



INSTRUCTIONS
AND REPAIR PARTS
MANUAL FOR

PIRANHA

IRONWORKER
MODEL NUMBER
P2

Publication: September, 2012



For Serial Numbers
P2-
to Current Models

www.megafab.com
800-338-5471

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

Piranha Optional Tooling and Attachments

Enhance your Ironworker's Versatility

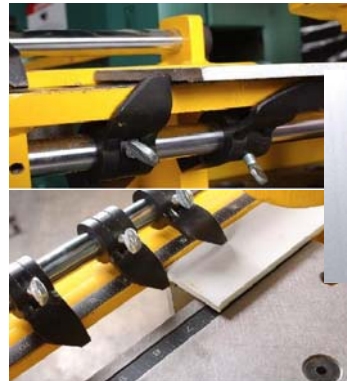
Oversize Punch Attachments

- Expand your punching capacity up to 3"



Quickset Gauging Table

- Allows you to quickly set-up your punch end for multiple holes.
- Includes an angle gauge bar to index off the heel of your angle and a plate gauge bar, which indexes off the end of your plate.
- Extensions are available in left and right hand styles in 5' and 10' lengths.



Backgauge

- Allows you to quickly set-up your machine to repeat your shearing length by adding a mechanical backstop.
- Backstop can be positioned in either the angle, flat bar, or round bar section of the machine.
- Available in lengths of 3', 6', 9', or 12'.
- An electronic version is also available, which cycles the machine automatically when material makes contact with the backgauge probe.



Pipe Notching Attachment

- Allows you to single notch Schedule 40 Pipe.
- A must have for handrail jobs.
- Attaches to the punch end of the machine.
- Notching dies available for 3/4", 1", 1-1/4", 1-1/2", and 2" Schedule 40 Pipe.
-



Oversize Bending Attachments

- Expand your bending capacity to 24" on most models, 12" on the P2
- Includes a 4-way die block for different thicknesses of material.



Additional Options Shown on Inside of Back Cover

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FOREWORD

This manual has been prepared for those persons who will operate and maintain the Piranha Ironworker. 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 based on a standard machine arrangement. Differences between the machine 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 Manufacturing will replace (F.O.B. our factory), or refund the purchase price for any goods which are defective in materials and workmanship within 12 months of date of purchase. The buyer must return the warranty registration card within thirty-(30) days of the purchase date, and at the seller's option, return 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's 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.

INTRODUCTION

The Piranha Ironworker is a compact hydraulically powered machine that shears, punches, bends, notches, and copes, all in a low silhouette, efficiently designed unit, resulting in minimal floor space requirements. The integral lifting point provides instant portability and the unit arrives fully assembled, requiring only the addition of hydraulic oil and electrical power to become fully operational. The platen has six 5/8-11 tapped holes giving a wide base for increased flexibility of attachment sizes. The shearing operation features an adjustable manual hold-down allowing the operator to clamp the work piece with a slight initial adjustment. All workstations are located approximately 42" off the floor for ease of operation.

The first part of this manual provides operations and maintenance instructions, including a section on troubleshooting various problems that may occur. The second part of this manual provides repair parts information and a complete parts list with 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 as well as assembly breakdowns to aid in disassembly and re-assembly for repair part installation.

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.

This machine was designed for use by a single operator only.

Wear eye protection at all times.

Use the proper voltage outlet for your machine.

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

CAUTION: *Do not remove guards.*

Keep hands off working tables and out of the path of moving parts during operation. Remove all material from the tables except for the work piece.

Remove all tooling from the punch end before starting shearing or coping operations.

Make sure that all tooling is properly held in position before starting any operation.

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

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 limit switches when punching or bending to allow 1/4" maximum clearance between bottom of the stripper foot or 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.

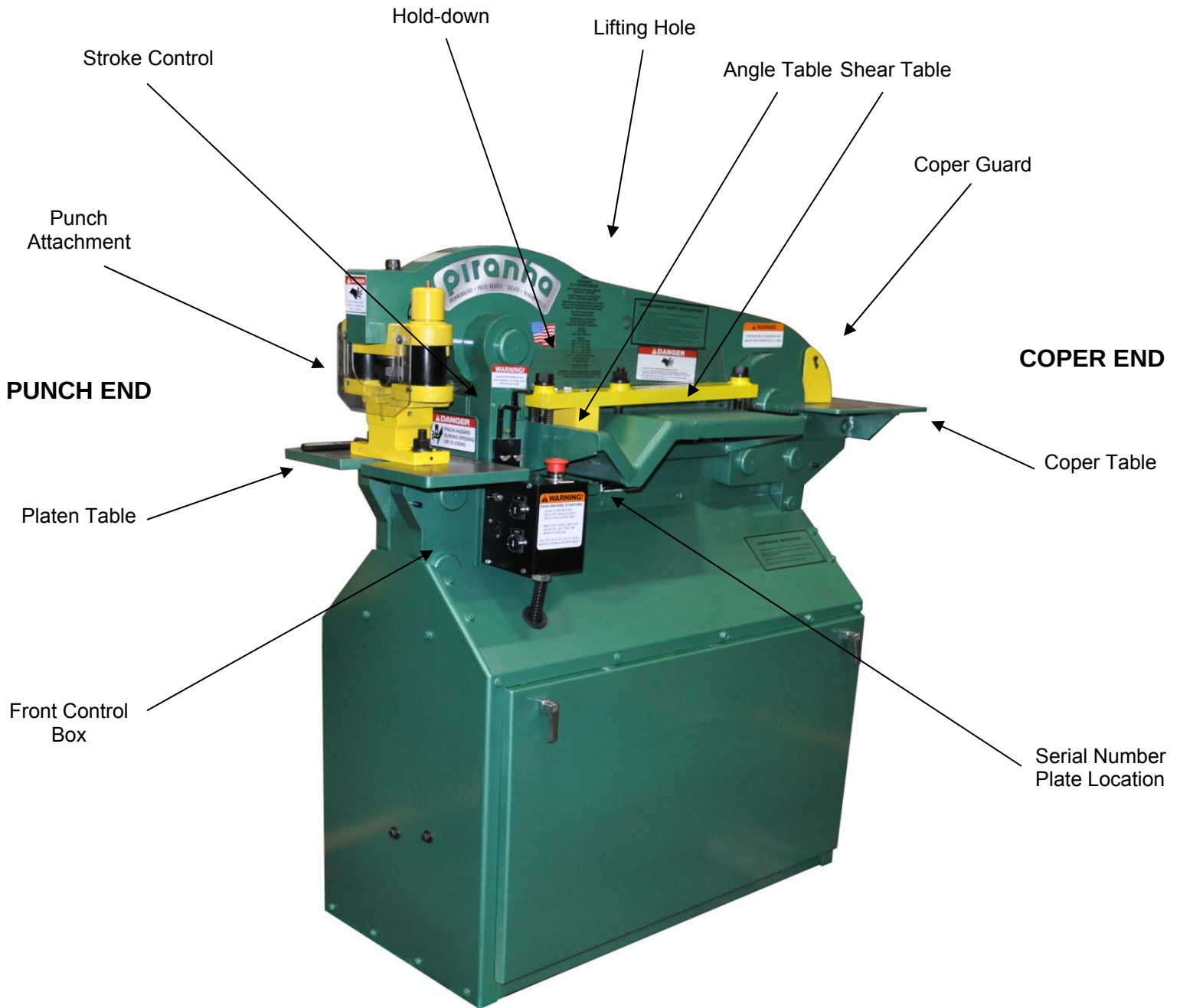
MACHINE SPECIFICATIONS

HYDRAULIC SYSTEM	
Drive Motor	3HP 230 / 460 Volt / 3 Phase
Hydraulic Tank Capacity	12 Gallons
Hydraulic Oil	Mobile DTE 13M or Equivalent (ISO Grade 32) Consult your local distributor for a cross reference
WORKING SURFACE	
Platen Table	8" x 16"
Coper Table	12" x 14"
CAPACITIES	
Punch	Maximum 13/16" Thru 3/4" thick material or 50 Tons
Bending	Maximum 50 Tons
Punch End	Maximum 50 Tons
Bar	1-1/2" Round or 1" Square
Plate	3/4" x 6", 1/2" x 10", or 1/4" x 13"
Angle	3" x 3" x 3/8"
Coper-Notcher	2-1/4" x 3" x 1/4"
WEIGHT	
Shipping Weight	1,700 Pounds

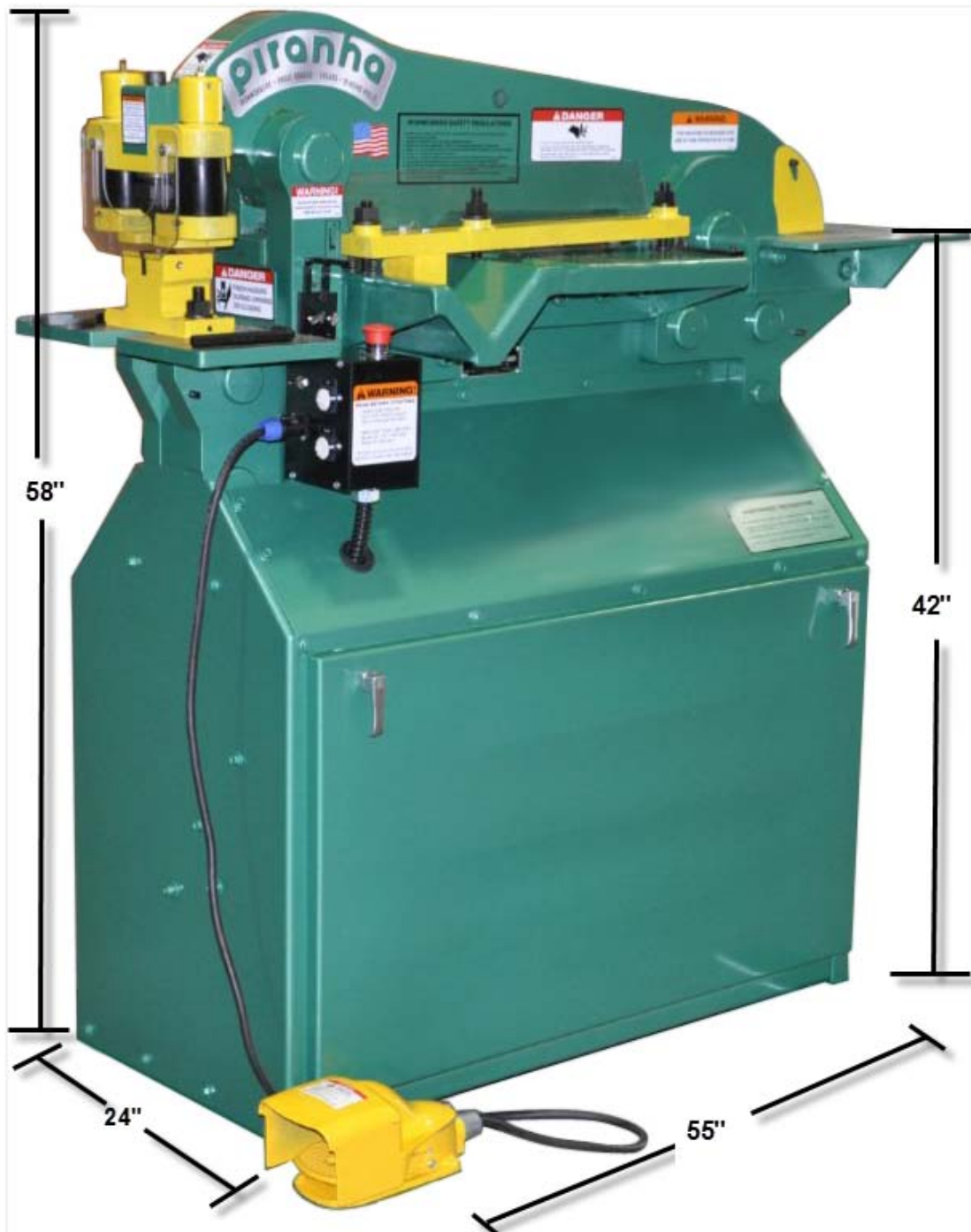
Rear Stop Box
(OFF SIDE)



FUNCTIONAL DIAGRAM



DIMENSIONAL DATA



Standards Compliance

Electrical System Design/Manufacture:

The machines manufactured in Rockford, Illinois, USA 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, and for installing, training, and using 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 4, 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 B 11.5-1988, 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 owners/end-users 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 1430 Broadway
New York, New York 10018 Telephone (212) 354-3300**

INSTALLATION

Location

For the best overall performance, install the Piranha in a location that is clean and well lighted. Provide sufficient space in all directions to allow for the material lengths of the work pieces 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 a load, the Piranha should be placed on a stable base or floor adequately constructed to withstand the unit weight. **NOTE: Use the leveling bolts provided with the machine.**

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 an electrical disconnect, or to install a cord and plug for mobility of the Piranha.

CAUTION: Compare machine wiring to input voltage *prior* to connecting power. Only connect the specified voltage to the machine.

Lifting

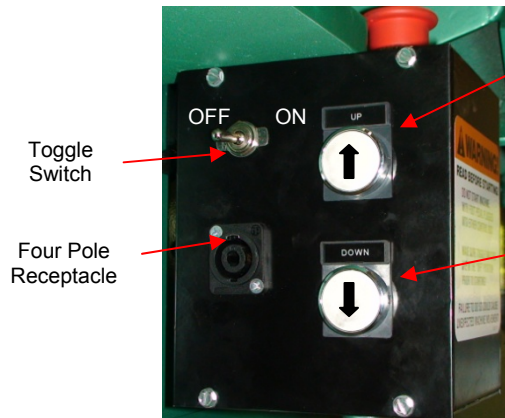
The lifting hole on the Piranha requires a Deep D-Ring Clevis to lift the machine. Use a device with adequate lifting capacity to handle the Piranha.

CAUTION: The unit is exceptionally **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. The only requirements are the addition of hydraulic oil and electrical power.

FIGURE "A"



Front Cover
Front and Rear
Control Boxes

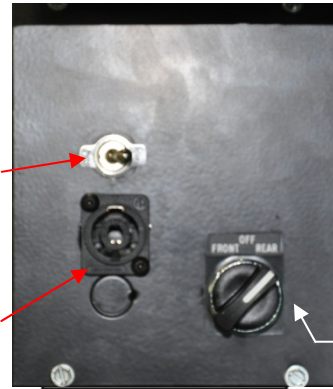
FIGURE "B"

Up Button
with Arrow

Toggle
Switch

Down
Button with
Arrow

Rear Foot
Receptacle



NOTE: Turn selector
switch to OFF position
when performing
maintenance or
changing tooling.

Selector Switch
Front- Rear

Rear Cover
Front Control
Box Only

FIGURE "E"
View Control Box
Locations

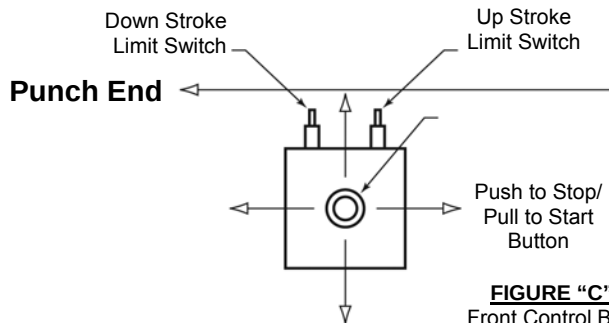


FIGURE "D"
Rear Control Box

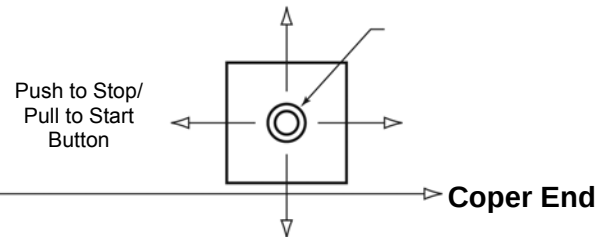
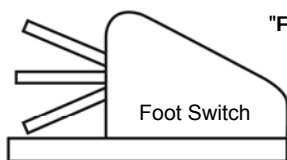
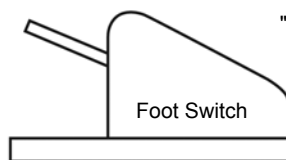


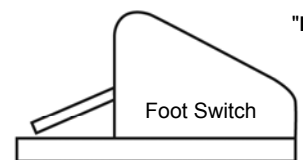
FIGURE "C"
Front Control Box



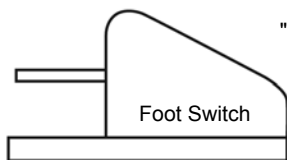
Foot Switch Lever Positions
1) Beam Moves Up
2) Beam is Stopped
3) Beam Moves Down



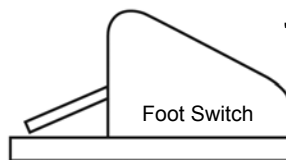
Foot Switch Lever
Full Up Position
Beam Elevates
To Limit Setting



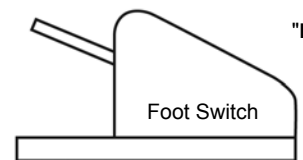
Foot Switch Lever
Depressed Past Center
Beam Moves Down
To Limit Setting



Foot Switch Lever
Neutral Position
Beam Travel
Is Halted



Foot Switch Lever
Depressed Past Center
Beam Moves Down
To Limit Setting



Foot Switch Lever
Full Up Position
Beam Elevates
To Limit Setting

OPERATING INSTRUCTIONS

(Refer to drawings on page 12)

The Piranha Ironworker comes pre-assembled and pre-wired, requiring only the addition of hydraulic fluid in the reservoir to the mark on the fill cap dipstick and a power source from a disconnect to the electrical enclosure box located inside the cabinet.

The unit can be started and stopped by the Emergency Stop Button operators located on the top of the control boxes on each end of the unit. (Reference Page 12, Figure "A"). For the Control Box locations, reference Page 12, Figure "E".

The electrical controls have a selector switch to determine which control box controls the unit. This safety feature is located on the rear cover of the front control box only, (reference Figure "B"). The legend plate on the selector switch is printed "Front-Rear". "Front" allows electrical control to the Front Box only. "Rear" allows electrical control to the Rear Box only. The Emergency Stop Button should be depressed when the machine is not being used, such as, changing tooling, maintenance work, etc. The machine can only be operated from the control box selected via the selector switch. It can be stopped using either "Emergency Stop" button.

Footswitch Operation

The ironworker can also be controlled by a footswitch (reference Figure "F"). The footswitch is used by plugging the 4-pole twist lock cap into the 4-pole twist lock receptacles located in the front cover and rear cover of the front control box (reference Figure "A" and "B"), and switching the toggle switch (reference Figure "A" and "B") from the "OFF" position to the "ON" position.

The footswitch is a three-(3) position switch allowing hands-free operation.

- By fully depressing the footswitch lever, machine movement is downward to limit setting (reference Figure F2).
- By allowing the footswitch lever to elevate to the center position, machine movement stops (reference Figure F3).
- Completion of downward cycle is accomplished by depressing footswitch lever again. Machine movement is down until limit setting is met (reference Figure F4).
- Removing foot pressure from the switch entirely allows machine movement upward to limit setting, completing upstroke cycle (reference Figure F5).

The footswitch is used in conjunction with the upstroke and down stroke limit switches located on the front control box only (reference Figure "C").

- The front limit switch (closest to the punch end and the lower switch of the two switches) controls the down stroke limit.
- The back switch (furthest from the punch end and the higher of the two switches) controls the upstroke limit.
- The limit switches are activated by the limit switch arms: reference part #'s shown on Page Number RP-5. To set the stroke using the limit switch arms, use the following procedure:

- 1) Plug in footswitch.
- 2) Turn toggle switch to "ON" position.
- 3) Loosen thumbscrew on down stroke limit-switch arm.
- 4) Fully depress footswitch lever allowing beam to move downward.
- 5) Slide limit switch arm until contact with the down stroke switch stops beam movement at the desired lower limit.
- 6) Tighten thumbscrew to hold limit switch arm firmly in place.
- 7) Loosen thumbscrew on upstroke limit-switch arm.
- 8) Allow footswitch lever to elevate allowing beam to rise.
- 9) Slide limit switch arm until contact with the upstroke switch stops beam movement at the desired upper limit.
- 10) Tighten thumbscrew to hold limit switch arm firmly in place.

NOTE: When punching or using the bending attachment, set upper and lower limits to allow for 1/4" maximum clearance between the bottom of the punch and the top of the work material. The setting will change when the work material thickness changes.

NOTE: The down stroke limit switch on the punch end controls the upstroke limit on the copier end. The upstroke limit is the only switch active when using the rear footswitch control. The operator controls the downstroke limit by allowing the footswitch lever to fully elevate after the upper copier knife passes through the material.

PUNCH ATTACHMENT ALIGNMENT

The alignment of the punch and die should be accomplished in the following manner. (Reference pages RP-2 and RP-9).

1. Bolt the punch stripper assembly on the upper beam.
2. Tighten the 5/8" x 6" cap screw clockwise (requires 1/2" Allen wrench). This locks the stripper assembly firmly in place.
3. Remove the coupling nut from the punch stem using the coupling wrench.
4. Insert the punch in the coupling nut and tighten on the punch stem using the coupling wrench.
5. Insert the female die in the die block.
6. Tighten the setscrew against the female die (requires 3/16" Allen wrench).
7. Slide the die block around the setscrews on the platen table. **Do not** tighten the flanged nuts.
8. Push the Emergency Stop Button (reference Figure "E") to turn "OFF" the machine. Disconnect the foot switch from the receptacle.
9. Start the machine. Use the front control box down push button (reference Figure "A"), to move the beam downward. Stop beams movement when the bottom of the stripper foot is approximately 1/8" above the die block.
10. Align the punch and die visually and by hand movement of the die block. Jog down again slightly and align. Continue this procedure until the punch has passed through into the die.
11. Using the wrench supplied with the machine, tighten the flanged nuts on the setscrews to hold the die block firmly to the platen table.
12. Set the limit switches to control the length of stroke (reference procedures previously listed).
13. Start operation.

STRIPPER ASSEMBLY ADJUSTMENT

NOTE: The Emergency Stop Button should be pushed "OFF" until all tooling changes are complete. (Reference Page 12, Figure "C".)

The adjustment of the stripper assembly to compensate for varying punch lengths should be accomplished in the following manner. (Reference Page RP-9 for a visual reference).

NOTE: The correct adjustment should have the tip of the punch 1/16" below the bottom of the stripper footplate and the stripper footplate level.

1. Install the stripper assembly on the upper beam (reference instructions previously listed).
2. Insert punch in the stripper assembly (reference instructions previously listed).
3. Measure the length of the punch relative to the bottom of the stripper foot.
4. If the tip of the punch extends more than 1/16" below the bottom of the stripper foot, adjustment is required.
5. Turn the two (2) guide pin adjusting caps *counter clockwise* until the tip of the punch extends 1/16" below the bottom of the stripper foot. The stripper foot **MUST** remain level or parallel to the work material. The punch tip should be able to line up on a center punch mark before the stripper foot engages the material.
6. If the tip of the punch does not extend 1/16" below the bottom of the stripper foot, or if the stripper foot is not parallel with the work material, adjustment is required.
7. Turn the two (2) guide pin adjusting caps *clockwise* until the tip of the punch extends 1/16" below the bottom of the stripper foot. The stripper foot **MUST** remain level or parallel to the work material. The punch tip should be able to line up on a center punch mark before the stripper foot engages the material.
8. Tighten down the 1/4-20 ball plungers to.

(OPTIONAL) BENDING ATTACHMENT ALIGNMENT

The alignment of the bending punch and bending die should be accomplished by the following manner.

1. Align and bolt the bending punch assembly on the punch end of the machine.
2. Slide the bending die base around the set screws on the platen table, DO NOT TIGHTEN the 5/8" flanged nuts.
3. Start the machine by pulling both Emergency Stop Buttons up, using the Down Push Button move the beam downward.
4. When contact between the bending punch and the bending die block opening is made, the bending die block will center itself.
5. Tighten the 5/8" nuts to hold die block firmly to the platen table.
6. Start operation.

SHEAR/ANGLE HOLD-DOWN ASSEMBLY ADJUSTMENT

The adjustment on the hold-down assembly should be accomplished by the following manner. (Reference Page RP-6)

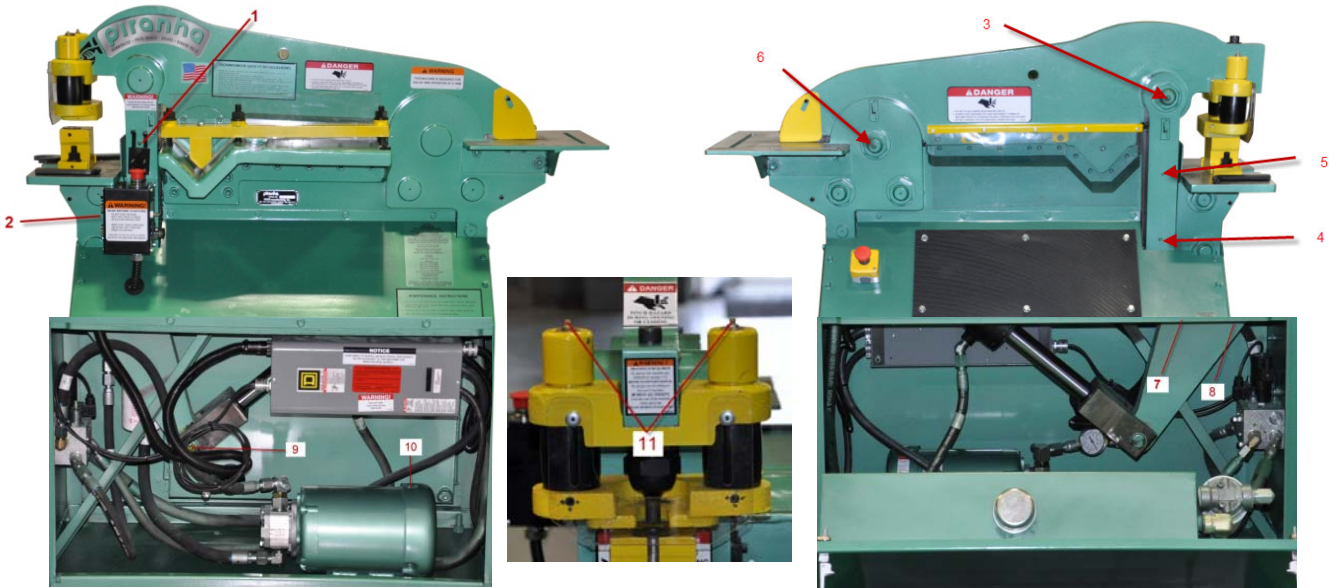
1. Raise the upper beam to its full upstroke limit.
2. Loosen the (3) 5/8" flanged nuts without removing them from the studs.
3. Insert material to be sheared under the hold down assembly.
4. Tighten the flanged nuts to allow 1/16" to 1/8" clearance between the hold down bar and material.

NOTE: Do not attempt to shear any material that will not be held by the Hold-down Assembly.

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 CHART

Station	Part Lubricated	Frequency	Instructions	Type Lube
1	Upper Pull Arm Material Feed Side	Every 40 Hours Or Weekly With Normal Use	Apply Grease Until It Appears Around the Edge Of Parts	Mobile MP Or Any Multi-Purpose Grease
2	Lower Pull Arm Material Feed Side			
3	Upper Pull Arm Hinge Pin Material Drop Side			
4	Lower Pull Arm Material Drop Side			
5	Upper Pull Arm Material Drop Side			
6	Rear Hinge Pin Off Side			
7	Lower Pull Arm Hinge Pin Material Drop Side			
8	Crank Arm Hinge Pin Material Feed Side			
9	Clevis Pin Material Feed Side			
11	Stripper Assembly (2 places)			
10	Drive Motor	Once shot per year	One Shot From Grease Gun	Multi-Purpose Grease

MAINTENANCE

NOTE: The Emergency Stop Button should be pushed "OFF" while maintenance checks are being performed. Reference Page 12, Figure "C".

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 three-(3) months, depending on workload and environmental conditions. The element should be changed after the first 40 hours of use. The filter housing is mounted at the tank door inside the machine. Reference: Repair Parts List for reordering instructions and the item number.

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 table on Page 27.

Check all hydraulic hose and fitting connections for tightness when lubricating the machine. We recommend you use Loctite hydraulic sealant or an equivalent product on all connectors.

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

HYDRAULIC OIL LEVEL

Your Piranha ironworker is equipped with a dipstick indicator on the fill cap located inside the access door. The dipstick is not marked oil should just touch the bottom of the dipstick for proper fluid level. This should be checked as part of your normal maintenance cycle.

NOTE: We recommend that you implement a weekly maintenance program to inspect and lubricate your Piranha. For your convenience, a service record chart has been provided on Page RP-23.

TROUBLESHOOTING

The following material is a trouble-shooting guide to be followed by maintenance personnel should a problem occur with your machine. Many of these problems can be solved in your shop by following a step-by-step procedure for isolating the deficiency. If the deficiency cannot be isolated and corrected in your shop, any information regarding your effort to isolate the area should be related to the service technician at Mega Manufacturing, Inc. to assist him in finding a solution. These efforts will assure restoring your machine to full operational status with the minimum amount of downtime.

POTENTIAL PROBLEMS AND SOLUTIONS

P1 - MACHINE WILL NOT START

1. Ensure that both Emergency Stop Buttons are pulled up to start.
2. Check fuses at disconnect.
3. Check voltage to motor starter.
4. Transformer control voltage (Output - 120 V). If not, check:
 - A. Transformer fuse. If blown, inspect circuit for a ground short.
 - B. Incoming voltage to input side of transformer is correct and the jumper bars are in the correct location. Reference page RP-11.
 - C. All wire and fuse holder connections are tight.
 - D. Possible faulty transformer.
5. Control circuit from transformer to front and rear control boxes to motor starter coil. (Reference Wiring Diagram page RP-11).

P2 - MACHINE STARTS BUT WILL NOT OPERATE

Determine if the problem is electrical or hydraulic by using the manual override buttons located on the directional valve. (Refer to Page RP-14).

If the machine operates, the problem is electrical. Follow the procedure below:

1. Determine if problem exists in the front control box only, the rear control box only, or in both control boxes.
 - A. If problem is isolated to one box only, check the internal wiring and wiring harness with disconnect plug for loose connection.
 - B. If the problem exists in both boxes, follow the remaining procedures.
2. Check wiring connections in the electrical enclosure.
3. Check the valve body wiring harness, including the disconnect plugs, for loose connections.
4. Check coils in the directional control valve.

If the machine does not operate on manual override, the problem is hydraulic.

1. Check to determine if the pump is developing flow. If not:
 - A. See if motor rotation is correct.
 - B. Check motor / pump key is not damaged.
 - C. Check hydraulic suction line for tightness.
 - D. Check Oil level.
 - E. If the above checks out okay, the pump may be defective
2. Check to determine if the spool in the directional control valve is stuck in the center position. If the valve is stuck, remove the directional control valve and free the spool. Inspect for contamination.

P3 - MACHINE OVERHEATS

1. Check if fluid level in reservoir is low.
2. Check for low line voltage to transformer, causing low control voltage to directional valve solenoid coils.
3. Determine if limit switches are set improperly when using footswitch, allowing cylinder to bottom out at retraction and extension. This may cause hydraulic fluid to by-pass over relief valve, creating heat buildup.
4. Check for restrictions in the hydraulic system. Example: Contaminated cartridge valve, restricted or kinked hose, etc.

P4 - RESET ON MOTOR STARTER KICKS OUT

1. Internal overheating. Refer to P3, above, for troubleshooting procedure.
2. Insure proper sized heater coils are being used. (Reference the wiring diagram on Page RP-11).
3. Check for proper line voltage.
4. Check for loose connections on motor cable at starter or motor.

P5 - EDGES ON KNIFE BLADE CHIPPED BY MATERIAL

1. Check knife clearance - .007" to .010". If not:
 - A. Combo table bolts may have become loose, allowing scale and contamination between table and beam. Remove table and clean.
 - B. Combo table bolts may have stretched the threads in the beam. Remove table and sand beam surface flat.
 - C. Knives may have been ground. Shim to recommended clearance.
2. Knives may be dull and are creating a pulling effect on the shearing edge.
3. Material may be too hard.
4. Material may be thicker than rated capacities.

P6 - MACHINE LEAVES BURR WHEN SHEARING

1. Knife clearance: .007" to .010". If not, follow procedure in P-5.
2. Check shear knives for sharpness
3. Check that the automatic hold-down is adjusted to clamp the material securely.

P7 – MACHINE DOES NOT SEEM TO HAVE ENOUGH PRESSURE TO PUNCH OR COPE

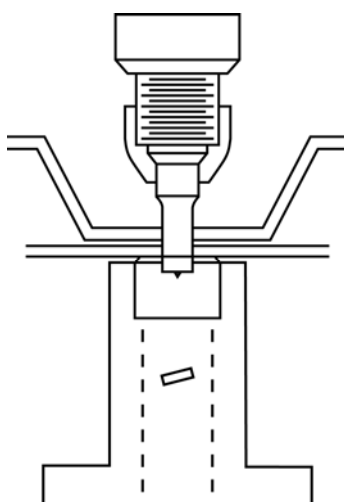
Install a 3000 PSI pressure gauge into the system at the pump outlet. Then bottom out the punch end (cylinder extension). The pressure should read 2700 PSI. The coper end bottom out (cylinder retraction) should read 1000 PSI.

1. If pressures are good, check:
 - A. Tonnage rating of the hole to punch (See page 24).
 - B. Type of material being punched. Machine capacities are rated on mild steel. Note: Torching some metals increase their hardness.
 - C. Proper punch to die clearance on material thickness (See page 25).
 - D. If punch and die are in good shape.
2. If pressures are low check:
 - A. Pressure gauge is giving accurate reading.
 - B. Check cylinder for internal leak or (1) for low punch pressure check punch relief valve for contamination (See page RP14); (2) for low coper pressure check coper relief valve for contamination (See page RP14).

Note: Relief valve operating pressure may need reset. Contact factory technician for adjustment procedure.

Remove pressure gauge when trouble shooting is completed.

TONNAGE REQUIRED FOR PUNCHING HOLES IN MILD STEEL



This table shows the tons of force required for punching round holes in mild steel derived by the formula:

Force = hole diameter x material thickness x constant 80.
All figures shown are in U.S. tons.

For holes larger than 1 inch, the punching force can be calculated per the following example:

What pressure is required to punch a 2-1/4" round hole in 7/8" thick material?

Since a 1" round hole in 7/8" thick material requires 70 tons of pressure, multiply this 70 tons x 2.25 = 157.50 tons.

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

Material Thickness	Punch Size														
	1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4	13/16	7/8	15/16	1
3/32	1	1	2	2	3	3	4	4	5	5	5	6	7	7	8
1/8	1	2	3	3	4	4	5	6	6	7	8	8	9	9	10
3/16		3	4	5	6	7	8	9	9	10	11	12	13	14	15
1/4			5	6	8	9	10	11	13	14	15	16	18	19	20
5/16				8	9	11	13	14	16	17	19	20	22	23	25
3/8					11	13	15	17	19	21	23	24	26	28	30
7/16						15	18	20	22	24	26	28	30	33	35
1/2							20	23	25	28	30	33	35	38	40
9/16								26	28	30	34	36	40	42	45
5/8									31	34	38	41	44	47	50
11/16										38	41	44	48	51	55
3/4											45	49	53	56	60
13/16												53	57	61	65
7/8													61	66	70
15/16														71	75
1															80

MAINTENANCE TOOLS LIST

The following tools are required for performing maintenance and to assist you in troubleshooting your machine:

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 Nuts	600

DIE CLEARANCE CHART FOR STEEL

Gauge	Decimal Thickness	Die Clearance (Add to Punch Size)
13 thru 11	0.089 – 0.125"	0.01"
10 thru 7	0.126 – 0.190"	1/64" (0.016")
Over 7 thru 1/2" Plate	0.191 – 0.500"	1/32" (0.032")
Over 1/2" Plate	Over 0.500"	1/16" (0.063")

ORDERING REPAIR PARTS FOR A PIRANHA

The following assembly parts lists are shown in four columns. In the first column are the index numbers of the parts illustrated. The second column contains the Mega Manufacturing part number, followed by the description in the third column. The last column shows the quantity of parts required for the assembly.

Electrical wiring diagrams and hydraulic diagrams are shown with the Piranha part numbers. Some of these items shall be considered as an assembly and only one part number will be given, even though they are comprised of component parts.

You will receive quicker service when ordering repair parts by adhering to the following procedure.

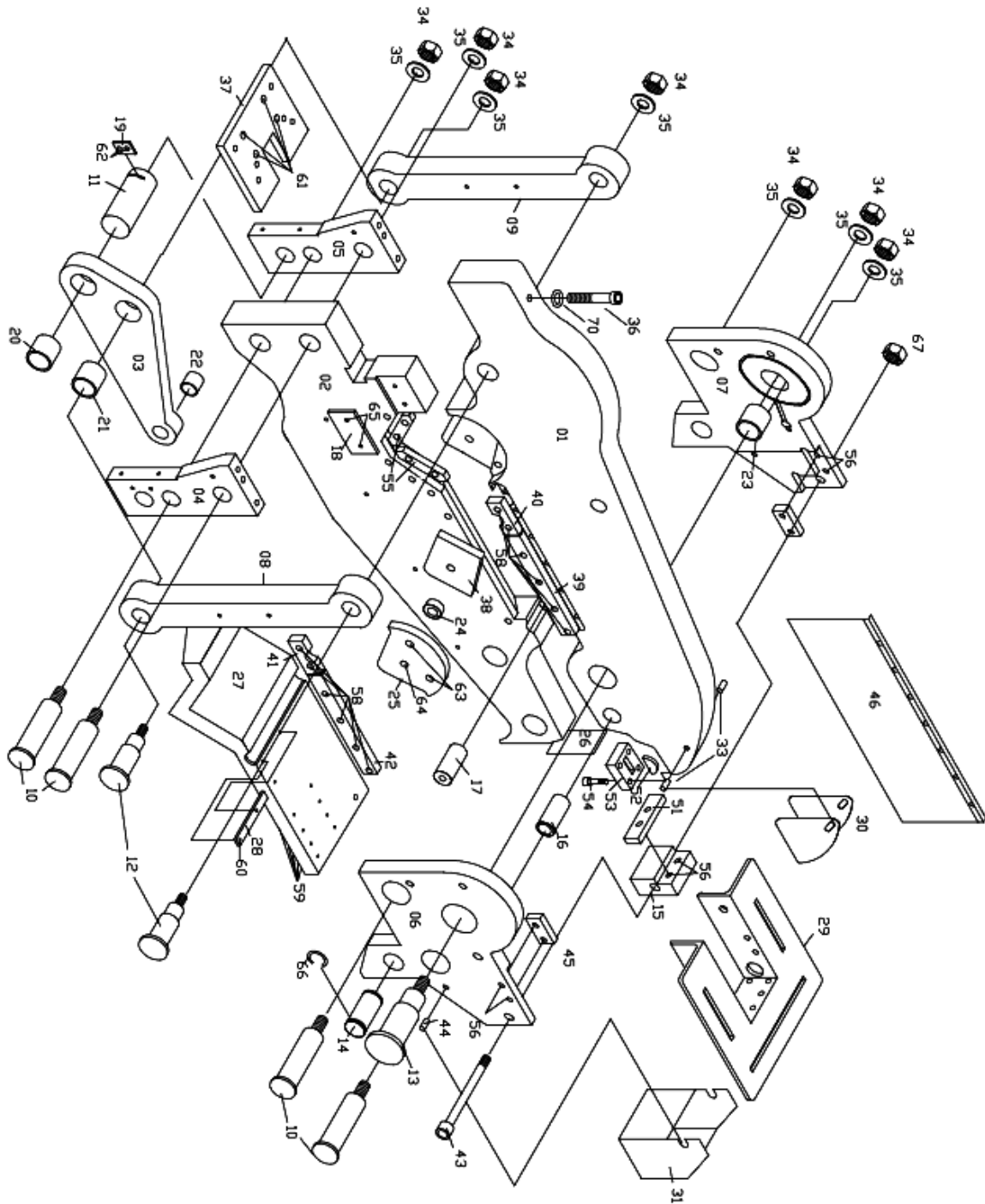
1. Provide the complete serial number of the machine. The machine serial number is stamped on the nameplate and is located on the right hand side of the machine (when facing the punch end).
2. Provide part number, description, and the quantity of parts that you require.
3. Specify each individual piece required. Do NOT use the term "complete assembly".
4. Specify how and where to ship. Define the method of transportation desired. UPS, Old Dominion, and FedEx Freight, are the most frequently used carriers at Mega Manufacturing.

**ALWAYS PROVIDE THE COMPLETE SERIAL NUMBER
FOR PARTS AND SERVICE**

REPAIR PARTS ILLUSTRATIONS

	Page No.
Basic Machine.....	RP-3
Shear Hold-down Assembly.....	RP-6
Punch Assembly	RP-8
Electrical Enclosure	RP-10
Wiring Diagram	RP-11
Front Control Box.....	RP-12
Rear Control Box	RP-13
Valve Body Assembly	RP-14
Motor, Filter, and Pump Assembly	RP-16
Cylinder.....	RP-17
Foot Pedal Assembly	RP-18
Knives (No Illustration).....	RP-19
Service Record Chart.....	RP-20

P2 BASIC MACHINE



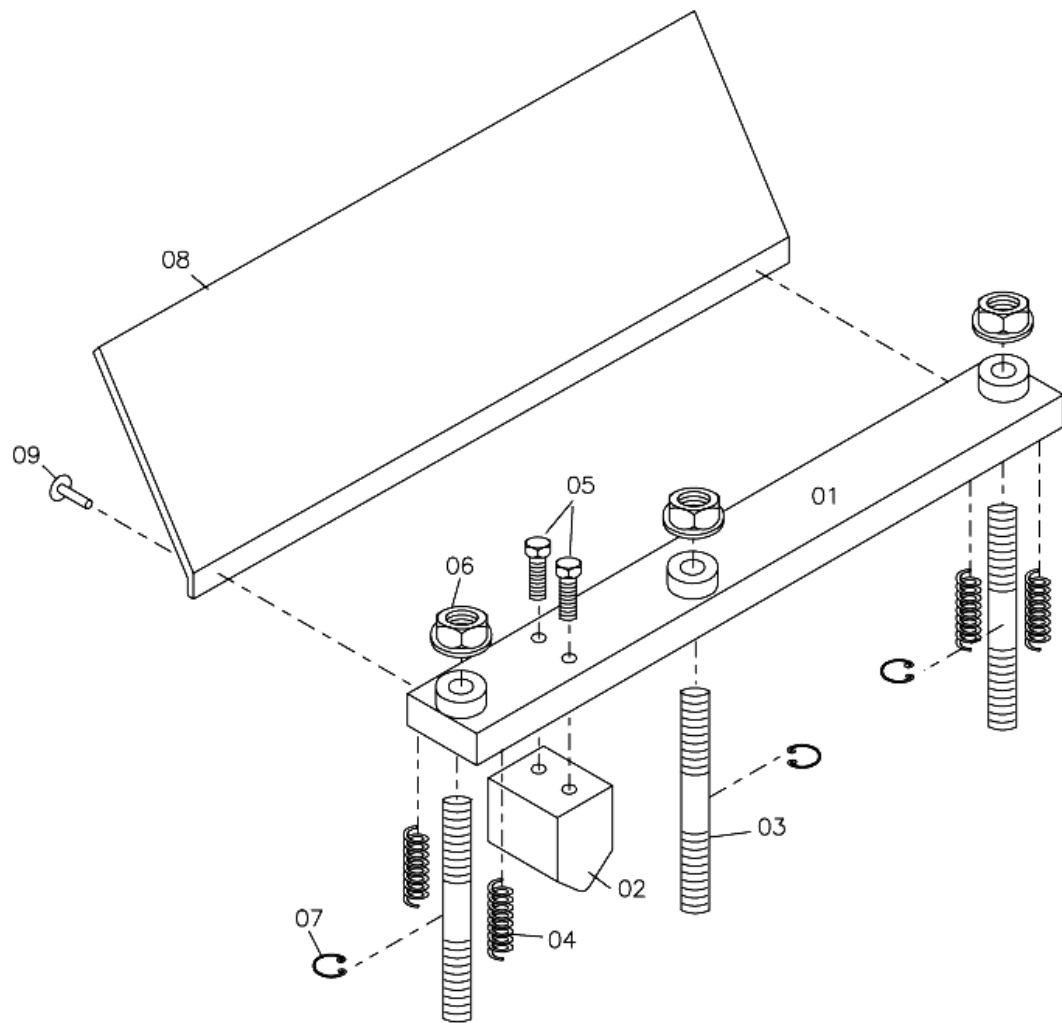
P2 BASIC UNIT

Figure And Index No.	Part Number	Description	Qty.
1	0220100	Upper Beam Assembly	1
2	02201011	Lower Beam Assembly	1
3	0220112	Crank Arm Assembly	1
4	0220113	Platen Support-On Side	1
5	0220114	Platen Support-Off Side	1
6	0220115-1	Coper Side Plate-On Side	1
7	0220116-1	Coper Side Plate-Off Side	1
8	02201101-1	Pull Arm-On Side	1
9	0220111	Pull Arm-Off Side	1
10	0220160	Machine Pin	4
11	0220164	Crank Arm Hinge Pin	1
12	02201651	Pull Arm Hinge Pin	2
13	0220166	Rear Hinge Pin	1
14	0220172	Cylinder Pin	1
15	0220117-1	Coper End Knife Support	1
16	0220155	Black Pipe Spacer	1
17	0220154	Urethane Spacer	1
18	0220145	Bronze Wear Plate	1
19	0230148	Crank Arm Pin Lock Plate	1
20	0320168	Crank Arm Bushing	1
21	0320168	Crank Arm Bushing	1
22	0531372	P 125-121 1/4" x 1-1/2" x 1-1/2"	1
23	0320170	Rear Hinge Pin Bushing	1
24	0220167	Angle Knife Bushing	1
25	0220146	Angle Knife Cover	1
26	0321409	Coper End Filler Pit	1
27	0220122	Combo Shear Table	1
28	0220140	Plate Shear Guide	1
29	0220124	Coper Table Assembly	1
30	0220142	Coper Guard Assembly	1
31	0220143	Chip Bucket (optional)	1
32	N/A	Long Reach D-Shackle (not shown)	1
33	0531351	3/8" x 1" Roll Pin	2
34	0521270	1-1/2" NF Jam Nut	7
35	0531303	1.535" I.D. x 3" O.D. x .255" Washer	7
36	0531095	5/8" x 4-1/2" SHCS	1
37	0220120-1	Platen Table	1

P2 Basic Unit – Continued

Figure And Index No.	Part Number	Description	Qty.
38	0220275	Upper Angle Knife	1
39	0220250	"10" Flat Shear Knife"	1
40	0220270	Round Bar Knife Blank	2
41	(Page RP 16)	Round Bar Knife (optional)	2
42	0220250	"10" Flat Shear Knife"	1
43	0531097	5/8" x 6-1/2" SHCS	2
44	0531352	1-1/2" x 1-1/2" Roll Pin	2
45	0220278	Lower Coper Side Knives	2
46	0372415	Shear Guard	1
47	0330128	Coper Table Guides (optional not shown)	3
48	0531715	KP 79 (1/2-13) Plastic Handle (optional not shown)	3
49	0531307	1/2" Flat Plated Washer (optional not shown)	3
50	0531088	1/2" x 1-1/2" Carriage Bolt (optional not shown)	3
51	0220276	Lower Coper End Knife	1
52	0531050	3/8" x 2-3/4" T Woodruff Key	1
53	0220277	Upper Coper End Knife	1
54	0531050	3/8" x 1" SHCS	4
55	0220274	Lower Angle Knives	2
56	0531250	5/8" Nylock HN	2
57	0531086	1/2" x 1-3/4" SCHS	2
58	0531069	7/16" x 1-1/2" SHCS	6
59	0531092	5/8" x 2-1/4" SHCS	9
60	0531000	1/4" x 1/2" SHCS	2
61	0531106	5/8" x 1-1/2" FHCS	4
62	0531060	3/8" x 3/4" HHCS Grade 8	2
63	0531081	1/2" x 1-1/4" SHCS	2
64	0531090	5/8" x 1-1/2" FHCS	1
65	0513062	3/8" x 3/4" FHCS	2
66	0531340	5103-125 Snap Ring	2
67	0531071	7/16" x 2" SHCS	10
68	0531071	7/16" x 2" SHCS	2
69	0531069	7/16" x 1-1/2" SHCS	4
70	0521047	5/8" Flat Washer	1
Not Pictured	0230153-1	Microswitch Arm Assembly	2
Not Pictured	0230149	Microswitch Guide Block	1

P2 SHEAR HOLD-DOWN ASSEMBLY
PART NUMBER 0220200

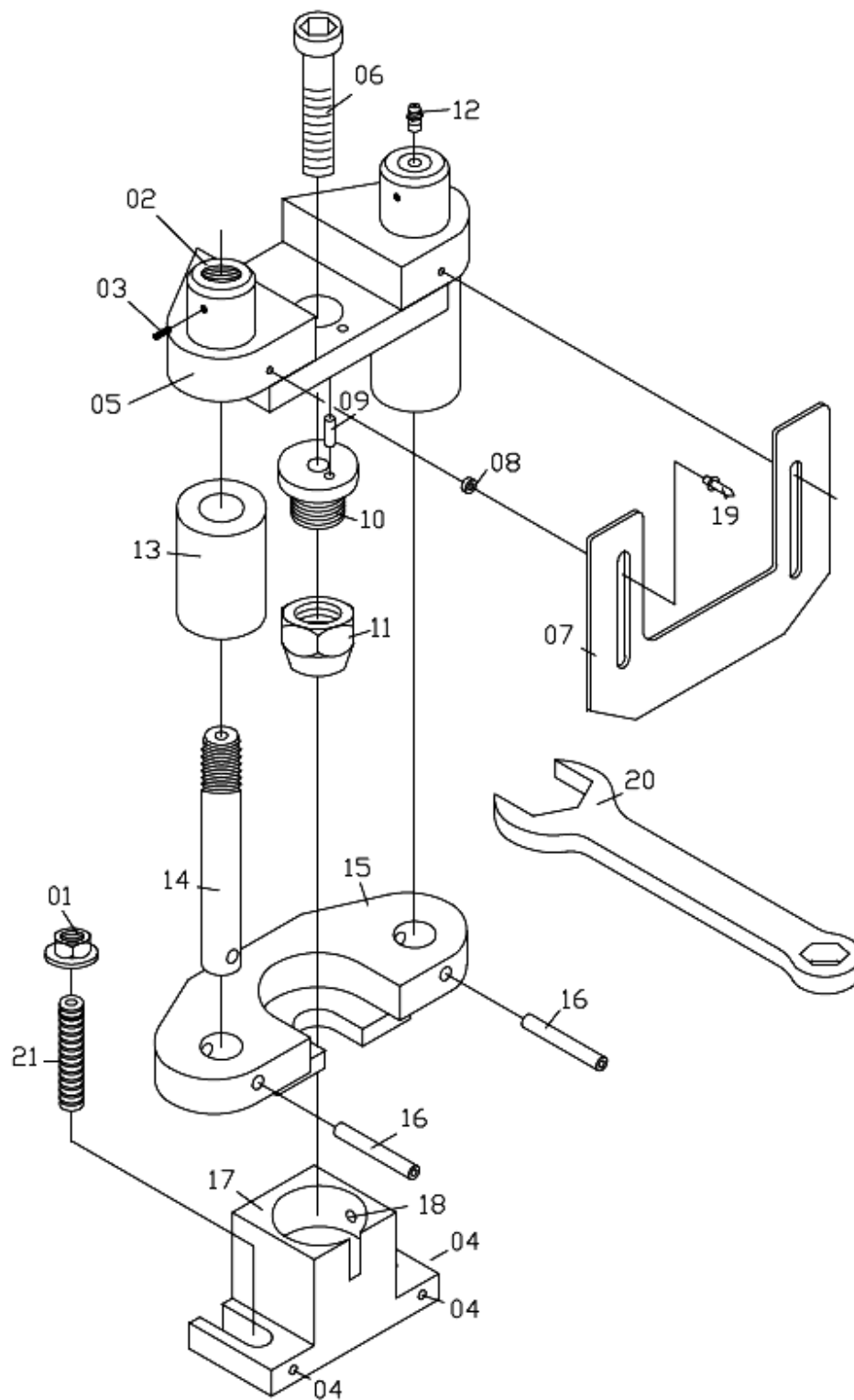


P2 HOLD DOWN ASSEMBLY
PART NUMBER 0220200

Figure And Index No.	Part Number	Description	Qty.
1	0320200	Hold Down Bar	1
2	0320204	Angle Block-Hold Down	1
3	0320201	5/8" x 4" Stud W/Groove	3
4	0320208	Hold Down Springs	4
5	0521025	3/8" x 1-3/4" HHCS	2
6	0531251	5/8" Flanged Nuts	3
7	0520155	Snap Ring	3
8	0220203	Hold Down Guard	1
9	0531012	Rivet	2

NOTE: Hold Down Assembly, Number 0220200, Includes Index Numbers 1, 2 and 5.

P2 PUNCH ASSEMBLY



P2 PUNCH ASSEMBLY
PART NUMBER 02204101

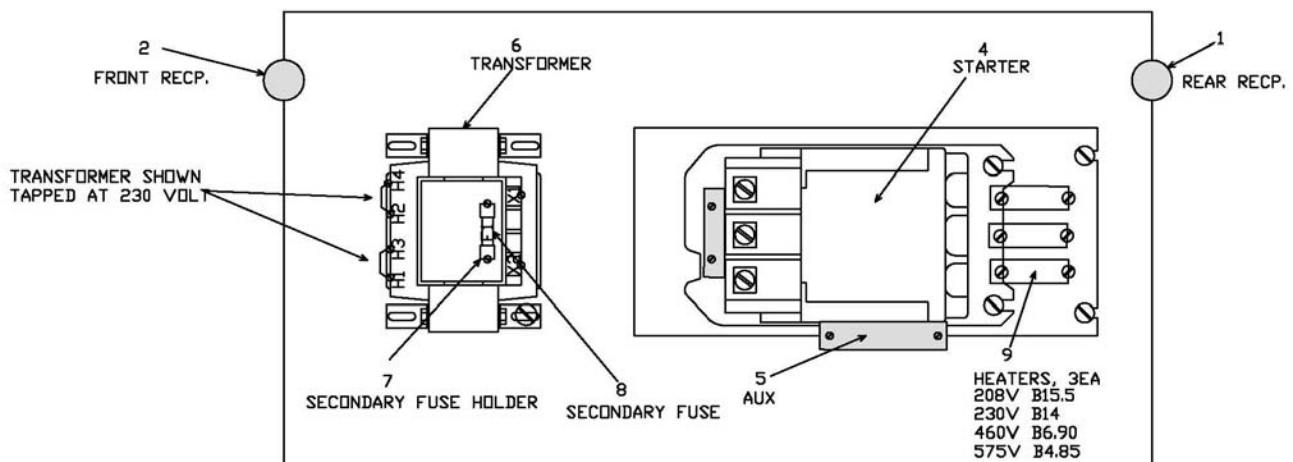
Figure And Index No.	Part Number	Description	Qty.
1	0531251	5/8" CL-4 FLDG Nut	2
2	0340408	Stripper Guide Pin Adjust Cap	2
3	0541045	W-17N Ball Plunger 1/4-20	2
4	0531002	1/4" x 3/4" SSS	3
5	03204101	Punch Slide Machined	1
6	0531097	5/8" x 6-1/2" SHCS	1
7	0330400	Punch Guard	1
8	0531013	Punch Guard Spacer	2
9	0531350	1/4" x 3/4" Roll Pin	1
10	02204071	Punch Stem	1
11	0330406	Coupling Nut	1
12	0531360	1610 Zerk	2
13	0330403	Stripper Block	2
14	03304021	Stripper Guide Pin	2
15	03304011	Stripper Foot Cast	1
16	0531356	3/8" x 2-1/2" Spiral Pin	2
17	022040011	Die Block	1
18	0531055	3/8" x 1/2" SSS	1
19	0531012	Punch Guard Rivet	2
20	0231410	2" Coupling Wrench	1
21	0531100	5/8" x 3" SSS	2

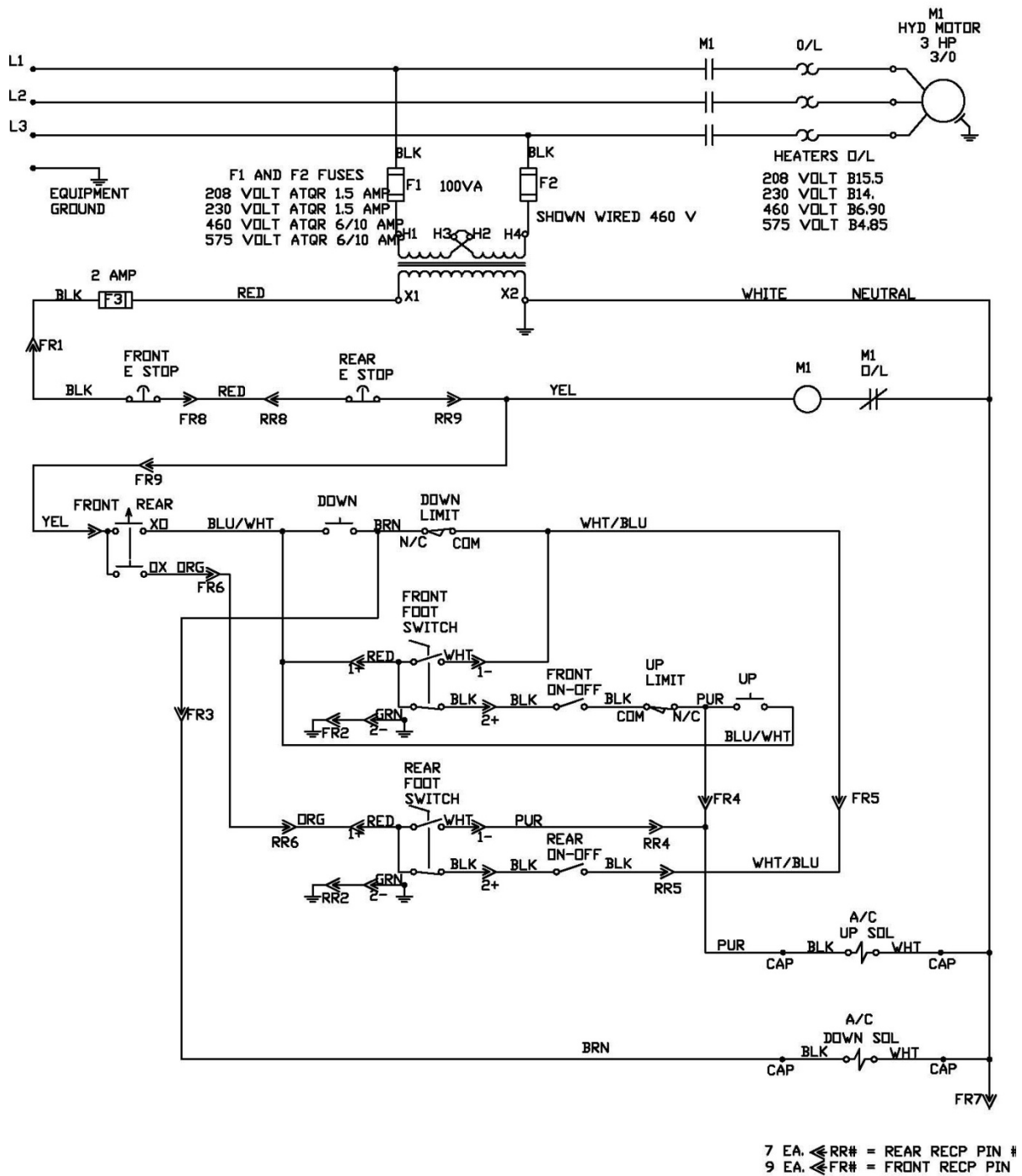
NOTE: Punch Assembly, Part Number 02204101- Includes Index Numbers 2, 3, 5, 7-16 and 19.

P2 ELECTRICAL ENCLOSURE ASSEMBLY

PART NUMBER 02316402-5

Figure And Index No.	Part Number	Description	Qty.
1	0521634	Rear Wiring Harness Receptacle	1
2	0521634	Front Wiring Harness Receptacle	1
4	0521641	Starter	1
5	T2253	Auxiliary Contact	1
6	05316261	220 / 440 Volt Transformer	1
- or -	05316271	575 Volt Transformer	1
- or -	05316281	208 Volt Transformer	1
7	05316221	Fuse Block	1
8	0531606	MDX3 Fuse	1
9	0531635	220 Volt Heater Coil B-15.5	3
- or -	0531810	440 Volt Heater Coil B-6.9	3
- or -	0531811	575 Volt Heater Coil B-4.85	3



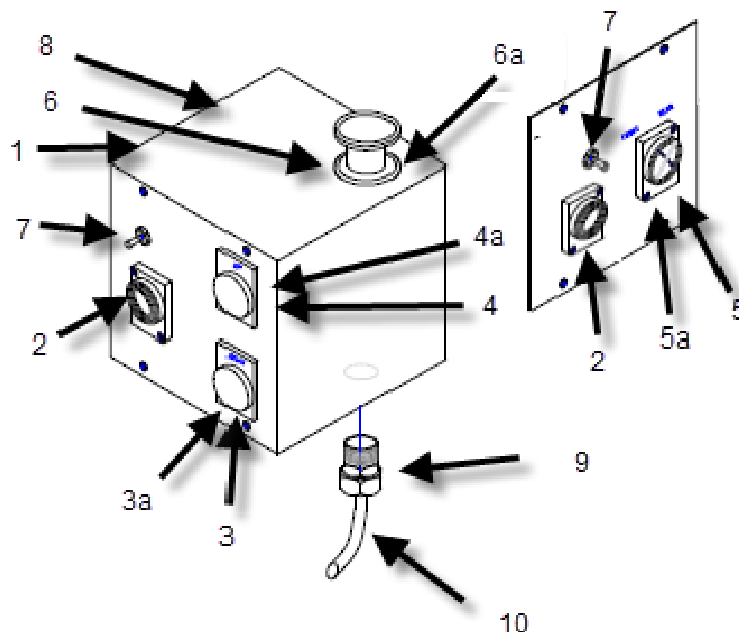


P2 FRONT BOX ASSEMBLY

PART NUMBER 02316292-5

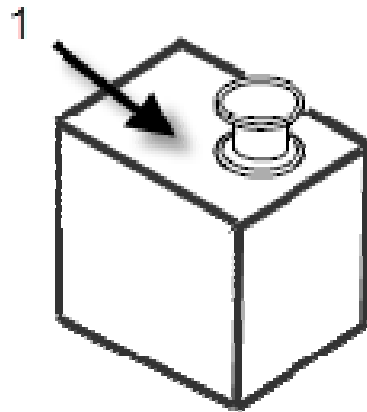
Figure And Index No.	Part Number	Description	Qty.
1	05316291	Front Control Box - With Covers	1
2	0531618	4 Pole Receptacle	2
3	?	Down Button	1
3a	0531696-1	Contact Block w/base, N.O. ZB4BZ101*	1
4	?	UP Button	1
4a	0531696-1	Contact Block w/base, N.O. ZB4BZ101*	
5	05316451-1	Selector Switch ZB4BD3	1
5a	0531678-1	Mounting Base with 2 each N.O. Contacts ZB4BZ103*	1
6	0531643-1	Push/Pull Mushroom Button	1
6a	05316121-1	Contact Block w/base, N.C. ZB4BZ102*	1
7	0531619	Toggle Switch	2
8	0531616	Microswitch	2
9	0531654	Liquid Tight Connector, 3/8"	1
10	0531657	JIC Grey Conduit	1
	05316781-1	Contact Block N.O. ZB4BE101	
	0531596-1	Contact Block N.C. ZB4BE102	

* Replacement contacts for item number 5a requires 2 each of part number ZB4BE101 part # 05316781-1. Item Number 3a and 4a requires 1 each. Replacement contact for item #6a 1 each of 0531596-1.



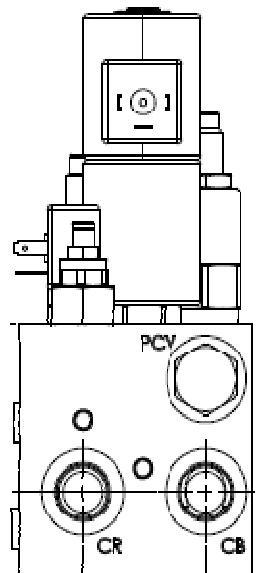
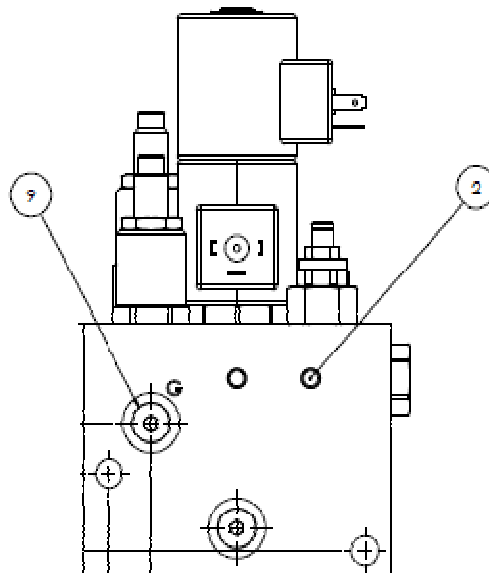
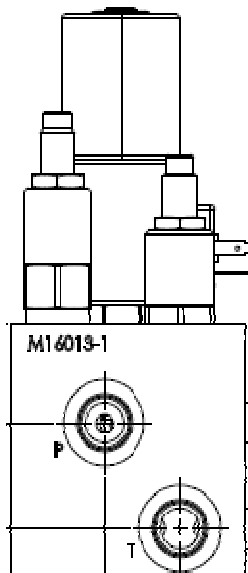
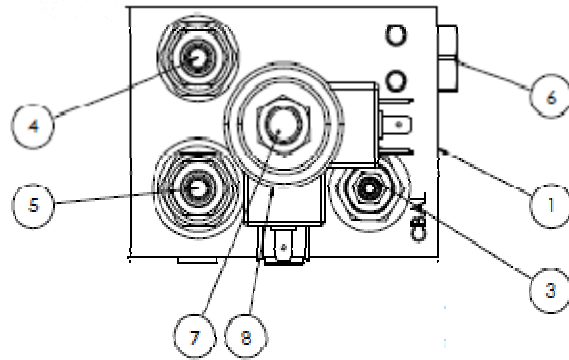
REAR BOX ASSEMBLY
PART NUMBER 02316302-6

Figure And Index No.	Part Number	Description	Qty.
1	02316602-6	Rear E-Stop Box	1



VALVE BODY ASSEMBLY

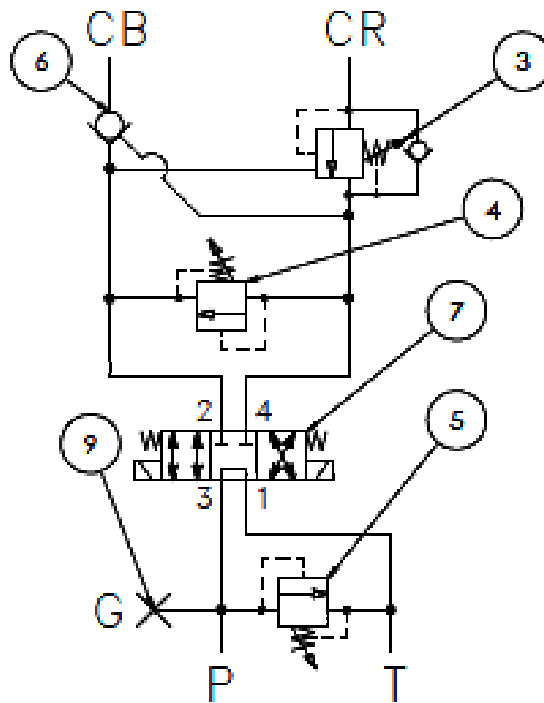
PART NUMBER 0231530-5



VALVE BODY ASSEMBLY

PART NUMBER 0231530-5

Figure And Index No.	Part Number	Description	Qty.
1	0531812	Valve Body Assembly	1
2	0531813	Expander Plug	1
3	0531814	Counterbalance Valve	1
4	0531815	Coper Relief Valve	1
5	0531816	Punch Relief Valve	1
6	0531737	Cavity Plug	1
7	0531818	Directional Control Valve 4W3P Tandem	1
8	0531819	Solenoid Coil 115V Ac	2
9	0531820	SAE-04 Hex Plug	1

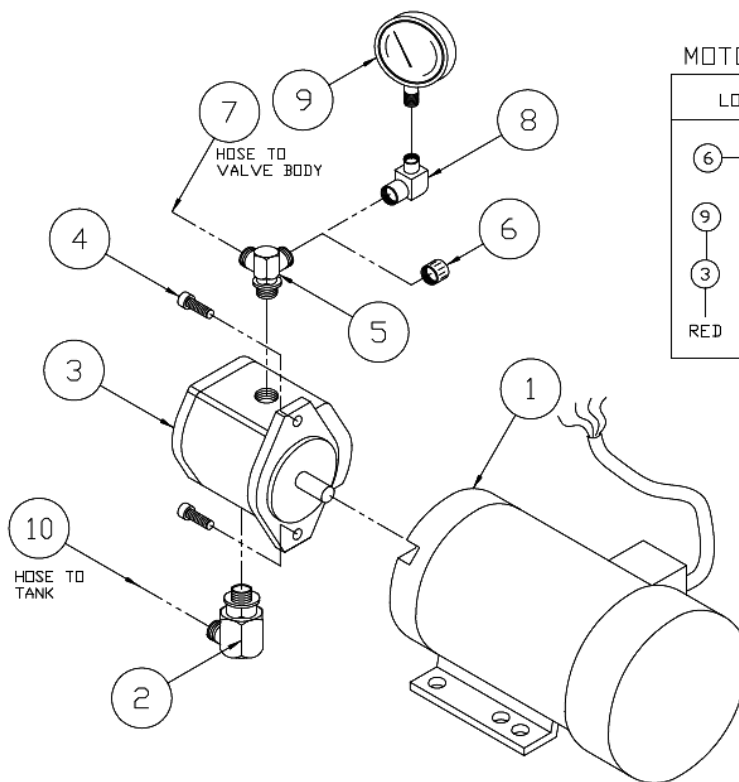


HYDRAULIC
SCHEMATIC

P2 MOTOR ASSEMBLY

PART NUMBER 02216003

Figure And Index No.	Part Number	Description	Qty.
1	05216613	3 HP Motor 220/440V (Hollow Shaft)	1
- or -	05216615	3HP Motor 575V (Hollow Shaft)	1
- or -	05216616	3 HP Motor Single Phase (Hollow Shaft)	1
2	0531531	6801-12 Hydraulic Fitting	1
3	05715701-2	Hydraulic Pump	1
4	0531050	3/8" x 1" SHCS	2
5	0531508	6801-10-12LP JM6 Hydraulic Fitting	1
6	0541531	304-C-6 Hydraulic Fitting	1
7	0571532	32" Hose To Valve Body	1
8	0531514	6503-6-4 Hydraulic Fitting	1
9	0541542	Pressure Gauge PGD-25-5000S	1
10	0531544	48" Hose To Tank	1

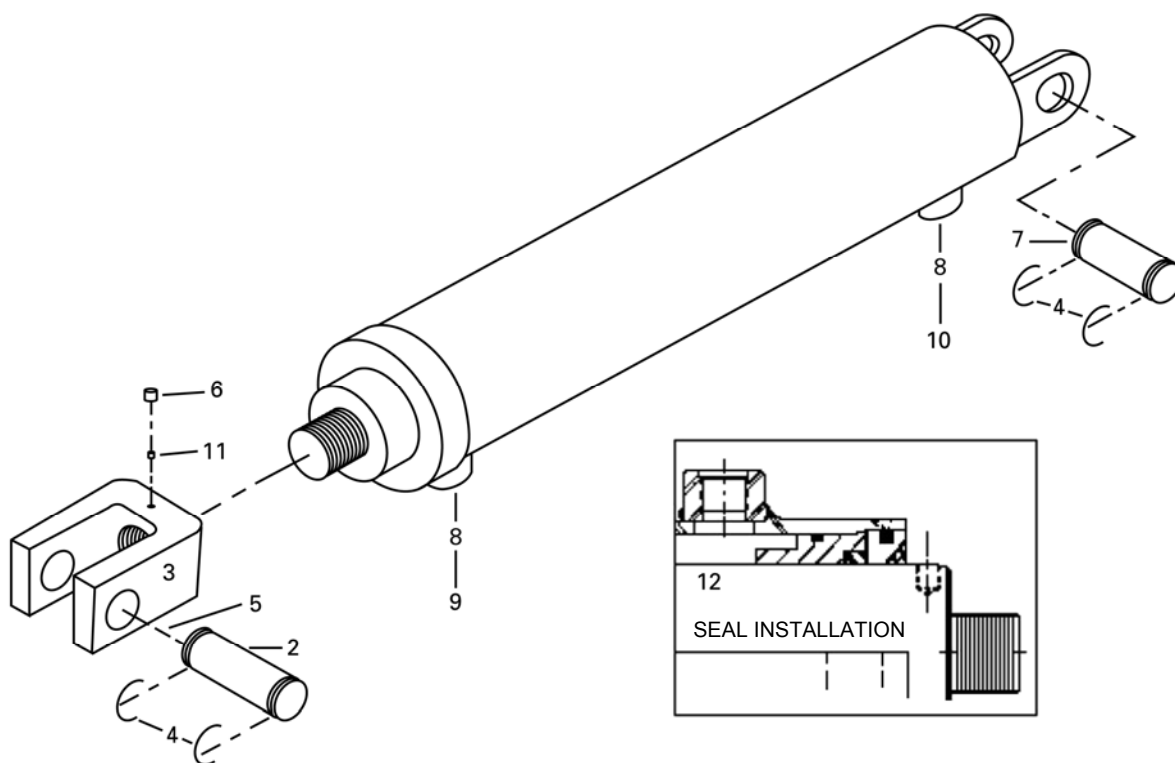


MOTOR WIRING

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

P2 CYLINDER ASSEMBLY

Figure And Index No.	Part Number	Description	Qty.
1	0521505-1	Cylinder	1
2	0230171	Clevis Pin	1
3	02201521	Clevis	1
4	0531340	5103-125 Snap Ring	4
5	0531362	Straight Zerk	1
6	0531085	1/2" x 1/2" SSS	1
7	0220172	Cylinder Pin	1
8	0521572	6802-10-8 Hydraulic Fitting	2
9	0531521	50" Hose To Valve Body	1
10	0531522	75" Hose To Valve Body	1
11	N/A	Nylock Plug	1

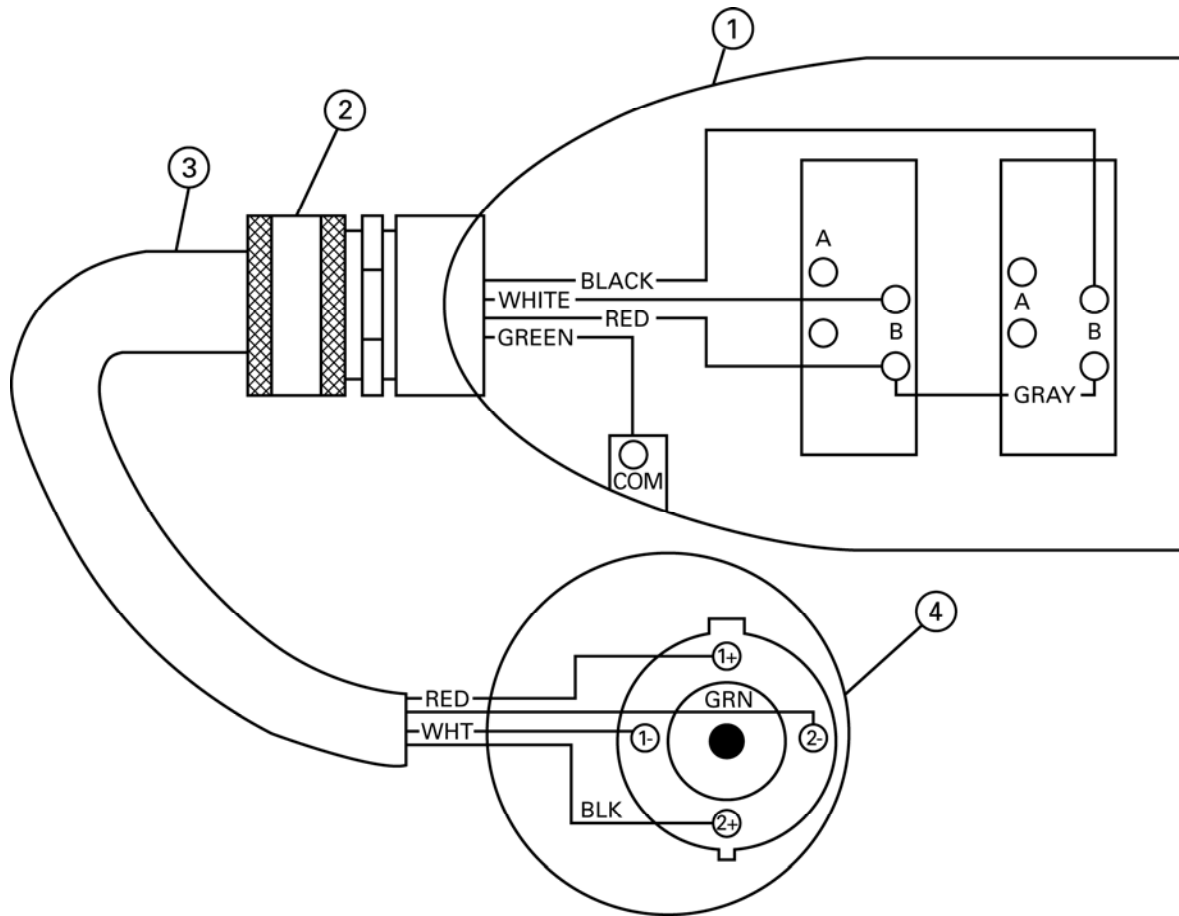


FOOT SWITCH ASSEMBLY

PART NUMBER 0231628CH

Figure And Index No.	Part Number	Description	Qty.
1	0531655	Foot Switch	1
2	0531636	Cord Grip	1
3	0531637	16 - 4 SEO Cord (sold by the foot)	6 ft
4	0531617	4 Pole Plug	1

NOTE: Limit Switches in Foot Pedal are not a stock item.



P2 KNIVES

Index No.	Part Number	Description	Qty.
	0220250	Flat Shear Knives x 10"	2
	0220251	Flat Shear Knives x 13"	2
	0220252	1/4" Round Bar Knife	2
	0220253	3/8" Round Bar Knife	2
	0220254	1/2" Round Bar Knife	2
	0220255	5/8" Round Bar Knife	2
	0220256	3/4" Round Bar Knife	2
	0220257	7/8" Round Bar Knife	2
	0220258	1" Round Bar Knife	2
	0220259	1-1/8" Round Bar Knife	2
	0220260	1-1/4" Round Bar Knife	2
	0220261	1-3/8" Round Bar Knife	2
	0220262	1/2" Square Bar Knife	2
	0220263	5/8" Square Bar Knife	2
	0220264	3/4" Square Bar Knife	2
	0220265	7/8" Square Bar Knife	2
	0220266	1" Square Bar Knife	2
	0220270	Round Bar Knife Blank	2
	0220274	Lower Angle Knife-	2
	0220275	Upper Angle Knife	1
	0220276	Lower Coper End Knife	1
	0220277	Upper Coper Knife	1
	0220278	Lower Coper Side Knife	2
	0531050	3/8" x 1" SHCS - Upper Coper	4
	0531069	7/16" x 1-1/2" SHCS - Lower Coper Side	2
	0531069	7/16" x 1-1/2" SHCS - Upper Shear	4
	0531069	7/16" x 1-1/2" SHCS - Upper Round Bar	2
	0531071	7/16" x 2" SHCS - Lower Coper End	2
	0531071	7/16" x 2" SHCS - Lower Shear	4
	0531071	7/16" x 2" SHCS - Lower Round Bar	2
	0531071	7/16" x 2" SHCS - Lower Angle	4
	0531330	Woodruff Key - Upper Coper Knife	1

Piranha Optional Tooling and Attachments

Additional Options Shown on Inside of Front Cover

Enhance your Piranha's versatility!

Pressbrake Tooling Holders

- Allows you to use pressbrake punches and dies in your ironworker for higher precision bending. **Not available on the P2 model.**



Roller Feed Tables

- Available in 5' lengths.
- Includes rollers for angle and flat bar sections.
- 20" wide flat rollers and 6" angles.



Channel Shear

- Attaches to the punch end of the machine.
 - Removes a 1/2" slug for each cut.
 - Slug must be slid out the front of the channel shear after each cut.
 - A pinned slide block is adjusted to accommodate different widths of channel.
- Not available on the P2 model.**



Channel Die Block

- Enables you to punch into the legs of channel and other structural shapes.
- Mounts in place of your standard die block.
- Still utilizes your urethane punch attachment.
- Can be used in conjunction with offset dies to punch very near to the web of your material.

