" X 4" X 1/2" w/ Optional Knife
Coper – Notcher 2 3/4" X 4" X 1/4"

WEIGHT

Shipping Weight 4,700 lbs.

INSTALLATION

LOCATION

For the best overall performance, install the Piranha in a location which is clean and well lighted. Provide sufficient space in all directions to allow for material lengths of the workpieces to be processed by the Piranha.

FOUNDATION

To maintain the accurate alignment built into the Piranha and to prevent undue stress on the moving parts under load, the Piranha should be placed on a stable base or floor adequately constructed to withstand the unit weight. Use the leveling bolts provided.

WIRING

The Piranha is shipped totally wired through the electrical enclosure box. It has been left to the owner's discretion whether to wire direct to a disconnect or to install a cord and plug for mobility of the Piranha. CAUTION: Compare machine wiring to input voltage prior to connecting power.

LIFTING

The lifting lug on the Piranha is an integral part of the machine. Use a device with adequate lifting capacity to handle the Piranha. CAUTION: Unit is extremely top heavy!!! Lifting from the underside of the machine may cause damage to the cabinet structure.

ASSEMBLY

The Piranha is pre-assembled at the factory requiring only the addition of hydraulic oil and a power source.

MAINTENANCE

NOTE: The machine should be shut OFF while maintenance checks are being performed.

HYDRAULIC FILTER ELEMENT

The hydraulic oil filter is a vital component of the hydraulic system as it filters impurities and foreign particles to avoid hydraulic component malfunctions. **CAUTION:** When the filter element is plugged, hydraulic fluid will by-pass the element allowing contamination to enter the hydraulic system. It is recommended that the filter element be changed every 3 months, depending on work load and enviromental conditions. One extra element is furnished with the basic unit. This element should be installed after the first 40 hours of use. The filter housing is mounted inside the access door on the machine. See repair parts list for reordering instructions and part number for replacement filter(s).

FASTENERS AND CONNECTIONS

The efficiency and accuracy of the Piranha is dependent upon proper alignment of all parts. Alignment can only be achieved by keeping the fasteners tight. Check all bolts and nuts for tightness every 40 hours of operation or when lubricating the machine. Unless specified in parts illustrations, torque socket head bolts and hinge pin jam nuts to the specifications in the provided table.

Check all hydraulic hose and fitting connections for tightness when lubricating the machine. Use of Loctite hydraulic sealant or equivalent is recommended on all connectors.

NOTE: Tighten the cylinder tie bolts after the first 40 hours of use.

Check to insure the hydraulic cylinder clevis is screwed tight on the piston rod each time machine is lubricated.

HYDRAULIC OIL LEVEL

The Piranha is equipped with a dipstick indicator on the fill cap located inside the tank door. The dipstick is marked to help maintain proper fluid level. This should be checked as part of your normal maintenance cycle.

NOTE: It is recommended to implement a weekly maintenance program to inspect and lubricate your Piranha. A service record chart is provided in the back of this manual.

MEGA Manufacturing, Inc.

Electrical System Design/Manufacture:

The machines manufactured in Hutchinson, KS, are furnished with electrical/electronic products that are UL (Underwriter's Laboratory) approved. These components have the UL numbers printed or stamped on them and can be easily traced to the point of manufacture. In addition, all of the machines meet the current "Ontario Hydro" electrical code for proper manufacture of the electrical circuits.

Hydraulic System Design/Manufacture:

Hydraulic components used in Piranha machines are approved by NFPA (National Fluid Power Association), and those approval numbers can be traced through the manufacturer's part numbers.

ANSI/OSHA Compliance:

Mega Manufacturing meets the current ANSI construction standards for manufacturing of ironworkers, press brakes, and shears:

ANSI B11.5—Ironworkers, Construction, Care, and Use

ANSI B11.3—Power press brakes, Construction, Care, and Use

ANSI B11.4—Shears, Construction, Care, and Use

The ANSI B11 standards were developed to establish levels of responsibility for manufacturing safe products, installation, training, and use of these products. The levels of responsibility are fairly evenly distributed between the manufacturer, the owner/end user of the equipment, and the operator. Specific guarding requirements are in general assigned to the owner/end user of the equipment.

With specific reference to Ironworkers, OSHA (Occupational Safety and Health Administration) made a ruling on March 4th of 1991 under their standard number 1910.212, specific to the OSHA machine guarding standard 29 CFR 1910.212(a)(1). This ruling is stated verbatim below:

"If an employer provides an iron worker machine (at his or her workplace), which is manufactured in compliance with the safety requirements specified in ANSI B11.5-1988, and the guarding is maintained as required; then that employer meets OSHA's machine guarding requirements for that machine."

Please understand that this ruling places the primary burden of responsibility for maintenance of guarding on the owner/end user of the equipment. Inherent in this requirement is the responsibility of the owner/end user of the equipment to develop and maintain guarding specific to their application for the equipment. These ANSI safety requirements may be acquired from:

American National Standard Institute

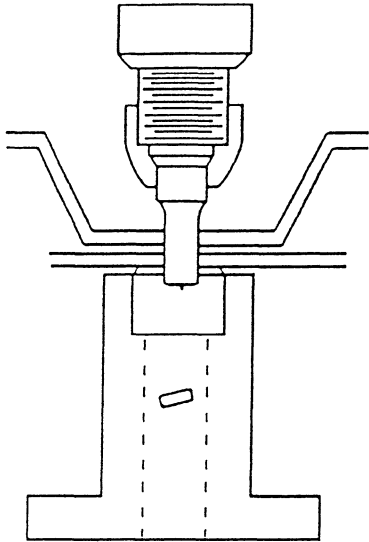
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New York, New York 10018

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Hutchinson, KS 67504-0457
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TONS OF PRESSURE REQUIRED FOR PUNCHING MILD STEEL



This table shows the tons of pressure required for single punching mild steel derived by the formula: Tons of pressure required = hole size x material thickness x constant 80. All figures shown are tons.

Tonnage for punch sizes over 1" round can also be computed:

Example: What pressure is required to punch a 2 ¼" round hole in 7/8" thick material? Since a 1" round hole in 7/8" thick material requires 70 tons of pressure, a 2 ¼" round hole in 7/8" thick material requires 157.50 tons.

$$2.25 \text{ round hole} \times 70 \text{ tons} = 157.50 \text{ tons.}$$

NOTE: Do not punch a hole with a smaller diameter than the thickness of the material.

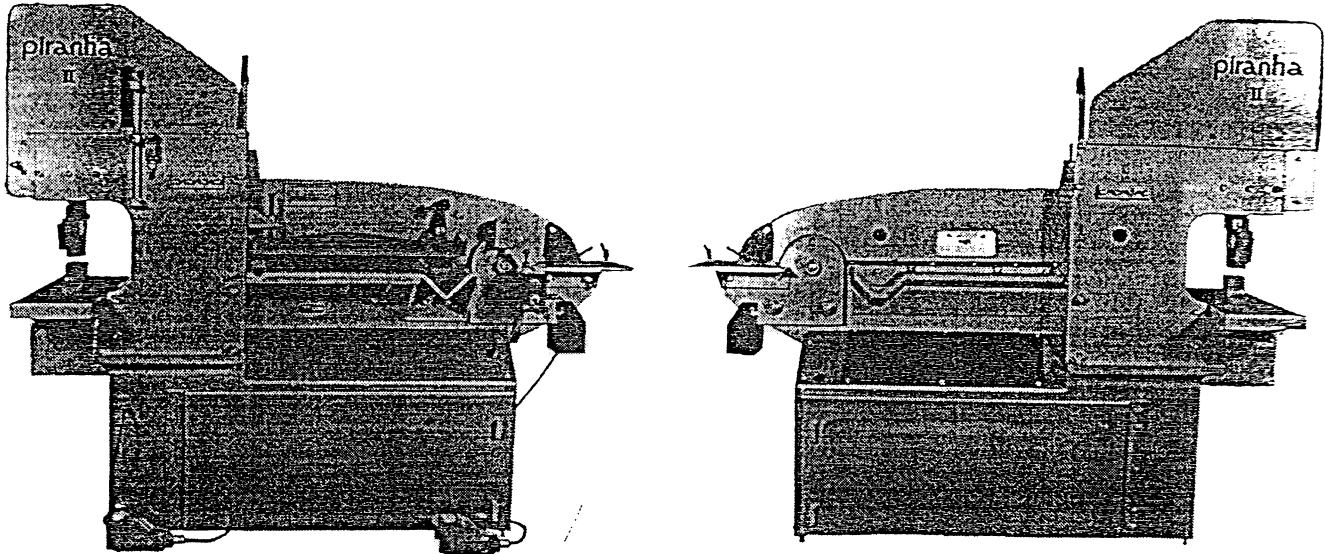
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LUBRICATION

GENERAL

The importance of correct lubrication cannot be over emphasized. Under no circumstances should the machine be operated without complying with the lubrication requirements set forth in this publication.

LUBRICATION DIAGRAM



LUBRICATION CHART

Station	Part Lubricated	Frequency	Instructions	Type Lube
1	Trunion Pin - On Side	Every 40 Hours or Weekly with Normal use	Apply Grease Gun Until Grease Appears Around Edge of Parts	Mobile MF or Any Multi- Purpose Grease
12	Trunion Pin - Off Side			
2	Gib - On Side			
11	Gib - Off Side			
8	Coper Side Plate-On Side (2 Places)			
10	Coper Side Plate-Off Side (2 Places)			
7	Angle Guide Pins (2 Places)			
4	Hold Down Shaft			
5	Angle Knife Bushing			
6	Hold Down Link			
3	Cylinder Clevis			
15	Hold Down Pin - Off Side			
9	Rear Hinge Pin			
13	Drive Motor <u>Located Inside</u>	Every 100-150 Operating Hours	One shot from Grease Gun	Multi- Purpose Grease
14	Drive Motor <u>The Cabinet</u>			

TOOL LIST

The following tool list is only to be used as a guideline for performing maintenance and to assist you in trouble shooting your machine. Many of these items would already be included in your stockroom or a maintenance personnel tool box.

1. Grease gun with a flexible connection.
2. Open end wrenches – 3/4" thru 1 1/4".
3. Adjustable wrench – 1 1/2" thru 2 1/4" opening.
4. Allen wrenches – 3/16" thru 5/8".
5. Screwdrivers – miscellaneous sizes.
6. Voltmeter

RECOMMENDED FASTENER TORQUE SPECIFICATIONS

(Unless Otherwise Specified)

Bolt Size	Torque (Ft-Lbs)
3/8/16	45
7/16/14	70
1/2/13	100
5/8/11	210
3/4/10	375
Jam Nut	600

PUNCH & DIE CHART

CLEARANCE CHART FOR STEEL

Gauge	Approx. Thickness	Clearance Add to Punch Size	Gauge	Approx Thickness	Clearance Add to Punch Size
30	0.012	Slip fit	17	0.0538	0.005
29	0.0135	Slip fit	16	0.0598	0.005
28	0.0149	Slip fit	15	0.0673	0.007
27	0.0164	Slip fit	14	0.0747	0.007
26	0.0179	Slip fit	13	0.0897	0.01
25	0.0209	0.002	12	0.1046	0.01
24	0.0239	0.002	11	0.1196	0.01
23	0.0269	0.002	10	0.1345	1/64"
22	0.0299	0.003	9	0.1345	1/64"
21	0.0329	0.003	8	0.1644	1/64"
20	0.0359	0.003	7	0.1793	1/64"
19	0.0418	0.003	1/4 to 1/2" plate		1/32"
18	0.0478	0.005	1/2" plate and over		1/16"

OPERATING INSTRUCTIONS

The Piranha ironworker comes pre-assembled and pre-wired, requiring only the addition of a power source from a disconnect to the electrical enclosure box located inside the cabinet. The Punch and Shear/Coper work stations on dual operator Piranha models can operate independently of each other. The dual operation design allows for one operator on the punch end and a second on the shear/coper end. Never allow two (2) operators to use the Shear/Coper station at the same time or never exceed the rated capacities of the machine.

The unit can be started and stopped by the push-pull button switches located at the upper front of the machine and the rear control box. Pull to start the machine, push to stop the machine. Both switches must be pulled out to start the machine. Either switch will stop the machine by pushing it in. Note: Proper positioning of the foot control ON/OFF selector switch and JOG/RUN selector switch located at the punch end controls is required upon startup. The ON/OFF should be in the "off" position, the JOG/RUN in the "jog" position.

The ironworker is hand controlled by a 3 position momentary joystick operator. When the joystick is released from any position, it will return to the neutral (center) position stopping the machine movement instantly. The joysticks are located at the upper right side of the punch end (facing machine) and at the rear control box near coper notcher area (material feed side).

The 2 controlling positions of the joystick are:

Punch end

1. Up (pushing the handle up)
2. Down (pulling the handle down)

Rear control box (with JOG/RUN selector switch at punch controls area in "run" position)

1. Shear section Up (pushing the handle to the Shear/Coper end)
2. Shear section Down (pulling the handle to the Punch end)

The ironworker can also be controlled by a remote foot control. (see figure "F") The remote foot control is used by plugging the 4-pole plug into the 4-pole receptacle located at the lower front of the machine (Punch end) and at the rear control box (Shear/Coper end). It works in conjunction with the ON/OFF selector switch located on the upper front of the machine (Punch end), and at the rear control box (Shear/Coper end). The remote foot control is a three position switch allowing hands free operation. By fully depressing the remote foot control lever, ram movement is downward until the stroke limit setting is met (see "F2") or by allowing the remote foot control lever to elevate to the center position, ram movement will stop (see "F3"). Completion of the downward cycle is accomplished by depressing the remote foot control lever again. The ram will move down until the stroke limit setting is met (see "F4"). Removing foot pressure from the foot control entirely allows the ram to move upward until the stroke limit setting is met, completing the upstroke cycle (see "F5").

PUNCH END OPERATION

To set the punch stroke, use the following procedure:

1. Turn the remote foot control ON/OFF selector switch to the "off" position.
2. Turn the JOG/RUN selector switch to the "jog" position.
3. Plug in the remote foot control.
4. Activate the punch end joystick (pull downward) to lower the ram to the desired "down" setting.
5. Move the top limit switch button to make contact with the limit switch and stop the ram at the desired "down" position.
6. Activate the punch end joystick (pull upward) to raise the ram to the desired "up" setting.
7. Move the lower limit switch button to make contact with the limit switch and stop the ram at the desired "up" position.
8. Turn the JOG/RUN selector switch to the "run" position.
9. Turn the remote foot control ON/OFF selector switch to the "on" position.
10. Fully depress the remote foot control lever allowing the ram to lower.
11. Allow the remote foot control lever to elevate, raising the ram.

NOTE: When punching, bending, or using any attachment on the punch end of the machine, the upper and lower limit settings should allow for 1/4" maximum clearance between the bottom of the upper tooling and the work material. The setting will change when the work material thickness changes.

Allowing the upper tooling to raise into the machine "C" frame area due to an incorrect stroke limit control setting, can damage the tooling and/or the machine. Always check the stroke limit settings before installing tooling.

PUNCH ATTACHMENT ALIGNMENT

The alignment of the punch and die should be accomplished in the following manner:

1. Turn the machine off.
2. Locate the slotted mounting hole on the stripper. Loosen the nut on the stripper stud and rotate the stripper out of the way.
3. Remove the coupling nut from the punch stem using the coupling wrench.
4. Insert the punch into the coupling nut and tighten onto the punch stem using the coupling wrench.
5. Insert the die into the die block. Tighten the set screw against the die. Be sure the die ID is larger than the punch OD by at least 10% of the material thickness.
6. Slide the die block around the set screws on the platen table. Do not tighten the flanged nuts.
7. Start the machine and plug the remote foot control in. With the remote foot control ON/OFF selector switch in the "off" position, and the JOG/RUN selector switch in the "jog" position, lower the ram using the punch end joystick. Stop the ram movement when the punch is approximately 1/8" above the die.

8. Visually and by hand movement of the die block, align the punch and die. Move the ram down again until the punch has passed through into the die, 1/8" maximum.
9. Tighten the flanged nuts on the set screws to secure the die block firmly to the platen table.
10. Set the limit switch buttons to control the length of the stroke "up" and "down" (see procedure previously listed in Punch End operation)
11. Turn the JOG/RUN selector switch to the "run" position.
12. Turn the remote foot control ON/Off selector switch to the "on" position.
13. Depress the remote foot control lever allowing ram to lower to "down" setting.
14. Allow the remote foot control lever to elevate allowing the ram to raise to the "up" setting.
15. Rotate the stripper back into position and adjust, using the nuts on the stripper studs, to a maximum distance of 1/4" above the work material.
16. Recheck the "up" and "down" stroke settings to make sure the punch coupling nut will not come in contact with the bottom of the material stripper. If the coupling nut does contact the bottom of the stripper foot, adjust the stripper assembly up, using the stripper stud nuts, and reset the lower limit setting.
17. Start operation.

SHEAR END OPERATION

The shearing section of the Piranha contains workstations to shear round or square bar, flat bar and ~~and~~ iron. It can be operated with either the joystick or remote foot control from the REAR CONTROL BOX ~~box~~. The foot control is used in conjunction with the upstroke and downstroke limit switches located near the rear control box. On the backside of the rear control box is the ON/OFF selector switch for activating ~~the~~ limit switches. The front limit adjusting screw (closest to the punch end) controls the beam's ~~upper~~ upward movement. The back adjusting screw (furthest from the punch end) controls the beam's downward movement. Adjust each limit switch setting by loosening the lock nut and adjusting the knurled screw to obtain ~~the~~ desired stroke. To set the beam stroke for shearing flat, angle, and round bar using the limit switch stops ~~as~~ the following procedure:

1. Plug in footswitch at rear control box.
2. Turn the JOG/RUN selector switch to the "run" position.
3. Turn OFF/ON selector switch to "on" position.
4. Turn SHEAR/COPER selector switch to "shear" position.
5. Loosen the downstroke limit stop locking nut and turn the knurled screw to the desired setting.
6. Fully depress footswitch lever allowing beam to move downward.
7. Adjust limit switch stop until contact with the beam downstroke switch stops beam movement at the desired lower limit.
8. Tighten locking nut to hold limit switch stop firmly in place.
9. Loosen the upstroke limit stop locking nut and turn the knurled screw to the desired setting.
10. Allow footswitch lever to elevate allowing beam to raise.
11. Adjust upstroke limit switch stop until contact with the beam upstroke switch stops beam movement at the desired upper limit.
12. Tighten locking nut to hold limit switch stop firmly in place.
13. Start operation.

To set the beam stroke for the coper/notcher section, follow the same procedure as above except in number 3. Turn the SHEAR/COPER selector switch to "coper" position.

NOTE: The limit switch closest to the punch end controls the downstroke limit on the copier end. The upstroke on the copier end is controlled by the limit switch closest to the copier end.

HOLD DOWN ASSEMBLY ADJUSTMENT

The adjustment on the hold down assembly should be accomplished by the following manner:

1. Raise the upper beam to its full upstroke limit.
2. Loosen the long hex head nut without removing it from the swing raising the holddown assembly.
3. Assure the hold down bar has raised until it is directly under the long nut.
4. Insert material to be sheared under the hold down assembly.
5. Tighten the long hex head nut to allow for approximately 1/8" clearance between the bottom of the shear urethane and the top of the material to be sheared. The material should move freely and not be held by the hold down assembly at this point.
6. Lower the beam using the rear control box joystick until the hold down assembly firmly clamps the material. Note: The hold down assembly must firmly clamp the material before the shear knives engage the material surface.
7. If the foot switch is to be used during the operation, adjust the limit switches to control the length of stroke (see procedures previously listed).

NOTE: Do Not Attempt to shear any material that will not be held by the hold down assembly.

3 Position Holddown Settings vs Material thickness:

Locator hole nearest punch end – Plate = 1/4" thick and less, Angle = 3/16" thick and less

Locator hole center position – Plate = 5/16" to 1/2" thick, Angle = 1/4" to 5/16" thick

Locator hole nearest the copier end – Plate = 5/8" to 1" thick, Angle = 3/8" to 1/2" thick

BENDING ATTACHMENT ALIGNMENT

The alignment of the bending punch and bending die should be accomplished in the following manner (see Bending Attachments – Optional Tooling page for visual reference):

1. Turn the machine off with the ram in the up position and all other tooling removed from the punch end.
2. Bolt the ram adapter onto the ram.
3. Loosen the bolt on the limit switch clamp and raise to 3 1/8" above the ram adapter. Tighten the bolt.
4. Install the limit switch stop on the limit switch rod between the lower limit button and the lower roll pin. Position the button against the limit switch stop (page RP-).
5. Place the bending die on the platen table directly under the punch ram. Do not secure it yet.
6. Place the bending punch in the top "V" groove of the bending die. Visually align the bending punch to the punch stem.
7. Turn the remote foot control ON/OFF selector switch to the "OFF" position.
8. Turn the JOG/RUN selector switch to the "jog" position.
9. Start the machine and activate the punch end joystick (pull downward) to lower the ram. Stop the ram movement when the ram adapter is approximately 1/8" above the bending punch.

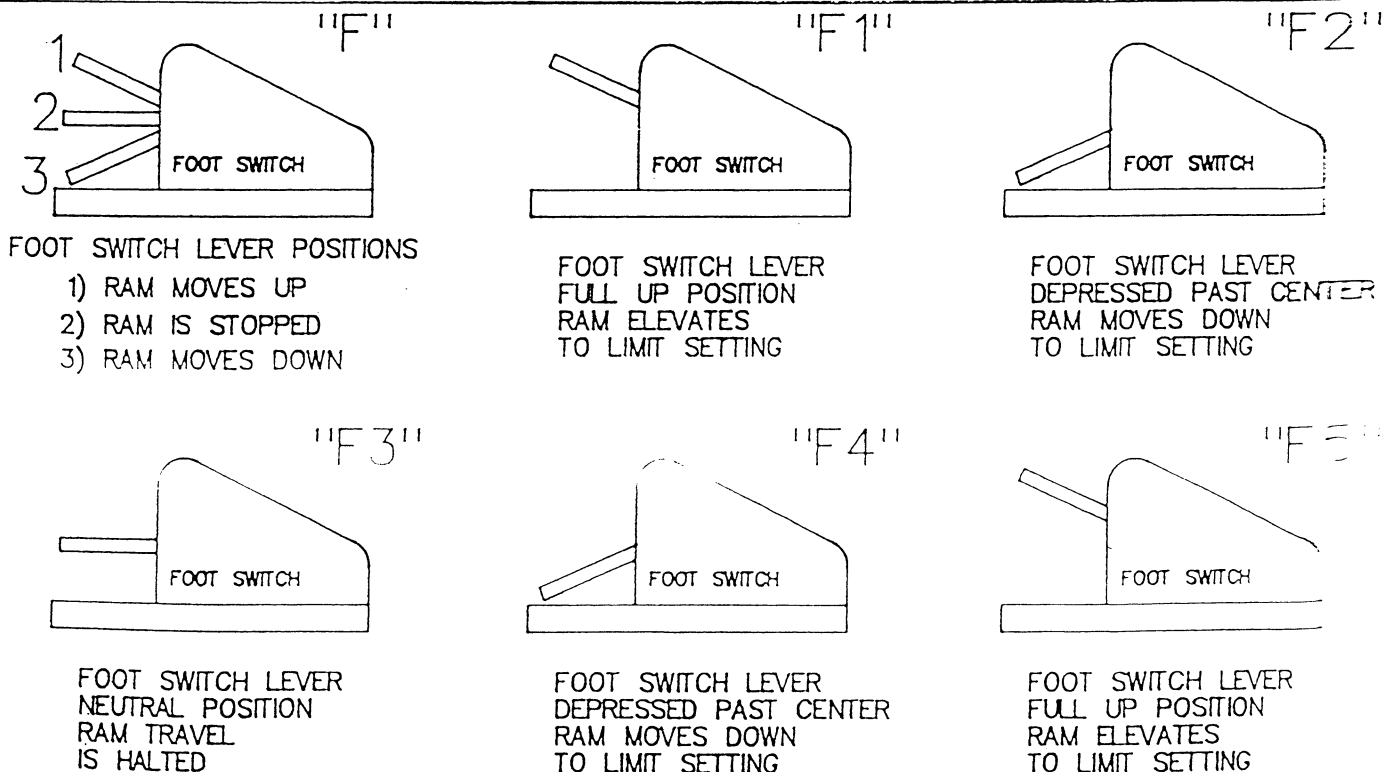
10. Align the bending punch to the ram adaptor and carefully lower the ram into the bending punch collar until fully seated.
11. Rotate the complete bending attachment parallel to the front edge of the platen table and tighten the clamping bolt on the bending punch collar.
11. Secure the four wedge blocks to the platen table to position the bending die on the center line of the bending punch.
12. Set the limit switch buttons to control the length of the stroke and the degree of the bend (see the procedure previously listed).
13. Turn the foot pedal toggle switch to the "ON" position and start the operation.

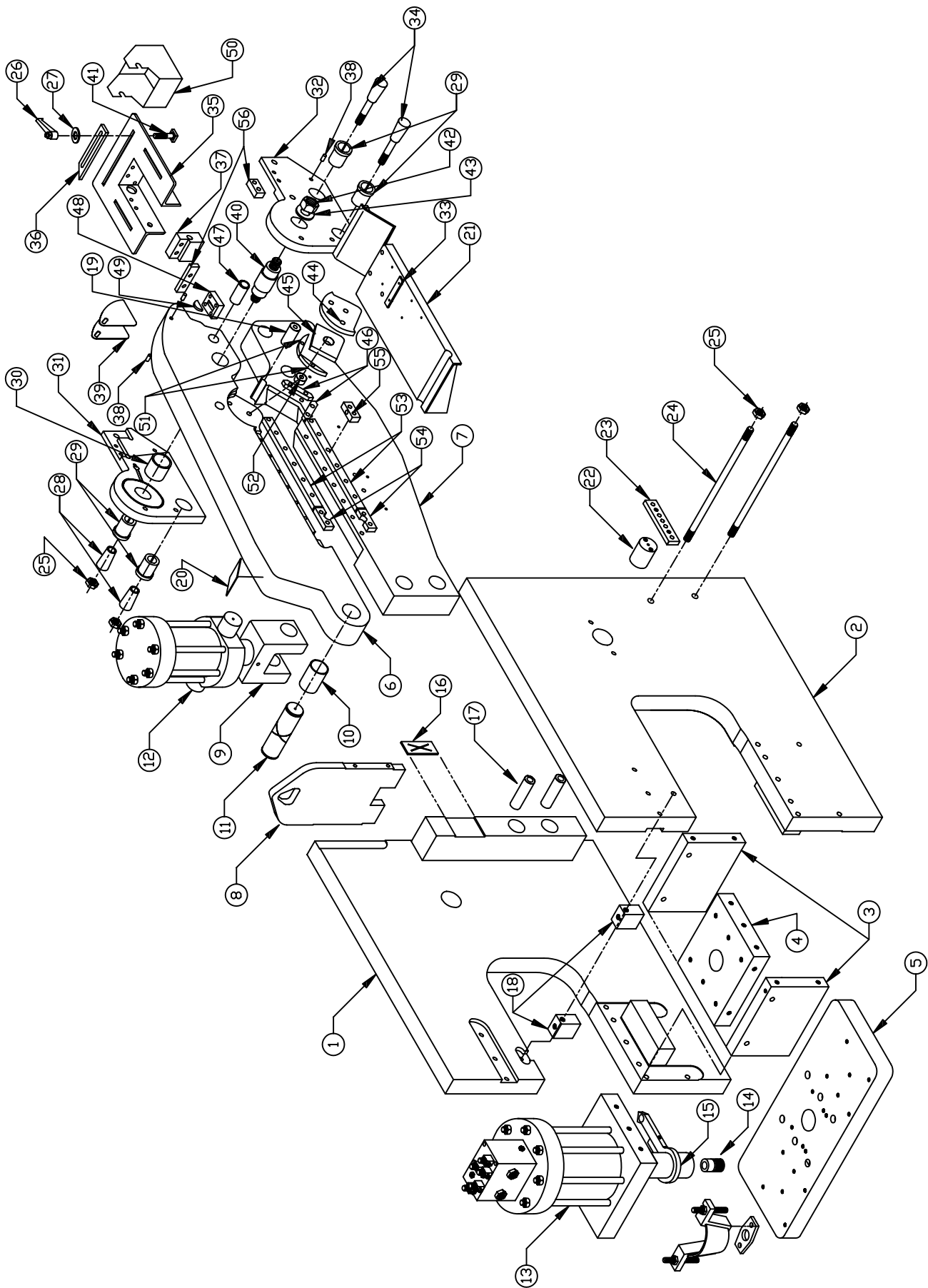
NOTE: Do not remove the limit switch stop while the bending attachment is installed.

Set the limit switch button to allow for 1/4" maximum clearance between the bottom of the bending punch and the work material.

Always center the work material under the punch ram. Side loading will damage the tooling and/or machine.

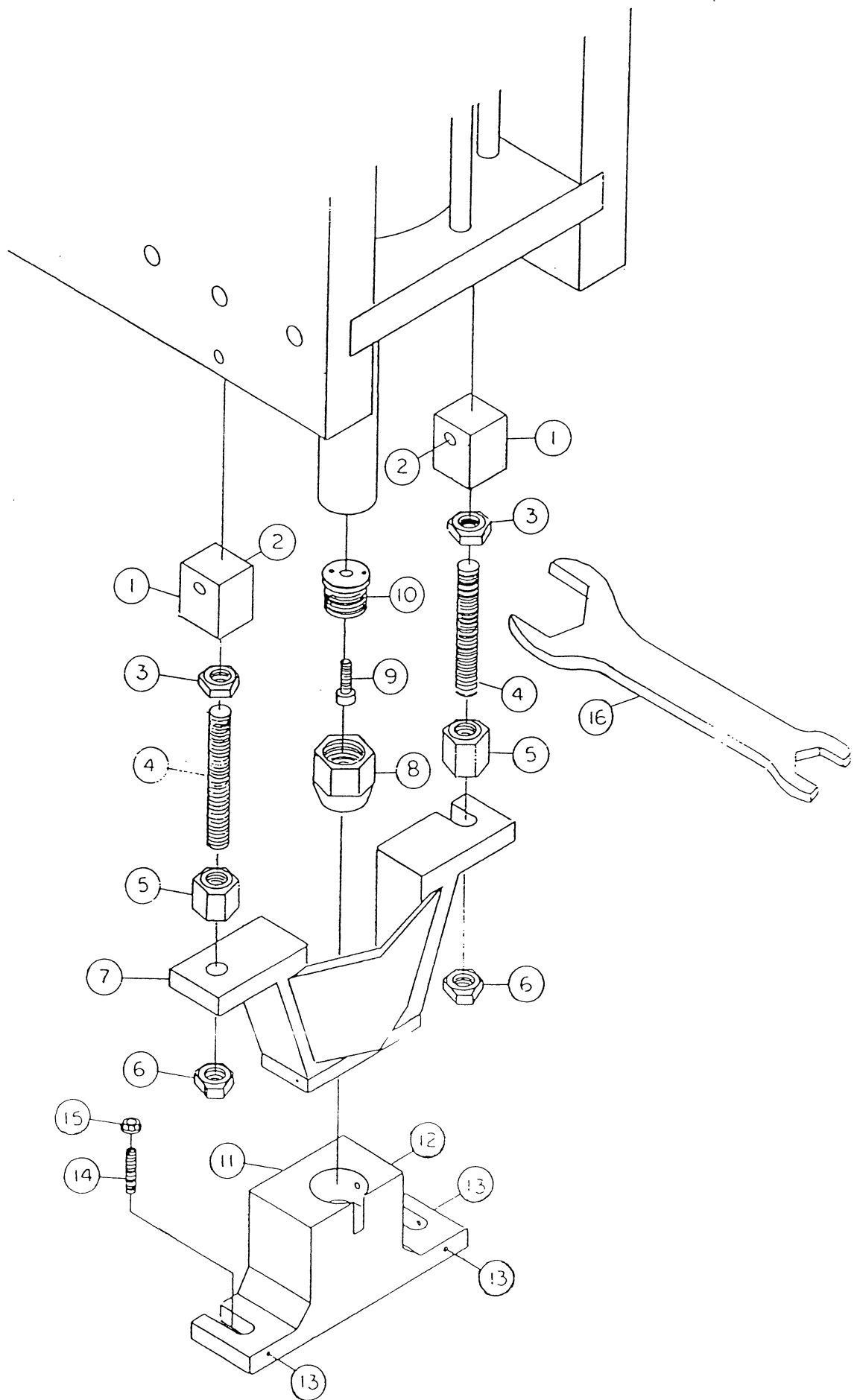
Replace the limit switch clamp in the original position when finished with the bending application.





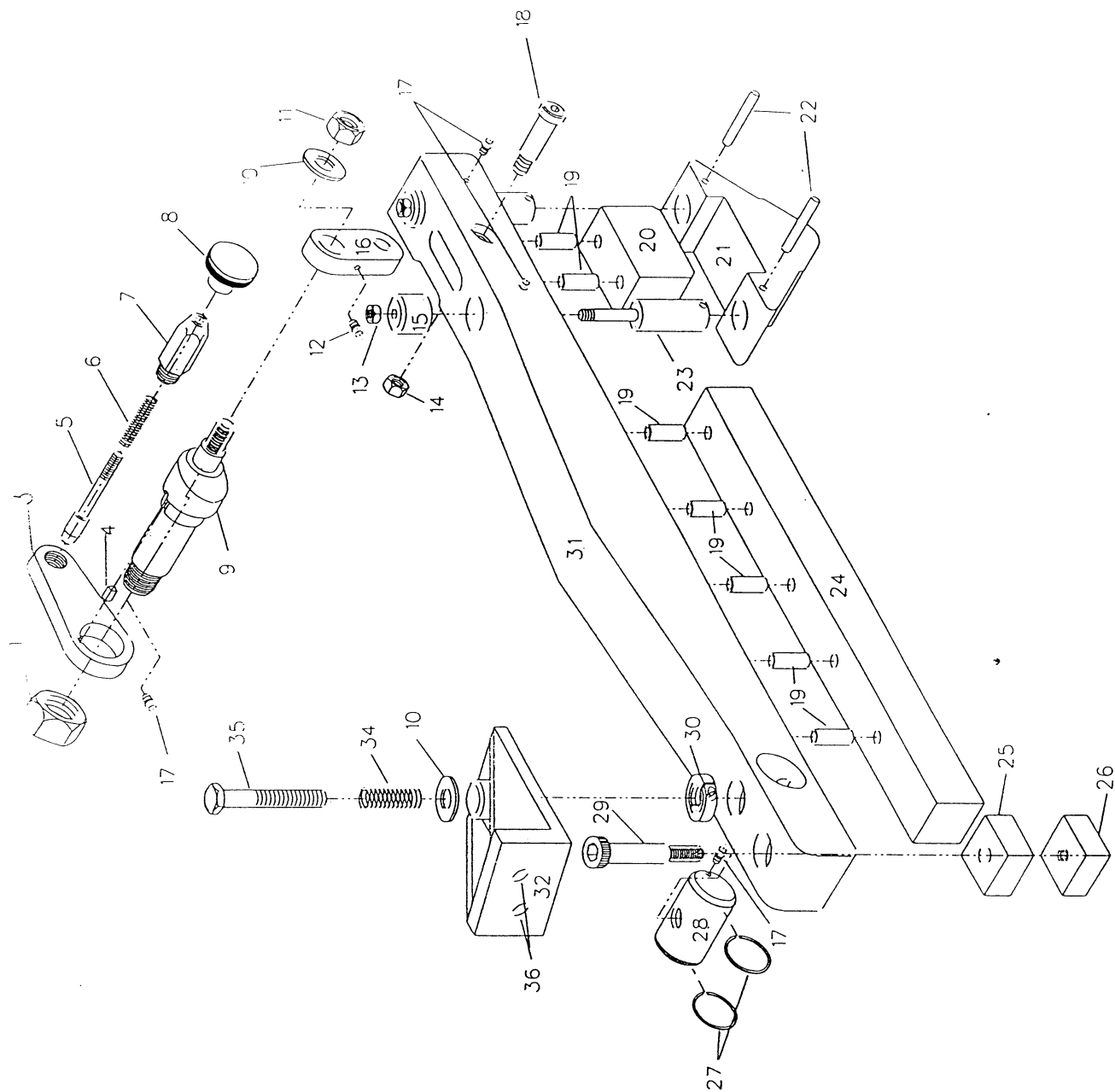
PII65/88 BASIC UNIT

Figure and Index No.	Part Number	Description	Qty.
RP-1	02761141	P65 Off-Side C-Frame	1
OR	02991141	P88 Off-Side C-Frame	1
-2	02761131	P65 On-Side C-Frame	1
OR	02991131	P88 On-Side C-Frame	1
-3	0277117	Front Spacer Plate	1
AND	0276118	Rear Spacer Plate	1
-4	0276112	Platen Support Block	1
-5	02761201	Platen Table	1
-6	0276100	Upper Beam	1
-7	0276101-1	Lower Beam	1
-8	0276400	Lift Plate	1
-9	0272152	Clevis	1
-10	0376168	Clevis Bushing	1
-11	0272164	Clevis Pin	1
-12	0276701	Rear Cylinder Assy.	1
-13	02766001	Front Cylinder Assy.	1
-14	0276125	Punch Stem	1
-15	0276154	Limit Switch Clamp	1
-16	0276145	Bronze Wear Plate	1
-17	0272160	Press Pins	2
-18	0276404	Stripper Mount Blocks	2
-19	0230154	Urethane Spacer	1
-20	0376399	Beam Guard	1
-21	02761211	Combo Table	1
-22	0276172	Trunion Press Pin with Bushing	2
-23	0276173	Trunion Strap	2
-24	0376706	Tie Bolt 1" x 17" P65	2
OR	0279156	Tie Bolt 1" x 19" P88	2
-25	0531260	1" Hex Nut	6
-26	0531715	Plastic Handle	3
-27	0531307	Flat Washer	3
-28	0230163	Taper Pin Plug	2
-29	0230161	Taper Pin Split Bushing	4
-30	0330170	Rear Hinge Pin Bushing	1
-31	0230116	Coper Side Plate Off-Side	1
-32	02301151	Coper Side Plate On-Side	1
-33	0276140	Shear Table Guide	1
-34	0230160	Taper Pins	2
-35	0376124	On-Side Coper Table Angle	1
AND	0330125	Off-Side Coper Table Angle	1
AND	0330126	End Coper Table Angle	1
-36	0330128	Coper Table Guide	3
-37	0230117	Coper End Knife Support	1
-38	0531352	1/2" x 1-1/2" Roll Pin	2
-39	0230142	Coper Guard	1
-40	0230166	Rear Hinge Pin	1
-41	0531088	1/2" x 1-1/2" Carriage Bolt	3
-42	0531270	1-1/2" NF Jam Nut	2
-43	0531303	1-1/2" Washer	2
-44	0230146	Angle Knife Cover	1
-45	0230273	Upper Angle Knife	1
-46	0230274	Lower Angle Knife	2
-47	0230155	Black Pipe Spacer	1
-48	0230277	Upper Coper Knife	1
-49	0531330	Woodruff Key	1
-50	0230143	Chip Bucket	1
-51	0230156	Angle Knife Blocks	2
-52	0230167	Angle Knife Bushing	1
-53	0276252 or 0276253	20.625" or 24" Flat Shear Knives	2
-54	023026?	Round Bar Knives (Multiple Sizes Avail.)	2
-55	0230147	Shear Table Adj. Block	1
-56	0230276	Lower Coper Knives	3



PII65/88 PUNCH ASSEMBLY

FIGURE AND INDEX NO.	PART NUMBER	DESCRIPTION	QTY.
RP - 1	0276404	Stripper Mount Blocks	2
2	0531090	5/8 x 1 3/4 SHCS	2
3	0541185	3/4 JN	2
4	0276405	Stripper Stud	2
5	0541396	3/4 CL-4-CN	2
6	0541182	3/4 HN	2
7	0276401	Stripper Assembly	1
8	0276126	Coupling Nut	1
9	0531092	5/8 x 2 1/4 SHCS	1
10	0276125	Punch Stem	1
11	0240400	Die Block	1
12	0541085	7/16 x 3/4 SSS	1
13	0531002	1/4 x 3/4 SSS	1
14	0541127	5/8 x 3 1/2 SSS	1
15	0531251	5/8 Flanged Nut	2
46	0241410	Coupling Wrench	1



PII 65/88 HOLD DOWN ASSEMBLY

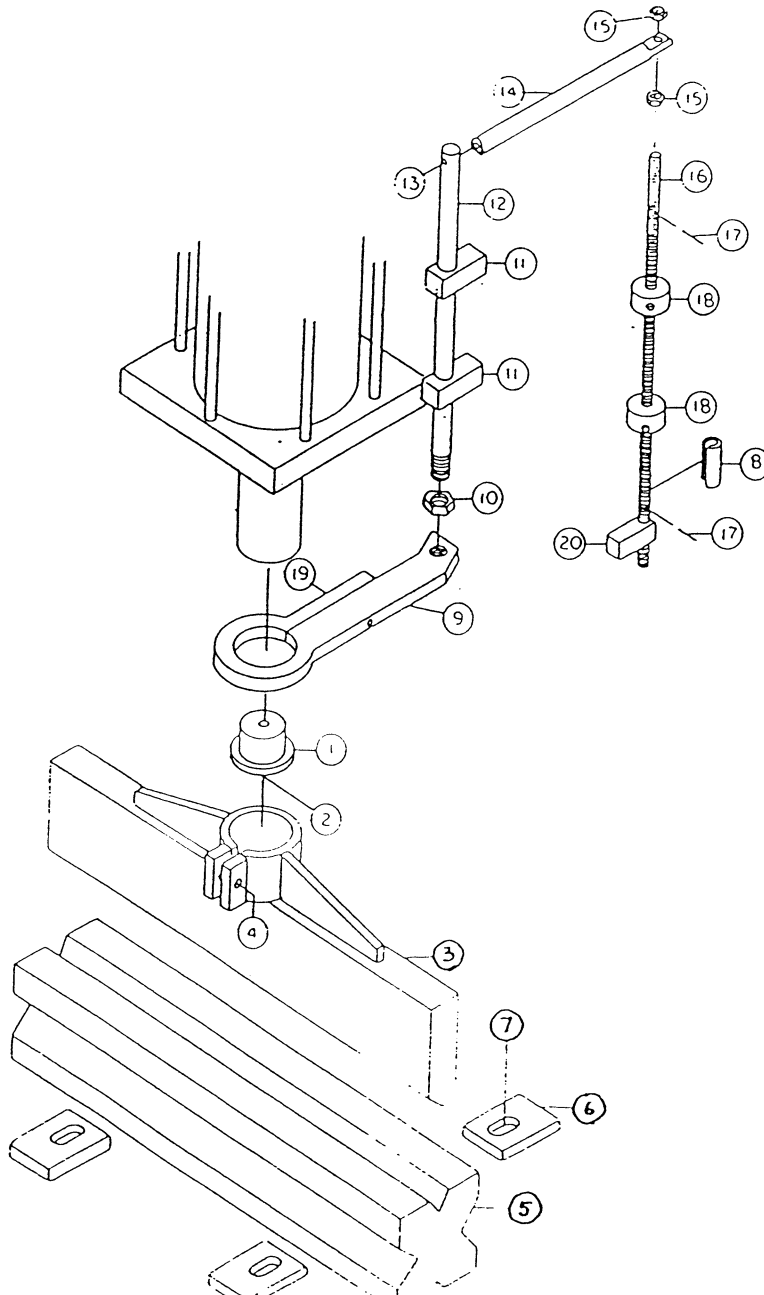
Part # 02762201

Figure And Index No.	Part Number	Description	Qty.
RP-1	0531271	1 ¼-12 JN	1
-2	N/A	N/A	N/A
-3	0330214	Locator Plate	1
-4	0330215	Hold Down Pin Key	1
-5	0340212	Locator Pin	1
-6	0340216	Locator Pin Spring	1
-7	0340213	Locator Pin Housing	1
-8	0541393	Locator Pin Knob	1
-9	02302011	Hold Down Pin	1
-10	0531300	¾ Hard Black Flat Washer	2
-11	0531255	¾ Nylock HN	1
-12	0531363	1637-B Zerk ¼-28 45	1
-13	0531212	3/8 Nylock HN	2
-14	0531216	½ Nylock HN	1
-15	0376221	Angle Guide Sleeve	2
-16	0330202	Hold Down Link	1
-17	0531362	1652 Zerk ¼-28 Straight	4
-18	0531104	5/8 x 2 SB	1
-19	0531352	½ x 1 ½ Roll Pin	7
-20	0376228	Angle Urethane	1
-21	0376224	Angle Block	1
-22	0541062	5/16 x 2 ½ Spiral Pin	2
-23	0376223	Angle Guide Pin	2
-24	0376227	Shear Urethane	1
-25	0330209	Round Bar Urethane	1
-26	0330205	Round Bar Block	1
-27	0571350	5108-177 Snap Ring	2
-28	0376232	Hold Down Shaft	1
-29	0531114	¾ x 3 SB	1
-30	0571355	Threaded Collar	1
-31	03762201	Hold Down Bar	1
-32	03762341	Hold Down Bracket	1
-33	N/A	N/A	N/A
-34	0376226	Hold Down Spring	1
-35	0571080	¾ x 7 ½ HH w/4" Thread	1
-36	0531090	5/8 x 1 ¾ SHCS	2

Note: Hold Down Assembly #02762201
Includes Index Numbers 10-29 & 31

PII65/88 LIMIT SWITCH ASSEMBLY

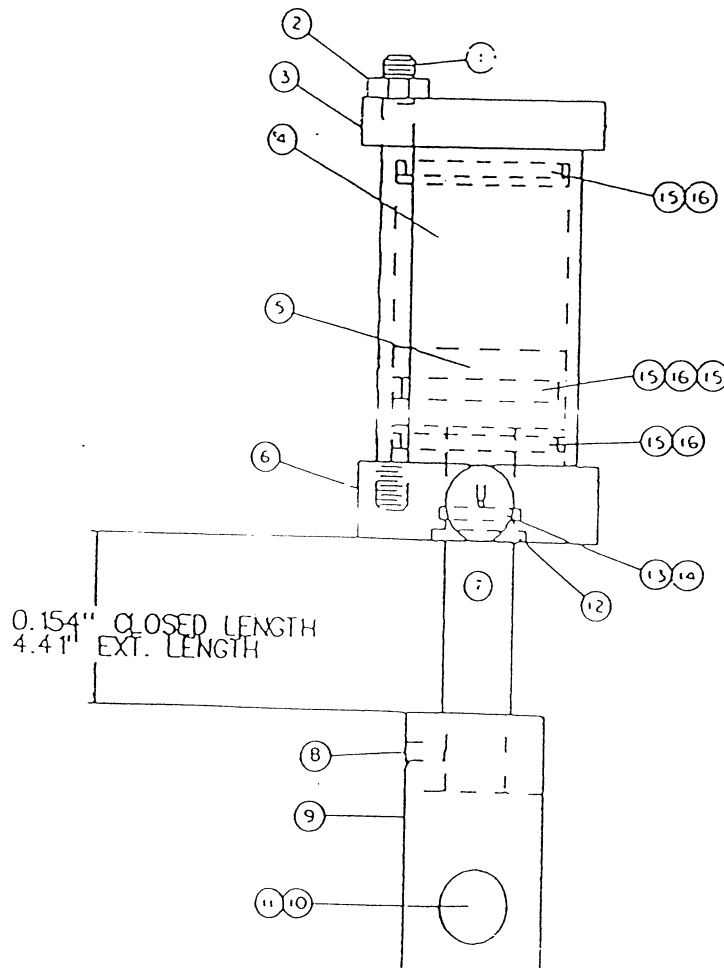
FIGURE AND INDEX NO.	PART NUMBER	DESCRIPTION	QTY.
RP - 9	0276153	Limit Switch Clamp	1
10	0541185	3/4 JN	1
11	0371155	Limit Switch Rod Holder - Inner	2
12	0376153	Limit Switch Rod Long	1
13	0531081	1/2 x 1 1/4 SHCS	1
14	0376154	PII65 Limit Switch Rod Short	1
14	0379154	PII88 Limit Switch Rod Short	1
15	0581195	1/2 HN	2
16	0376157	Limit Switch Actuator Rod	1
17	0531004	1/8 x 7/8 RP	1
18	0272154	Limit Switch Button Assembly	1
19	0531086	1/2 x 1 3/4 SHCS	1
20	0371156	Limit Switch Rod Holder - Outer	1



PII 65/88 5" REAR CYLINDER ASSEMBLY PART #0276701

FIGURE AND INDEX NO.	PART NUMBER	DESCRIPTION	QTY.
RP - 1	0371706	5" Cylinder Tie Bolt	4
- 2	0571204	7/8" HN	4
- 3	0371702	5" Cylinder End Cap	1
- 4	0371703	5" Cylinder Tube	1
- 5	0371701	5" Cylinder Piston	1
- 6	0372704	5" Cylinder Trunnion Cap	1
- 7	0376707	5" Cylinder Piston Rod	1
- 8	0531085	1/2 X 1/2 SSS	1
- 9	0272152	Cylinder Clevis	1
- 10	0272164	Clevis Pin	1
- 11	0541310	Snap Ring	2
- 12	0571704	2" Piston Rod Seal	1
- 13	0571703	2" Backup Ring	1
- 14	0571702	2" O-Ring	1
- 15	0571701	5" Backup Ring	4
- 16	0571700	5" O-Ring	3

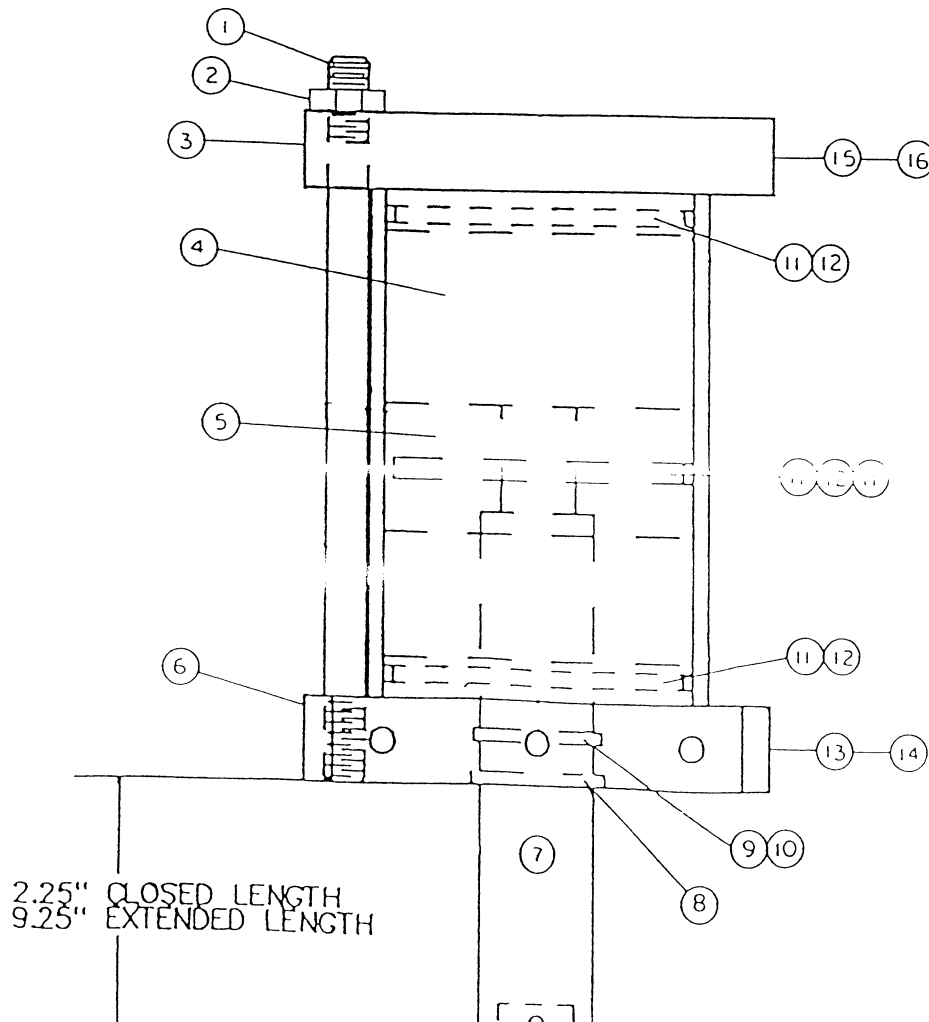
NOTE: Assembly includes parts 1-7 and 12-16.



PII65/88 8" FRONT CYLINDER ASSEMBLY PART #02767001

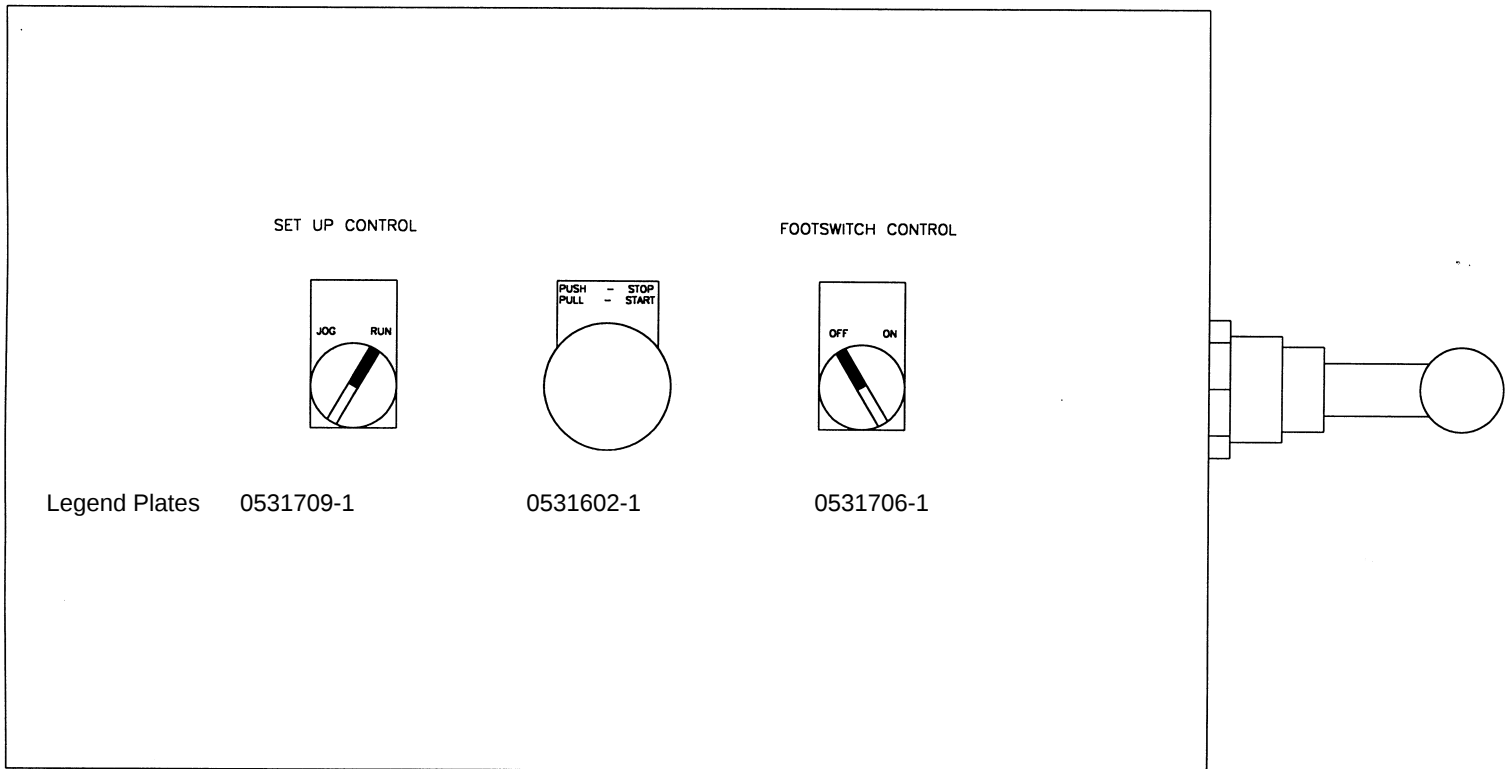
FIGURE AND INDEX NO.	PART NUMBER	DESCRIPTION	QTY.
RP - 1	0376706	8" Cylinder Tie Bolt	6
- 2	0531260	1" NF HN	6
- 3	03767021	8" Cylinder End Cap	1
- 4	0376703	8" Cylinder Tube	1
- 5	0376701	8" Cylinder Piston	1
- 6	0376704	8" Cylinder Bearing Cap	1
- 7	0376705	8" Cylinder Piston Rod	1
- 8	0571711	3" Piston Rod Seal	1
- 9	0571709	3" O-Ring	1
-10	0571710	3" Backup Ring	1
-11	0571708	8" Backup Ring	4
-12	0571707	8" O-Ring	3
-13	0571545	6802-8 Fitting	1
-14	0571521	36" Hose to Electric Valve Assembly	1
-15	0571505	6801-8 Fitting	1
-16	0571528	52" Hose to Electric Valve Assembly	1

NOTE: Assembly includes parts 1-12.



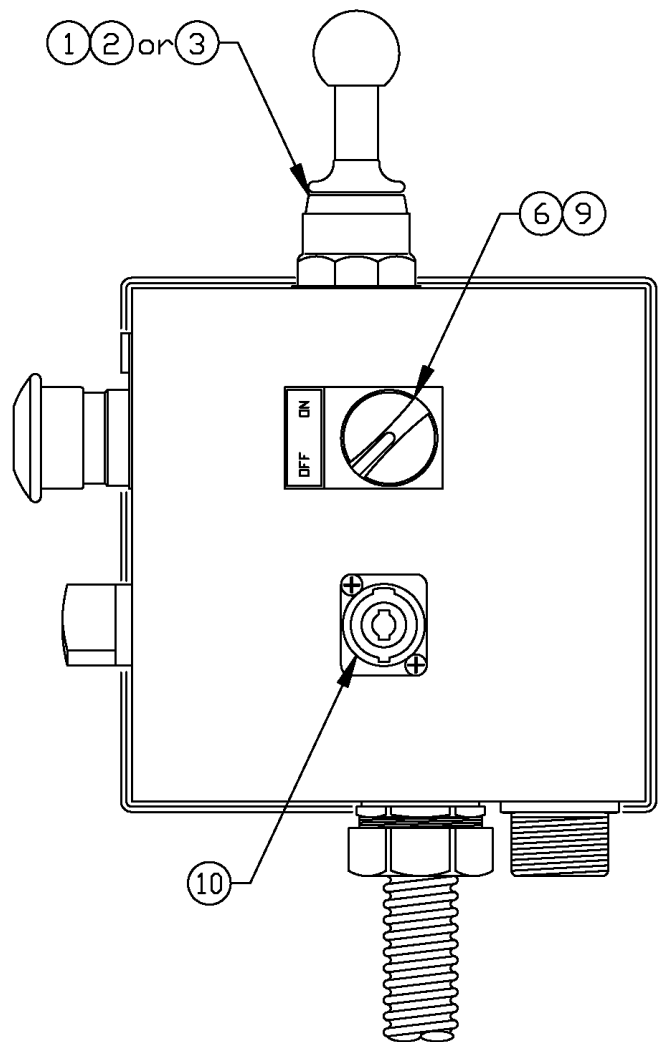
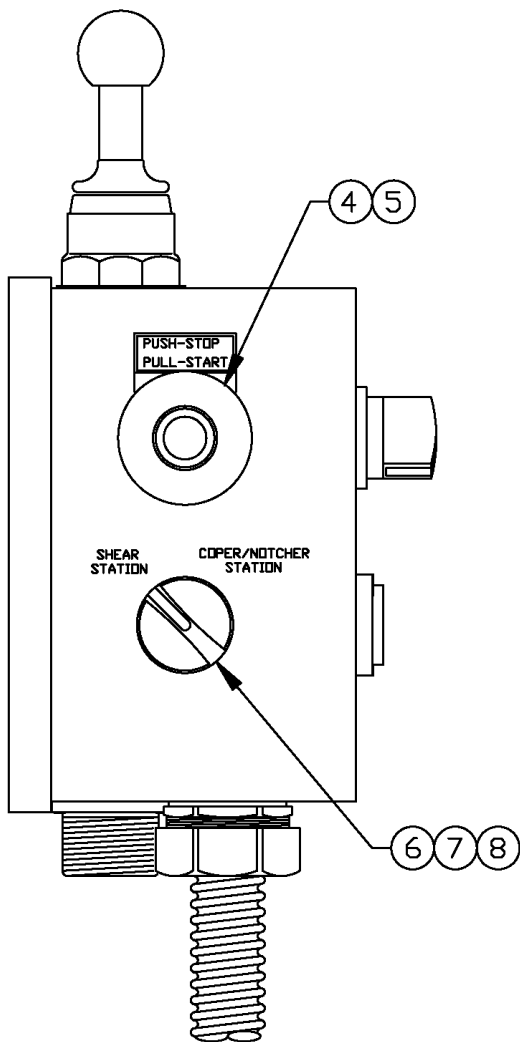
P/S 65/88 PUNCH CONTROL ASSEMBLY

Figure Description	Part Number	Item Description	Qty.
Set Up Control	0531695-1	Selector Switch 2-Position	1
	0531696-1	Contact Block with Base N.O.	1
	0591596-1	Contact Block N.C.	1
Start/Stop Button	0531643-1	Push/Pull Button	1
	05316121-1	Contact Block with Base N.C.	1
Footswitch Control	0531695-1	Selector Switch 2-Position	1
	0531696-1	Contact Block with Base N.O.	1
Joystick Control	0591608	Joystick	1
	0531644	Contact Block	2
	or 0591608-1	Joystick Assy. (w/Contact Blocks)	1



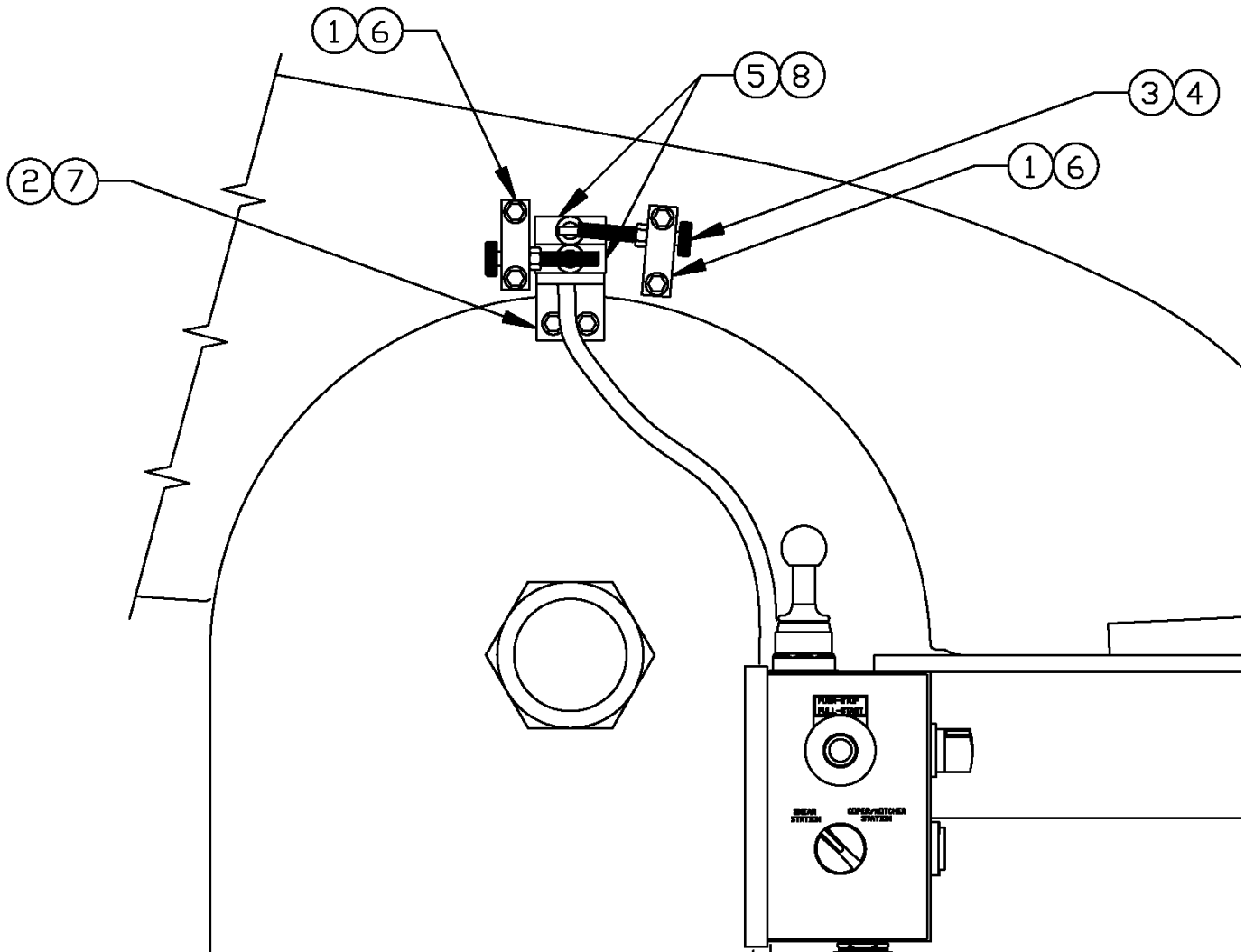
PII REAR BOX ASSEMBLY PART #0278630-1

Figure and Index No.	Part Number	Description	Qty.
RP-1	0591608	Joystick	1
-2	0531644	Contact Block	2
-3	0591608-1	Joystick Assy. (W/Contact Blocks)	1
-4	0531643-1	Push Pull Button	1
-5	05316121-1	Contact Block with Base N.C.	1
-6	0531695-1	Selector Switch 2-Position	1
-7	0531678-1	Mounting Base with 2-N.O. Contacts	1
-8	0591596-1	Contact Block N.C.	3
-9	0531696-1	Contact Block with Base N.O.	1
-10	0531618	4 Pole Receptacle	1



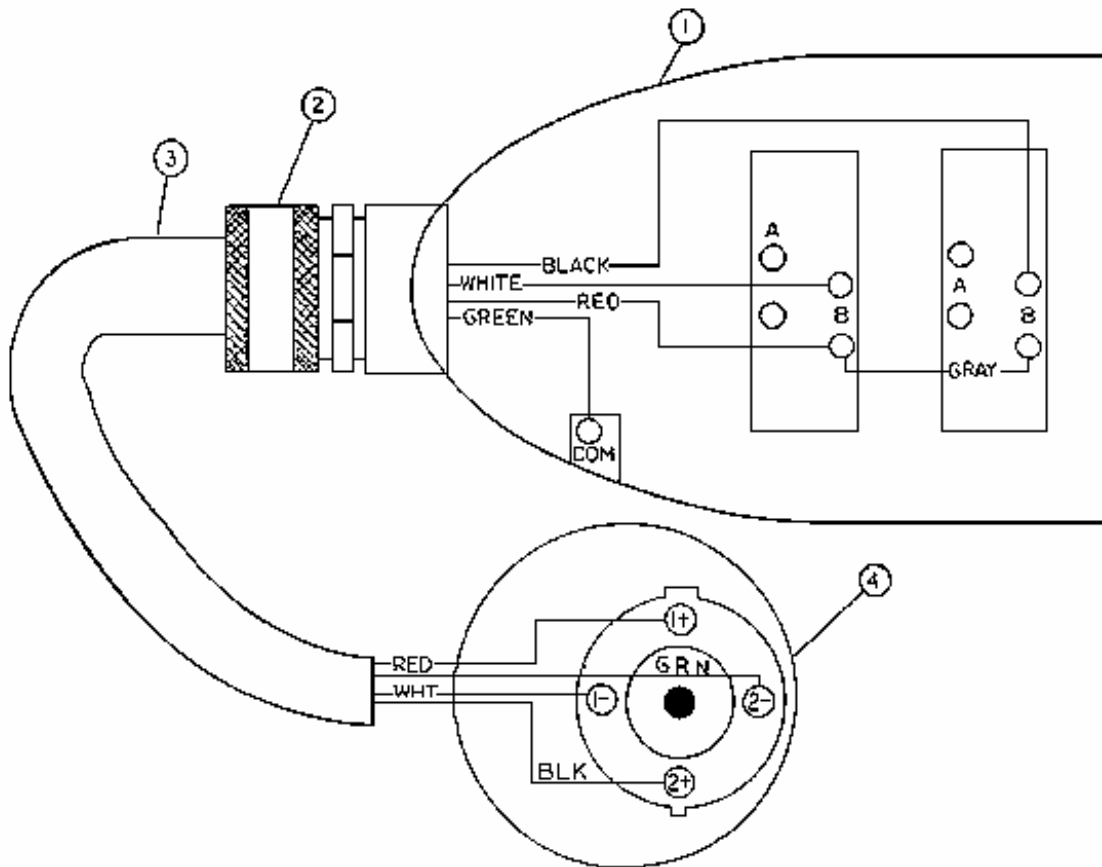
PII REAR LIMIT SWITCH ASSEMBLY

Figure and Index No.	Part Number	Description	Qty.
RP-1	0278153	PII110/140 Rear Limit Switch Adjusting Block	2
OR	0276151	PII65/88 Rear Limit Switch Adjusting Block	2
-2	0278154	PII Rear Limit Switch Mounting Bracket	1
-3	0541060	5/16" Knurled Head Screw	2
-4	0541025	5/16" Hex Nut	2
-5	0531615	Limit Switch	2
-6	0531022	5/16" x 2" SHCS	4
-7	0531039	3/8" x 3/4" SHCS	2
-8	0278635	Rear Limit Switch Box Assy. (Includes Box, Limit Switches and Cable)	1



FOOT SWITCH ASSEMBLY **PART # 0231628**

Figure and Index No.	Part Number	Description	Qty.
RP-1	0531655	Foot Switch	1
-2	0531636	Cord Grip	1
-3	0531637	16-4 SEO Cord	
-4	0531617	4 Pole Plug	1



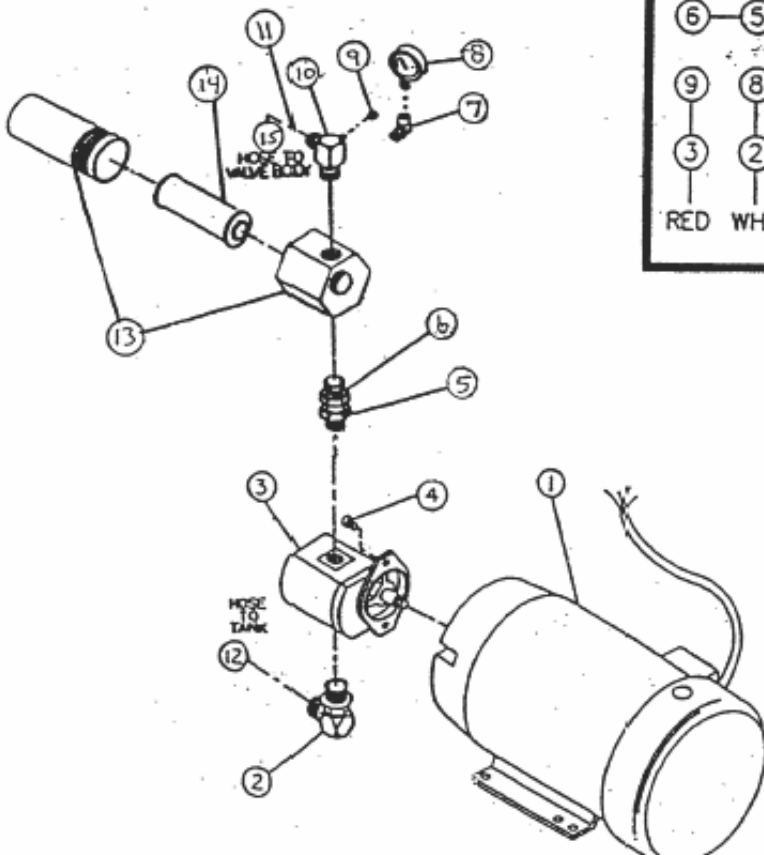
PII65/88 MOTOR, PUMP AND FILTER ASSY

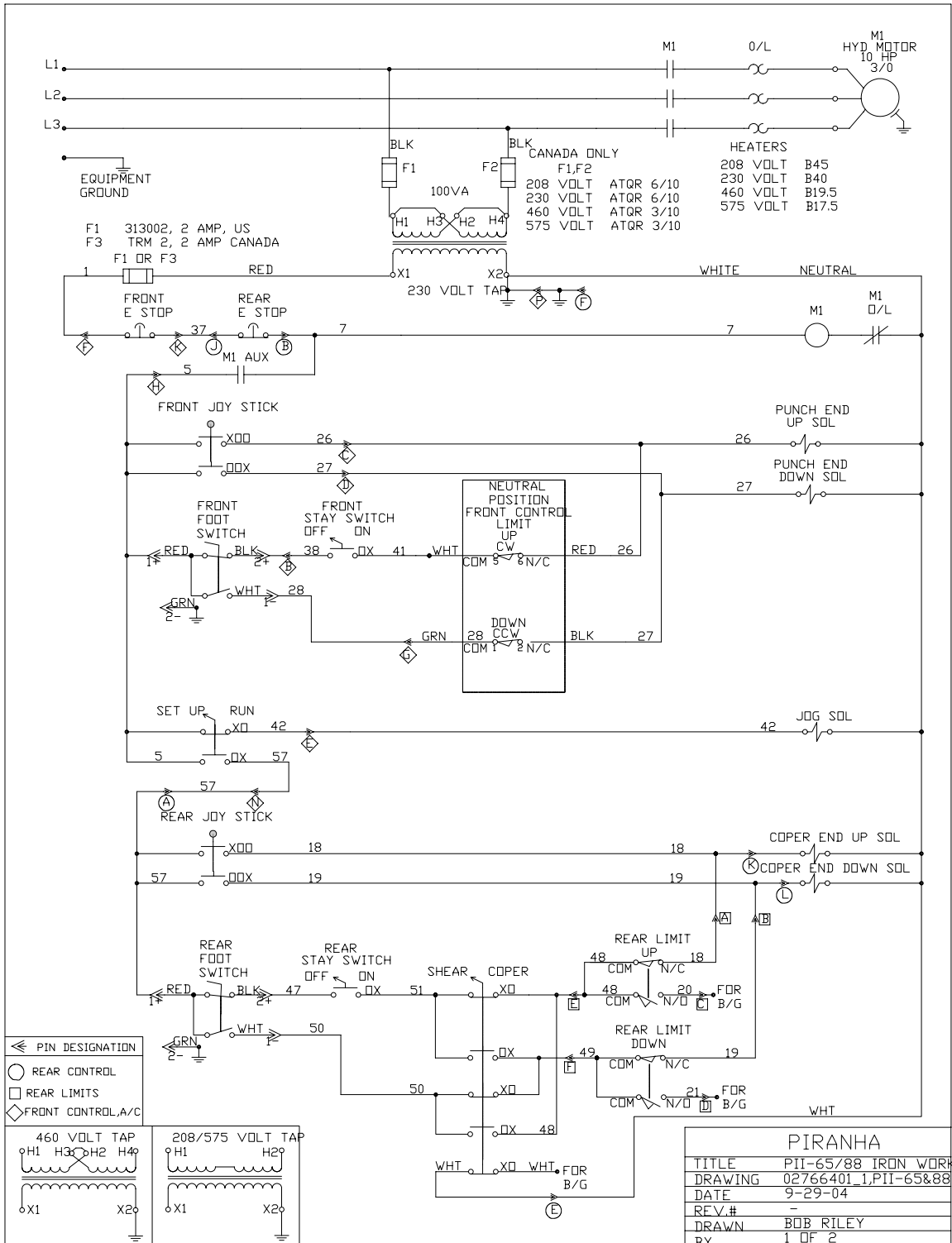
PART # 02766001

Figure and Index No.	Part Number	Description	Qty.
-1	05316612	10 HP Motor 220/440V (5/8" Hollow Shaft)	1
OR	05316652	10 HP Motor 575V (5/8" Hollow Shaft)	1
OR	05316702	10 HP Motor 220V Single Phase (5/8" Hollow Shaft)	1
-2	0531676	Hyd. Fitting 6801-16-12	1
-3	05215691-2	Hydraulic Pump	1
-4	0531050	3/8" x 1" SHCS	2
-5	0551511	Hyd. Fitting 6402-12-12	1
-6	0591506	Hyd. Fitting 6400-12-16	1
-7	0541534	Hyd. Fitting 6503-12-4	1
-8	0541542	Pressure Gauge	1
-9	0541532	Hyd. Fitting 304-C-12	1
-10	0531538	Hyd. Fitting 6801-12-16	1
-11	0571577	Hyd. Fitting 6602-12-12	1
-12	0571526	36" Hose to Tank	1
-13	0521550-2	Filter Assembly 4"	1
-14	0521551-2	Filter Element 4"	1
-15	0571590	84" Hose to Valve Body	1

BALDOR 10 HP MOTOR WIRING

LOW VOLTAGE	HIGH VOLTAGE	CANADIAN 600V
6 — 5 — 4 9 — 8 — 7 3 — 2 — 1 RED WHT BLK	6 — 5 — 4 9 — 8 — 7 3 — 2 — 1 RED WHT BLK	3 — 2 — 1 RED WHT BLK

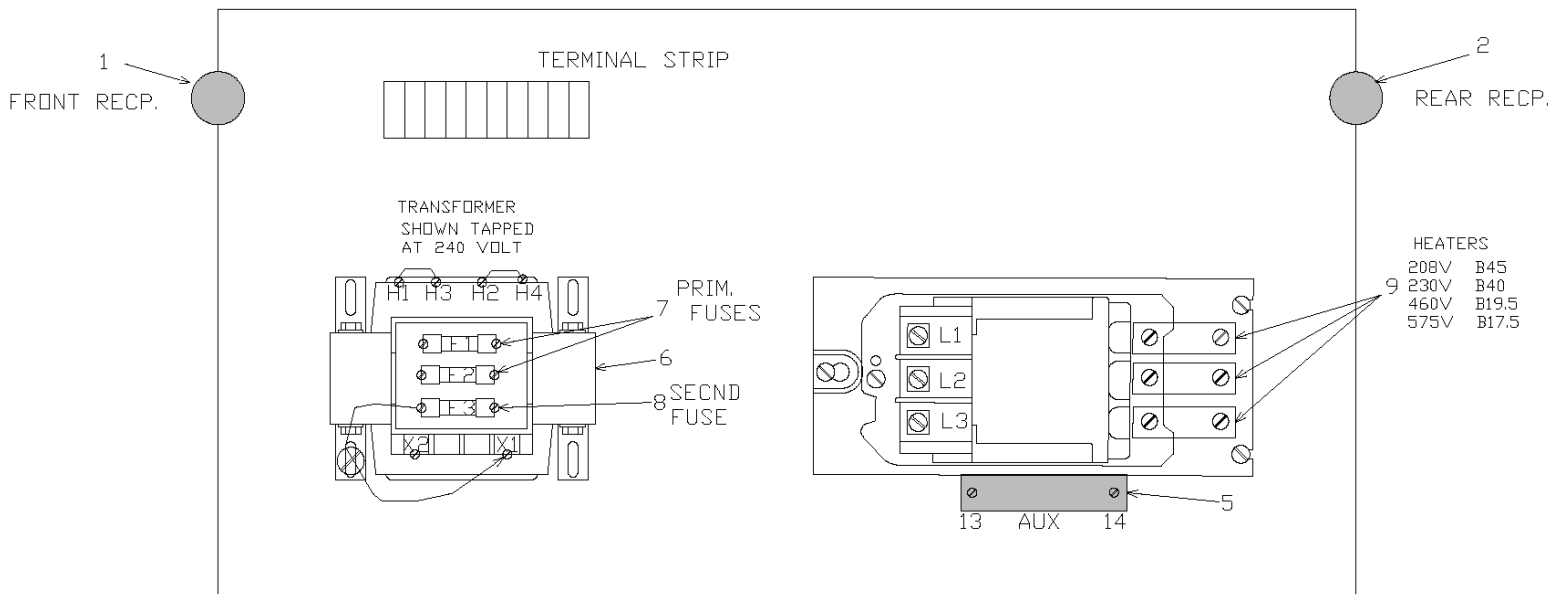




PII65/88 ELECTRICAL ENCLOSURE

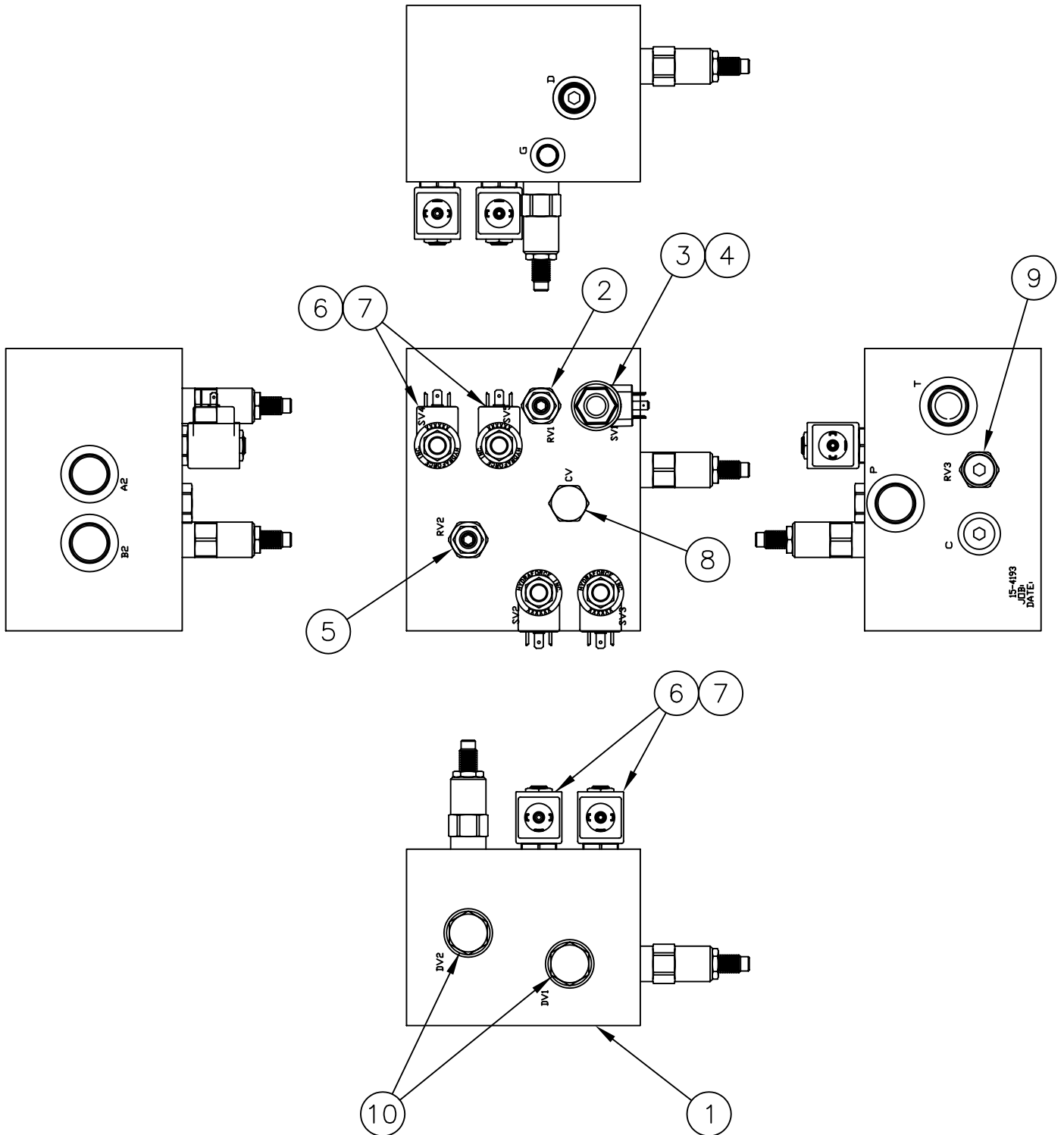
PART # 02766401

Figure and Index No.	Part Number	Description	Qty.
RP-1	N/A	Female Receptacle Front	1
-2	N/A	Female Receptacle Rear	1
-3	0531641	Starter 208-575V 3 Phase	1
OR	0541641	Starter 230V Single Phase	1
-5	T0731	Starter Aux. Contact	1
-6	0531651	Transformer 208V 3 Phase	1
OR	05316831	Transformer 230-460V 3 Phase	1
OR	0531652	Transformer 575V 3 Phase	1
OR	05416491	Transformer 230V Single Phase	1
-7	T0771	Primary Fuse 208/230V	2
OR	T2249	Primary Fuse 230V Single Phase	2
OR	T0794	Primary Fuse 460V	2
OR	T0794	Primary Fuse 575V	2
-8	T3189	Secondary Fuse 208-460V 3 Phase	1
OR	T3189	Secondary Fuse 575V 3 Phase	1
OR	T3189	Secondary Fuse 230V Single Phase	1
-9	0531638	Heater Coils 208V 3 Phase	3
OR	0531639	Heater Coils 230V 3 Phase	3
OR	0531634	Heater Coils 460V 3 Phase	3
OR	0531635	Heater Coils 575V 3 Phase	3
OR	0531624	Heater Coils 230V Single Phase	3



VALVE BODY ASSEMBLY

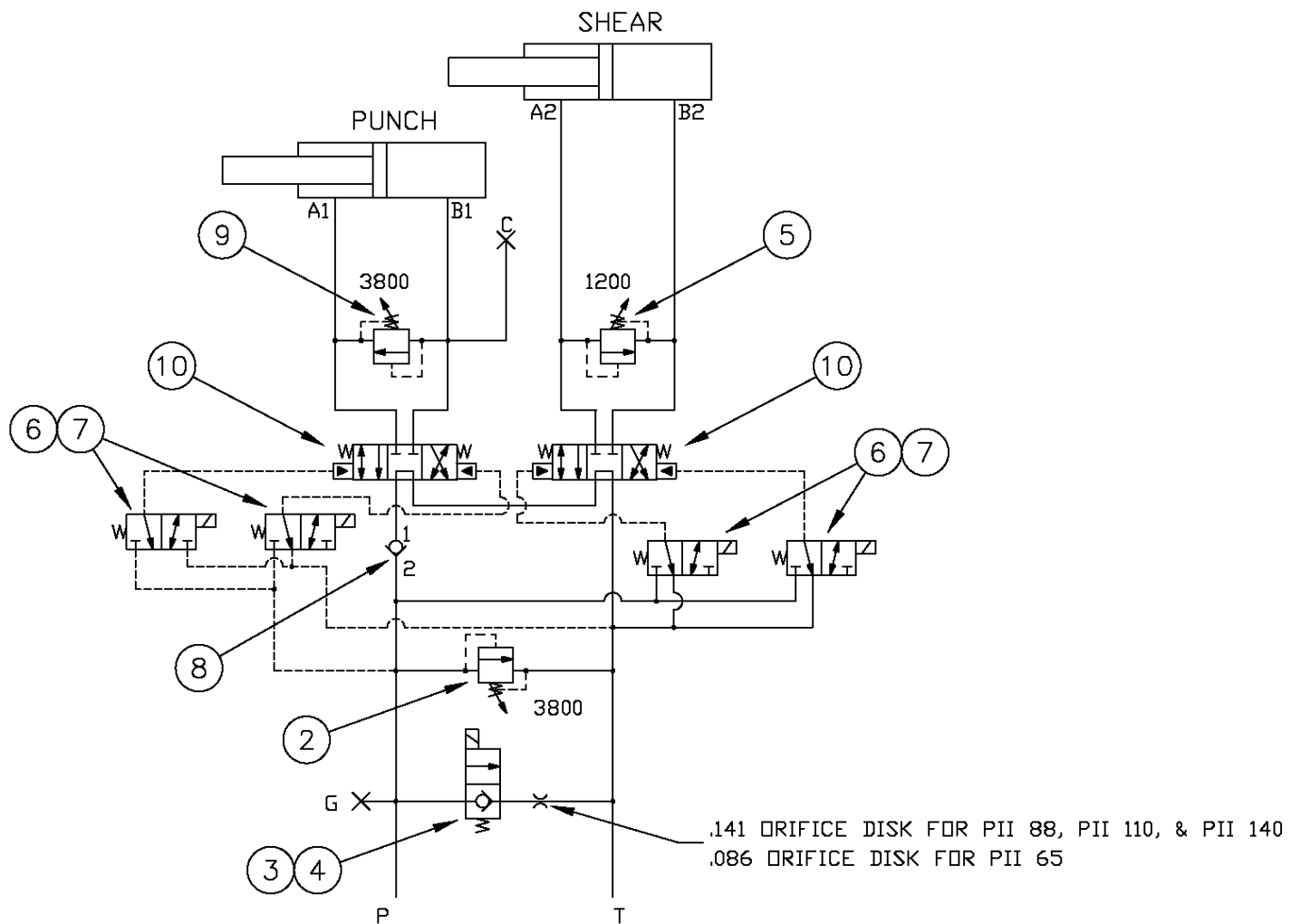
PART No. 05915341-1



VALVE BODY ASSEMBLY

PART # 05915341-1

Figure and Index No.	Part Number	Description	Qty.
RP-1	0591534	Valve Body	1
-2	T3581	Pressure Relief Valve 50/38	1
-3	0591540-1	Solenoid Valve Normally Closed	1
-4	0591541-1	115V AC Solenoid Coil	1
-5	0591538-1	Pressure Relief Valve 25/12	1
-6	0591539-1	Solenoid Valve	4
-7	05915342	115V AC Solenoid Coil	4
-8	0591546	Cavity Plug	1
-9	T3581	Pressure Relief Valve 50/38	1
-10	0591536	Directional Valve Cartridge	2



HYDRAULIC SCHEMATIC

Begins with S/N xxxx

PII 65/88 KNIVES

Index Number	Part Number	Description	Qty.
	0276252	Flat Shear Knives x 20.625" - Standard	2
	0276253	Upper Flat Shear Knife x 24" w/ Hardware	1
	0276254	Lower Flat Shear Knife x 24" w/ Hardware	1
	0230280	1/4" Round Bar Knife	2
	0230252	3/8" Round Bar Knife	2
	0230254	1/2" Round Bar Knife	2
	0230256	5/8" Round Bar Knife	2
	0230258	3/4" Round Bar Knife	2
	0230260	7/8" Round Bar Knife	2
	0230262	1" Round Bar Knife	2
	0230264	1 1/8" Round Bar Knife	2
	0230266	1 1/4" Round Bar Knife	2
	0230268	1 3/8" Round Bar Knife	2
	0230269	1 1/2" Round Bar Knife	2
	0230283	1/2" Square Bar Knife	2
	0230284	5/8" Square Bar Knife	2
	0230270	3/4" Square Bar Knife	2
	0230272	1" Square Bar Knife	2
	0230253	Blank Round Bar Knife	2
	0276274	Angle Knife - Lower	2
	0230273	Angle Knife - Upper	1
	0230276	Coper Knife - Lower & Sides	3
	0230277	Coper Knife - Upper	1
	0531050	3/8" x 1" SHCS - Upper Coper	4
	0531072	7/16" x 2 1/4" SHCS - Rear Coper	2
	0531069	7/16" x 1 1/2" SHCS - Side Coper	4
	0531070	7/16" x 1 3/4" SHCS - Upper Shear	7
	0531071	7/16" x 2" SHCS - Lower Shear	7
	0531070	7/16" x 1 3/4" SHCS - Upper Rd. Bar	2
	0531071	7/16" x 2" SHCS - Lower Rd. Bar	2
	0531071	7/16" x 2" SHCS - Lower Angle	4
	0531330	Woodruff Key - Upper Coper Knife	1

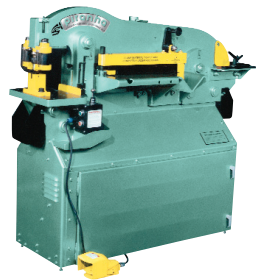
PII 65/88 BENDING ATTACHMENTS OPTIONAL TOOLING

FIGURE AND INDEX NO.	PART NUMBER	DESCRIPTION	QTY.
RP - 1	4476520	18" Bending Attachment	
	4476530	Ram Adaptor	1
	0521040	5/8 x 1 1/2 SHCS	1
	4476521	18" Bending Punch	1
	0571060	5/8-18 x 2 SHCS	1
	4476527	18" 4 Way Bending Die	1
	4476528	Bending Die Wedge Block	4
	0541150	3/4 x 1 3/4 SHCS	4
	0276152	Limit Switch Stop	1
1	4476540	24" Bending Attachment	
	4476530	Ram Adaptor	1
	0521040	5/8 x 1 1/2 SHCS	1
	4476541	24" Bending Punch	1
	0571060	5/8-18 x 2 SHCS	1
	4476547	24" 4 Way Bending Die	1
	4476528	Bending Die Wedge Block	4
	0541150	3/4 x 1 3/4 SHCS	4
	0276152	Limit Switch Stop	1
1	4476560	36" Bending Attachment	
	4476530	Ram Adaptor	1
	0521040	5/8 x 1 1/2 SHCS	1
	4476561	36" Bending Punch	1
	0571060	5/8-18 x 2 SHCS	1
	4476567	36" 4 Way Bending Die	1
	4476528	Bending Die Wedge Block	4
	0541150	3/4 x 1 3/4 SHCS	4
	0276152	Limit Switch Stop	1
1	4476580	48" Bending Attachment	
	4476530	Ram Adaptor	1
	0521040	5/8 x 1 1/2 SHCS	1
	4476581	48" Bending Punch	1
	0571060	5/8-18 x 2 SHCS	1
	4476587	48" 4 Way Bending Die	1
	4476528	Bending Die Wedge Block	4
	0541150	3/4 x 1 3/4 SHCS	4
	0276152	Limit Switch Stop	1

Additional Fabricating Equipment



Dual Operator Ironworkers
35 to 140 tons



Single Operator Ironworkers
36 to 120 tons



Punch Presses
35 to 140 tons



Press Brakes
25 to 500 tons

Precision Press Brakes
25 to 500 tons



Hydro-Mechanical Shears
1/4" to 1/2"



3 & 4 Roll
Manual/Hydraulic



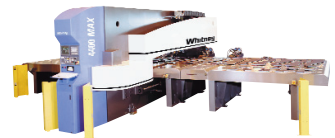
Section Bending Rolls

Whitney

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