



OPERATOR'S MANUAL

Metal Working



200/20 TON HYDRAULIC SHOP PRESS MODEL: HSP-200M-C

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THANK YOU & WARRANTY

Thank you for your purchase of a machine from Baileigh Industrial. We hope that you find it productive and useful to you for a long time to come.

Inspection & Acceptance. Buyer shall inspect all Goods within ten (10) days after receipt thereof. Buyer's payment shall constitute final acceptance of the Goods and shall act as a waiver of the Buyer's rights to inspect or reject the goods unless otherwise agreed. If Buyer rejects any merchandise, Buyer must first obtain a Returned Goods Authorization ("RGA") number before returning any goods to Seller. Goods returned without a RGA will be refused. Seller will not be responsible for any freight costs, damages to goods, or any other costs or liabilities pertaining to goods returned without a RGA. Seller shall have the right to substitute a conforming tender. Buyer will be responsible for all freight costs to and from Buyer and repackaging costs, if any, if Buyer refuses to accept shipment. If Goods are returned in unsalable condition, Buyer shall be responsible for full value of the Goods. Buyer may not return any special-order Goods. Any Goods returned hereunder shall be subject to a restocking fee equal to 30% of the invoice price.

Specifications. Seller may, at its option, make changes in the designs, specifications or components of the Goods to improve the safety of such Goods, or if in Seller's judgment, such changes will be beneficial to their operation or use. Buyer may not make any changes in the specifications for the Goods unless Seller approves of such changes in writing, in which event Seller may impose additional charges to implement such changes.

Limited Warranty. Seller warrants to the original end-user that the Goods manufactured or provided by Seller under this Agreement shall be free of defects in material or workmanship for a period of twelve (12) months from the date of purchase, provided that the Goods are installed, used, and maintained in accordance with any instruction manual or technical guidelines provided by the Seller or supplied with the Goods, if applicable. The original end-user must give written notice to Seller of any suspected defect in the Goods prior to the expiration of the warranty period. The original end-user must also obtain a RGA from Seller prior to returning any Goods to Seller for warranty service under this paragraph. Seller will not accept any responsibility for Goods returned without a RGA. The original end-user shall be responsible for all costs and expenses associated with returning the Goods to Seller for warranty service. In the event of a defect, Seller, at its sole option, shall repair or replace the defective Goods or refund to the original end-user the purchase price for such defective Goods. Goods are not eligible for replacement or return after a period of 30 days from date of receipt. The foregoing warranty is Seller's sole obligation, and the original end-user's exclusive remedy, with regard to any defective Goods. This limited warranty does not apply to: (a) die sets, tooling, and saw blades; (b) periodic or routine maintenance and setup, (c) repair or replacement of the Goods due to normal wear and tear, (d) defects or damage to the Goods resulting from misuse, abuse, neglect, or accidents, (e) defects or damage to the Goods resulting from improper or unauthorized alterations, modifications, or changes; and (f) any Goods that has not been installed and/or maintained in accordance with the instruction manual or technical guidelines provided by Seller.

EXCLUSION OF OTHER WARRANTIES. THE FOREGOING LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED. ANY AND ALL OTHER EXPRESS, STATUTORY OR IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE ARE EXPRESSLY DISCLAIMED. NO WARRANTY IS MADE WHICH EXTENDS BEYOND THAT WHICH IS EXPRESSLY CONTAINED HEREIN.

Limitation of Liability. IN NO EVENT SHALL SELLER BE LIABLE TO BUYER OR ANY OTHER PARTY FOR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES (INCLUDING, WITHOUT LIMITATION, LOST PROFITS OR DOWN TIME) ARISING FROM OR IN MANNER CONNECTED WITH THE GOODS, ANY BREACH BY SELLER OR ITS AGENTS OF THIS AGREEMENT, OR ANY OTHER CAUSE WHATSOEVER, WHETHER BASED ON CONTRACT, TORT OR ANY OTHER THEORY OF LIABILITY. BUYER'S REMEDY WITH RESPECT TO ANY CLAIM ARISING UNDER THIS AGREEMENT IS STRICTLY LIMITED TO NO MORE THAN THE AMOUNT PAID BY THE BUYER FOR THE GOODS.



Force Majeure. Seller shall not be responsible for any delay in the delivery of, or failure to deliver, Goods due to causes beyond Seller's reasonable control including, without limitation, acts of God, acts of war or terrorism, enemy actions, hostilities, strikes, labor difficulties, embargoes, non-delivery or late delivery of materials, parts and equipment or transportation delays not caused by the fault of Seller, delays caused by civil authorities, governmental regulations or orders, fire, lightening, natural disasters or any other cause beyond Seller's reasonable control. In the event of any such delay, performance will be postponed by such length of time as may be reasonably necessary to compensate for the delay.

Installation. If Buyer purchases any Goods that require installation, Buyer shall, at its expense, make all arrangements and connections necessary to install and operate the Goods. Buyer shall install the Goods in accordance with any Seller instructions and shall indemnify Seller against any and all damages, demands, suits, causes of action, claims and expenses (including actual attorneys' fees and costs) arising directly or indirectly out of Buyer's failure to properly install the Goods.

Work By Others; Safety Devices. Unless agreed to in writing by Seller, Seller has no responsibility for labor or work performed by Buyer or others, of any nature, relating to design, manufacture, fabrication, use, installation or provision of Goods. Buyer is solely responsible for furnishing, and requiring its employees and customers to use all safety devices, guards and safe operating procedures required by law and/or as set forth in manuals and instruction sheets furnished by Seller. Buyer is responsible for consulting all operator's manuals, ANSI or comparable safety standards, OSHA regulations and other sources of safety standards and regulations applicable to the use and operation of the Goods.

Remedies. Each of the rights and remedies of Seller under this Agreement is cumulative and in addition to any other or further remedies provided under this Agreement or at law or equity.

Attorney's Fees. In the event legal action is necessary to recover monies due from Buyer or to enforce any provision of this Agreement, Buyer shall be liable to Seller for all costs and expenses associated therewith, including Seller's actual attorneys' fees and costs.

Governing Law/Venue. This Agreement shall be construed and governed under the laws of the State of Wisconsin, without application of conflict of law principles. Each party agrees that all actions or proceedings arising out of or in connection with this Agreement shall be commenced, tried, and litigated only in the state courts sitting in Manitowoc County, Wisconsin or the U.S. Federal Court for the Eastern District of Wisconsin. Each party waives any right it may have to assert the doctrine of "forum non conveniens" or to object to venue to the extent that any proceeding is brought in accordance with this section. Each party consents to and waives any objection to the exercise of personal jurisdiction over it by courts described in this section. Each party waives to the fullest extent permitted by applicable law the right to a trial by jury.

Summary of Return Policy.

- 10 Day acceptance period from date of delivery. Damage claims and order discrepancies will not be accepted after this time.
- You must obtain a Baileigh issued RGA number PRIOR to returning any materials.
- Returned materials must be received at Baileigh in new condition and in original packaging.
- Altered items are not eligible for return.
- Buyer is responsible for all shipping charges.
- A 30% re-stocking fee applies to all returns.

Baileigh Industrial makes every effort to ensure that our posted specifications, images, pricing and product availability are as correct and timely as possible. We apologize for any discrepancies that may occur. Baileigh Industrial reserves the right to make any and all changes deemed necessary in the course of business including but not limited to pricing, product specifications, quantities, and product availability.

For Customer Service & Technical Support:

Please contact one of our knowledgeable Sales and Service team members at:
(920) 684-4990 or e-mail us at sales@baileigh.com



INTRODUCTION

The quality and reliability of the components assembled on a Baileigh Industrial machine guarantee near perfect functioning, free from problems, even under the most demanding working conditions. However if a situation arises, refer to the manual first. If a solution cannot be found, contact the distributor where you purchased our product. Make sure you have the serial number and production year of the machine (stamped on the nameplate). For replacement parts refer to the assembly numbers on the parts list drawings.

Our technical staff will do their best to help you get your machine back in working order.

In this manual you will find: (when applicable)

- Safety procedures
- Correct installation guidelines
- Description of the functional parts of the machine
- Capacity charts
- Set-up and start-up instructions
- Machine operation
- Scheduled maintenance
- Parts lists

GENERAL NOTES

After receiving your equipment remove the protective container. Do a complete visual inspection, and if damage is noted, **photograph it for insurance claims** and contact your carrier at once, requesting inspection. Also contact Baileigh Industrial and inform them of the unexpected occurrence. Temporarily suspend installation.

Take necessary precautions while loading / unloading or moving the machine to avoid any injuries.

Your machine is designed and manufactured to work smoothly and efficiently. Following proper maintenance instructions will help ensure this. Try and use original spare parts, whenever possible, and most importantly; **DO NOT** overload the machine or make any modifications.



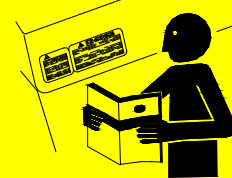
Note: *This symbol refers to useful information throughout the manual.*



IMPORTANT

PLEASE READ THIS OPERATORS MANUAL CAREFULLY

It contains important safety information, instructions, and necessary operating procedures. The continual observance of these procedures will help increase your production and extend the life of the equipment.



SAFETY INSTRUCTIONS

LEARN TO RECOGNIZE SAFETY INFORMATION

This is the safety alert symbol. When you see this symbol on your machine or in this manual, **BE ALERT TO THE POTENTIAL FOR PERSONAL INJURY!**

Follow recommended precautions and safe operating practices.

UNDERSTAND SIGNAL WORDS

A signal word – **DANGER**, **WARNING**, or **CAUTION** is used with the safety alert symbol. **DANGER** identifies a hazard or unsafe practice that will result in severe **Injury or Death**.

Safety signs with signal word **DANGER** or **WARNING** are typically near specific hazards.

General precautions are listed on **CAUTION** safety signs. **CAUTION** also calls attention to safety messages in this manual.



DANGER



WARNING



CAUTION

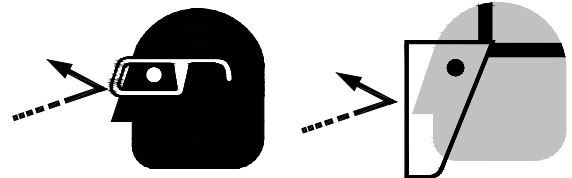


SAVE THESE INSTRUCTIONS.
Refer to them often and use them to instruct others.



PROTECT EYES

Wear safety glasses or suitable eye protection when working on or around machinery.



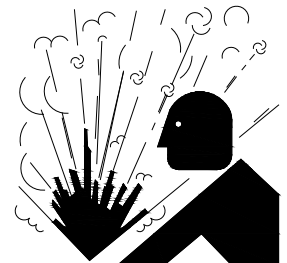
PROTECT AGAINST NOISE

Prolonged exposure to loud noise can cause impairment or loss of hearing. Wear suitable hearing protective devices such as ear muffs or earplugs to protect against objectionable or uncomfortable loud noises.



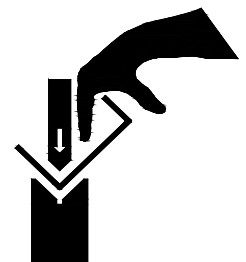
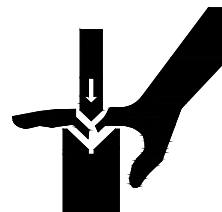
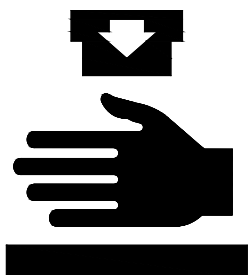
HYDRAULIC HOSE FAILURE

Exercise **CAUTION** around hydraulic hoses in case of a hose or fitting failure.



BEWARE OF CRUSH HAZARD

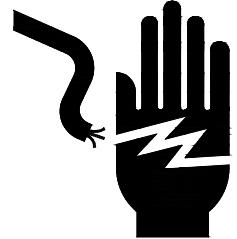
NEVER place your hands, fingers, or any part of your body in the die area of this machine. Keep hands and fingers away from the ram and tooling when the machine is in operation.





HIGH VOLTAGE

USE CAUTION IN HIGH VOLTAGE AREAS. DO NOT assume the power to be off.
FOLLOW PROPER LOCKOUT PROCEDURES.



EMERGENCY STOP BUTTON

In the event of incorrect operation or dangerous conditions, the machine can be stopped immediately by pressing the **E-STOP** button. Twist the emergency stop button clockwise (cw) to reset. Note: Resetting the E-Stop will not start the machine.



Read Manual



Mandatory Pressure



Disconnect Power when changing tooling or during service



Crush Hazard



Do NOT Remove Guard



SAFETY PRECAUTIONS



Metal working can be dangerous if safe and proper operating procedures are not followed. As with all machinery, there are certain hazards involved with the operation of the product. Using the machine with respect and caution will considerably lessen the possibility of personal injury. However, if normal safety precautions are overlooked or ignored, personal injury to the operator may result.

Safety equipment such as guards, hold-downs, safety glasses, dust masks and hearing protection can reduce your potential for injury. But even the best guard won't make up for poor judgment, carelessness or inattention. **Always use common sense** and exercise **caution** in the workshop. If a procedure feels dangerous, don't try it.

REMEMBER: Your personal safety is your responsibility.



WARNING: FAILURE TO FOLLOW THESE RULES MAY RESULT IN SERIOUS PERSONAL INJURY

Dear Valued Customer:

- All Baileigh machines should be used only for their intended use.
- Baileigh does not recommend or endorse making any modifications or alterations to a Baileigh machine. Modifications or alterations to a machine may pose a substantial risk of injury to the operator or others and may do substantial damage to the machine.
- Any modifications or alterations to a Baileigh machine will invalidate the machine's warranty.

PLEASE ENJOY YOUR BAILEIGH MACHINE!PLEASE ENJOY IT SAFELY!

1. **FOR YOUR OWN SAFETY, READ INSTRUCTION MANUAL BEFORE OPERATING THE MACHINE.** Learn the machine's application and limitations as well as the specific hazards.
2. **Only trained and qualified personnel can operate this machine.**
3. **Make sure guards are in place and in proper working order before operating machinery.**
4. **Remove any adjusting tools.** Before operating the machine, make sure any adjusting tools have been removed.
5. **Keep work area clean.** Cluttered areas invite injuries.
6. **Overloading machine.** By overloading the machine, you may cause injury from flying parts. **DO NOT** exceed the specified machine capacities.



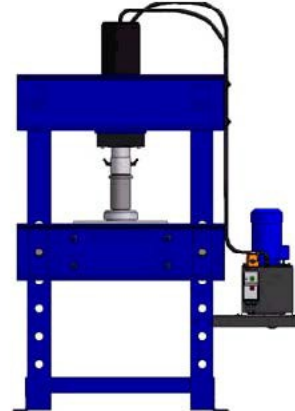
7. **Dressing material edges.** Always chamfer and deburr all sharp edges.
8. **Do not force tool.** Your machine will do a better and safer job if used as intended. **DO NOT** use inappropriate attachments in an attempt to exceed the machines rated capacity.
9. **Use the right tool for the job. DO NOT** attempt to force a small tool or attachment to do the work of a large industrial tool. **DO NOT** use a tool for a purpose for which it was not intended.
10. **Dress appropriate. DO NOT** wear loose fitting clothing or jewelry as they can be caught in moving machine parts. Protective clothing and steel toe shoes are recommended when using machinery. Wear a restrictive hair covering to contain long hair.
11. **Use eye and ear protection.** Always wear ISO approved impact safety goggles. Wear a full-face shield if you are producing metal filings.
12. **Do not overreach.** Maintain proper footing and balance at all times. **DO NOT** reach over or across a running machine.
13. **Stay alert.** Watch what you are doing and use common sense. **DO NOT** operate any tool or machine when you are tired.
14. **Check for damaged parts.** Before using any tool or machine, carefully check any part that appears damaged. Check for alignment and binding of moving parts that may affect proper machine operation.
15. **Observe work area conditions. DO NOT** use machines or power tools in damp or wet locations. Do not expose to rain. Keep work area well lighted. **DO NOT** use electrically powered tools in the presence of flammable gases or liquids.
16. **Keep children away.** Children must never be allowed in the work area. **DO NOT** let them handle machines, tools, or extension cords.
17. **Store idle equipment.** When not in use, tools must be stored in a dry location to inhibit rust. Always lock up tools and keep them out of reach of children.
18. **DO NOT operate machine if under the influence of alcohol or drugs.** Read warning labels on prescriptions. If there is any doubt, **DO NOT** operate the machine.
19. **DO NOT** touch live electrical components or parts.
20. **Turn off** power before checking, cleaning, or replacing any parts.
21. Be sure **all** equipment is properly installed and grounded according to national, state, and local codes.
22. Inspect power and control cables periodically. Replace if damaged or bare wires are exposed. **Bare wiring can kill!**
23. **DO NOT** bypass or defeat any safety interlock systems.
24. Keep visitors a safe distance from the work area.



IMPORTANT: Maximum pressing force can be exerted for a short time only. Do not use maximum force when the ram is extended further than 3/4 of its length. This can damage the piston rod.



Maximum force with long stroke



Maximum force with short stroke



Note: Not observing the maximum working period can result in overheating the hydraulic oil and heating up the hydraulic unit. The machine can get damaged and the operator may suffer burns.

TECHNICAL SUPPORT

Our technical support department can be reached at 920.684.4990 and asking for the support desk for purchased machines. Tech Support handles questions on machine setup, schematics, warranty issues, and individual parts needs: (other than die sets and blades).

For specific application needs or future machine purchases contact the Sales Department at: sales@baileigh.com, Phone: 920.684.4990, or Fax: 920.684.3944.



Note: The photos and illustrations used in this manual are representative only and may not depict the actual color, labeling or accessories and may be intended to illustrate technique only.



Note: The specifications and dimensions presented here are subject to change without prior notice due to improvements of our products.



TECHNICAL SPECIFICATIONS

Main Bed, Maximum Capacity	200 ton (181.4 ton)
Main Working Speed - Ram Extension	.15" / sec. (3.9mm/sec.)
Main Return Speed - Ram Retraction	.22" / sec. (5.8mm/sec.)
Main Cylinder Stroke	13.75" (350mm)
Table Dimensions (L x D)	47" x 21" (1194 x 533mm)
Main Cylinder Diameter	11" (280mm)
Main Piston Rod Diameter	6.125" (155mm)
Main Piston Head Diameter	6.125" (155mm)
Main Cylinder Movable	Yes
Main Ram to Side Frame	11.5" (292mm)
Main Ram to Table Top Distances	10" (254mm), 22" (560mm), 34" (864mm)
Main Table Inside Clearance	18.675" (475mm) Top, 7.1" (180mm) Bottom
Side Bed, Maximum Capacity	20 ton (18.1 ton)
Side Working Speed - Ram Extension	.75" / sec. (20mm/sec.)
Side Return Speed - Ram Retraction	1" / sec. (25.4mm/sec.)
Side Cylinder Stroke	11.75" (299mm)
Side Table	16.5" x 19" (419 x 482mm)
Side Cylinder Diameter	3.95" (100mm)
Side Piston Rod Diameter	1.97" (50mm)
Side Piston Head Diameter	1.77" (45mm)
Side Ram to Table Top Distances	7.5" (190mm), 16.75" (425mm), 26" (660mm), 35.25" (895mm)
Maximum Pressure	4250 psi (30mPa)
Maximum Pressure – Side Ram*	1300 psi (9mPa) <i>*Operator Responsible</i>
Pump Speed	3.96gal/min. (15L/min.)
Oil Capacity	32gal (121L)
Oil Type	HL46
Power	220V, 3ph, 60hz
Motor	10hp (7.5kw) 220V / 3ph / 60hz / 27A
Overall Dimension (W x D x H)	88.6" x 43.5" x 87" (2250 x 1105 x 2210mm)
Floor Mounting Holes	36.9375" x 71.54" (938 x 1815mm)
Shipping Weight	Frame 6570lbs. (2980kg) Pump 385lbs. (175kg)
Shipping Dimensions	Frame 96" x 48" x 94" (2438 x 1219 x 2388mm) Pump 48" x 31" x 54" (1219 x 787 x 1372mm)



UNPACKING AND CHECKING CONTENTS

Your Baileigh machine is shipped complete. Separate all parts from the packing material and check each item carefully. Make certain all items are accounted for before discarding any packing material.



WARNING: SUFFOCATION HAZARD! Immediately discard any plastic bags and packing materials to eliminate choking and suffocation hazards to children and animals.

If any parts are missing, **DO NOT** place the machine into service until the missing parts are obtained and installed correctly.

Cleaning



WARNING: DO NOT USE gasoline or other petroleum products to clean the machine. They have low flash points and can explode or cause fire.



CAUTION: When using cleaning solvents work in a well-ventilated area. Many cleaning solvents are toxic if inhaled.

Your machine may be shipped with a rustproof waxy coating and/or grease on the exposed unpainted metal surfaces. Fully and completely remove this protective coating using a degreaser or solvent cleaner. Moving items will need to be moved along their travel path to allow for cleaning the entire surface. For a more thorough cleaning, some parts will occasionally have to be removed. **DO NOT USE** acetone or brake cleaner as they may damage painted surfaces.

Follow manufacturer's label instructions when using any type of cleaning product. After cleaning, wipe unpainted metal surfaces with a light coating of quality oil or grease for protection.



Important: This waxy coating is **NOT** a lubricant and will cause the machine to stick and lose performance as the coating continues to dry.





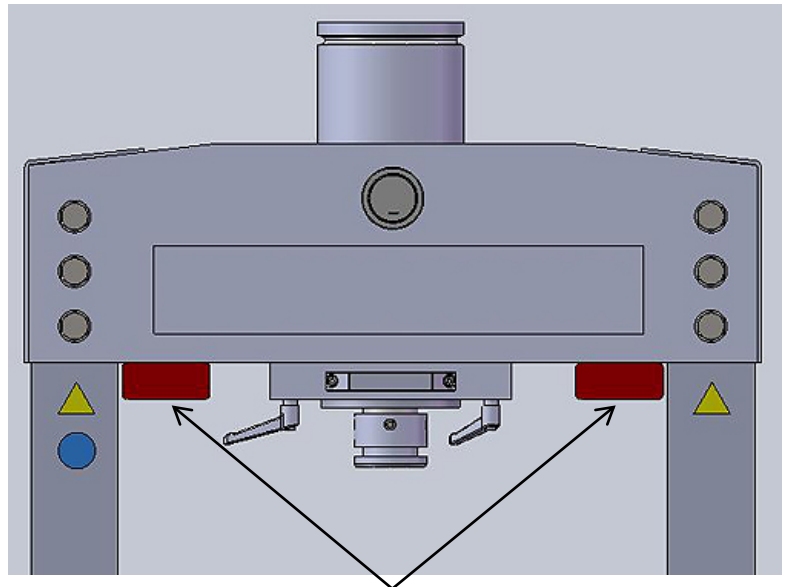
TRANSPORTING AND LIFTING



IMPORTANT: *Lifting and carrying operations should be carried out by skilled workers, such as a truck operator, crane operator, etc. If a crane is used to lift the machine, attach the lifting chain carefully, making sure the machine is well balanced.*

Follow these guidelines when lifting with truck or trolley:

- The lift truck must be able to lift at least 1.5 – 2 times the machines gross weight.
- Make sure the machine is balanced. While transporting, avoid rough or jerky motion, and maintain a safe clearance zone around the transport area.
- Use a fork lift with sufficient lifting capacity and forks that are long enough to reach the complete width of the machine.
- Remove the securing bolts that attach the machine to the pallet.
- Approaching the machine from the side, lift the machine on the frame taking care that there are no cables or pipes in the area of the forks.
- Move the machine to the required position and lower gently to the floor.
- Level the machine so that all the supporting feet are taking the weight of the machine and no rocking is taking place.



Lift with Forks Here

Follow these guidelines when lifting crane or hoist:

- Always lift and carry the machine with the lifting holes provided at the top of the machine.
- Use lift equipment such as straps, chains, capable of lifting 1.5 to 2 times the weight of the machine.
- Take proper precautions for handling and lifting.
- Check if the load is properly balanced by lifting it an inch or two.
- Lift the machine, avoiding sudden accelerations or quick changes of direction.
- Locate the machine where it is to be installed, and lower slowly until it touches the floor.



INSTALLATION

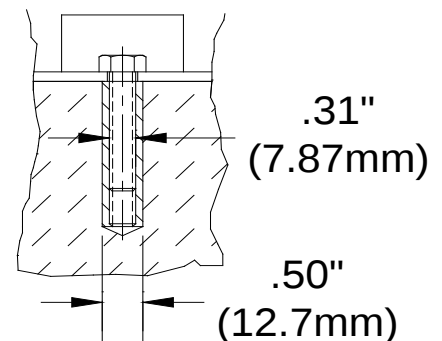
IMPORTANT:

Consider the following when looking for a suitable location to place the machine:

- Overall weight of the machine.
- Weight of material being processed.
- Sizes of material to be processed through the machine.
- Space needed for auxiliary stands, work tables, or other machinery.
- Clearance from walls and other obstacles.
- Maintain an adequate working area around the machine for safety.
- Have the work area well illuminated with proper lighting.
- Keep the floor free of oil and make sure it is not slippery.
- Remove scrap and waste materials regularly, and make sure the work area is free from obstructing objects.
- If long lengths of material are to be fed into the machine, make sure that they will not extend into any aisles.
- **LEVELING:** The machine should be sited on a level, concrete floor. Provisions for securing it should be in position prior to placing the machine. The accuracy of any machine depends on the precise placement of it to the mounting surface.
- **FLOOR:** This tool distributes a large amount of weight over a small area. Make certain that the floor is capable of supporting the weight of the machine, work stock, and the operator. The floor should also be a level surface. If the unit wobbles or rocks once in place, be sure to eliminate by using shims.
- **WORKING CLEARANCES:** Take into consideration the size of the material to be processed. Make sure that you allow enough space for you to operate the machine freely.
- **POWER SUPPLY PLACEMENT:** The power supply should be located close enough to the machine so that the power cord is not in an area where it would cause a tripping hazard. Be sure to observe all electrical codes if installing new circuits and/or outlets.

Anchoring the Machine

- Once positioned, anchor the machine to the floor, as shown in the diagram, using bolts and expansion plugs or sunken tie rods that connect through holes in the base of the stand.





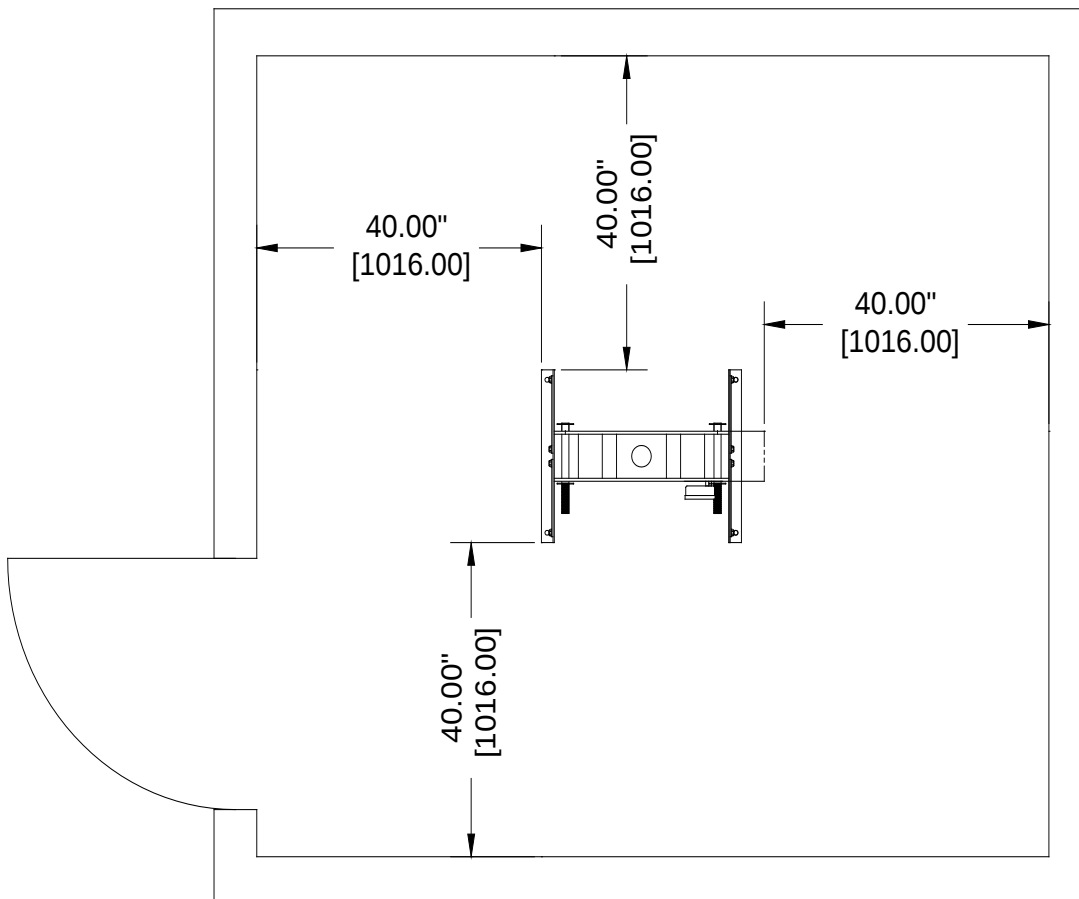
⚠ WARNING: Before operating the press, make sure it is firmly anchored to the floor. If it tips over on you, it could cause severe injury or death.

Deliver condition

The press is delivered in the following condition:

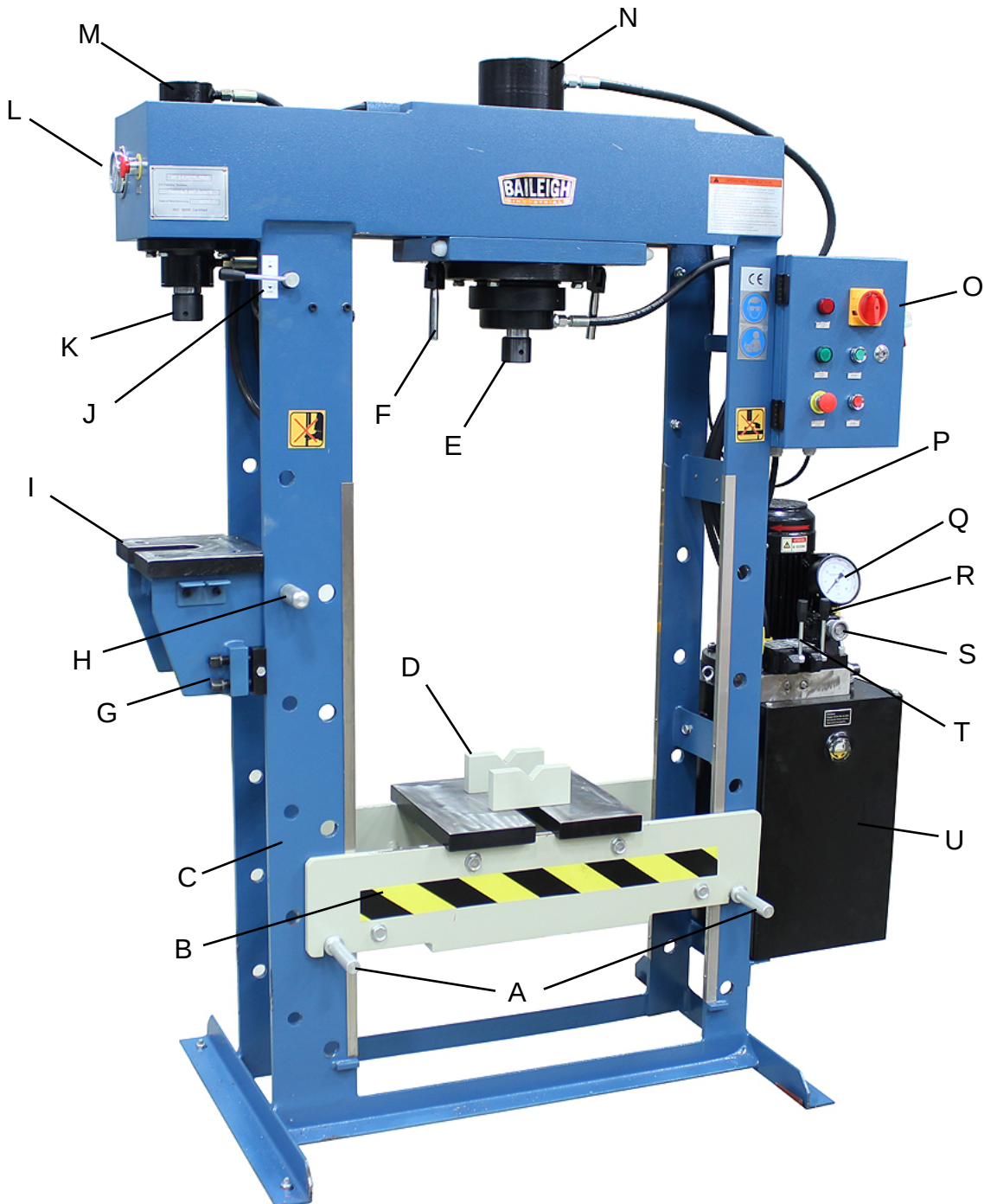
- Table in lowest position
- Hydro-unit on inside of frame
- Lifting chain packed in separate box
- Cylinder fixed in the middle of the press
- Hydraulic unit without oil

Provide adequate clearance for the equipment in an environment that is clean, non-flammable, non-corrosive, and dust free.





GETTING TO KNOW YOUR MACHINE



Note: The photos and illustrations used in this manual are representative only and may not depict the actual color, labeling or accessories and may be intended to illustrate technique only.



Item	Description
A	Main Table Support Pins; Supports the work table at the desired work height.
B	Main Work Table; Moveable table to raise or lower to support the material to be pressed.
C	Main Frame; Supports the entire machine components and work material.
D	Heal Blocks and V-Blocks; used to support the material during the pressing operation.
E	Main Cylinder Head; Removable head which presses against the work material.
F	Main Cylinder Release Handles; release the handles to side the main cylinder side to side.
G	Squaring Adjustment; squares the side table to the frame. (Loosen slide block first.)
H	Side Table Support Pin; Supports the side work table at the desired work height.
I	Side Work Table; Moveable table to raise or lower to support the material to be pressed.
J	Side Cylinder Operating Lever; Push or pull to raise or lower the ram.
K	Side Cylinder Head; Removable head which presses against the work material.
L	Side Station Operating Controls; E-Stop to stop the hydraulic system if needed and a pressure gauge to monitor the pressure of the side cylinder.
M	Side Press Cylinder; Provides the force to complete the press operation.
N	Main Press Cylinder; Provides the force to complete the press operation.
O	Electrical Control Cabinet; houses all of the electrical controls to operate the press.
P	Hydraulic Pump Motor; Runs the hydraulic pump to create the oil flow and pressure used during operation.
Q	Main Pressure Gauge; displays the current pressure during operation.
R	Station Selection Valve; Selects and directs the oil flow to either the main cylinder of the side cylinder.
S	Pressure Relief Valve; Adjust as need for the material to be pressed. NEVER EXCEED THE MAXIMUM PRESSURE LISTED IN THE SPECIFICATIONS.
T	Main Cylinder Operating Lever; Push or pull to raise or lower the ram.
U	Hydraulic Tank; Hold the hydraulic oil and support the hydraulic controls. The tank hydraulic system is free-standing and not attached to the frame for this model.
	Back Safety Guard; Prevents inadvertent access from the back of the machine.
	Work Table Lift Chain; Used to lift and lower the work tables using the cylinder to provide the lifting and lowering force.



ASSEMBLY AND SET UP



WARNING: For your own safety, **DO NOT** connect the machine to the power source until the machine is completely assembled and you read and understand the entire instruction manual.

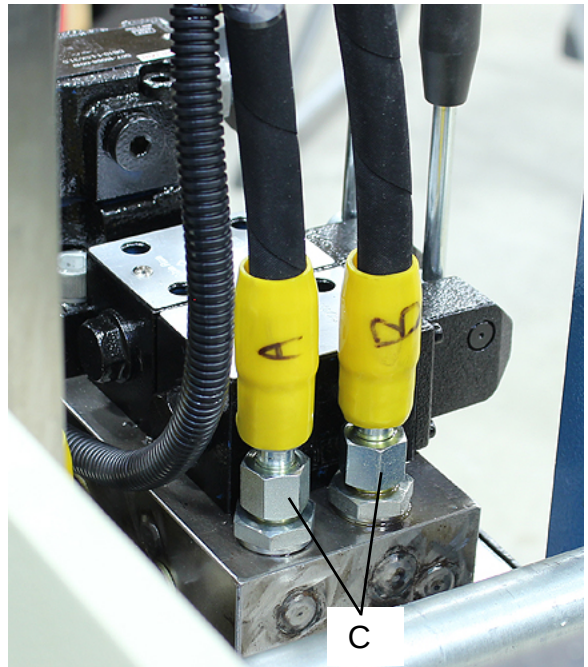


Note: The hydraulic unit weights about 200lbs (95kg). For placing the unit in the correct position, use and assistant or safe lifting equipment to lift the unit.

The hydraulic unit is shipped separately and is free standing. It will be positioned on the right side of the press frame.

To place the unit in working position:

1. Position the press in its desired location.
2. Place the hydraulic assembly on the right side of the press so that the hydraulic hoses easily reach the hydraulic unit.
3. Route the main cylinder hydraulic hoses (C) to the hydraulic fitting and matching the letter labels (A to A and B to B), one at a time, remove the plastic caps and install the hoses to the fittings. Tighten securely, however do not over tighten and distort the swivel fitting collar.
4. Route the side cylinder hydraulic hoses (D) to the hydraulic fitting and matching the letter labels (C to C and D to D), one at a time, remove the plastic caps and install the hoses to the fittings. Tighten securely, however do not over tighten and distort the swivel fitting collar.
5. Fill the tank with hydraulic oil. The press is shipped without oil. Before starting up, the tank needs to be filled with hydraulic oil #68 SHELL BRAND or an equivalent with similar specifications.





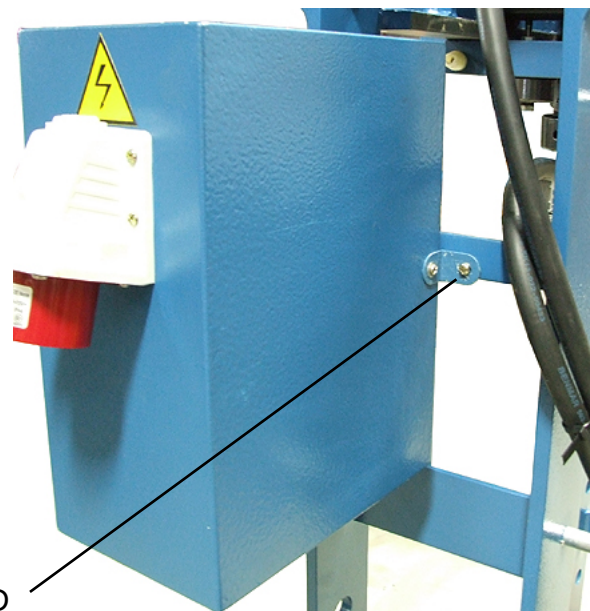
6. Remove the filler plug on top of the hydraulic tank.
7. Fill the tank with approximately 32gal. (121L) of hydraulic oil.
8. Replace the filler plug.



IMPORTANT: NEVER run the motor with a low oil level. This will damage the hydraulic unit.

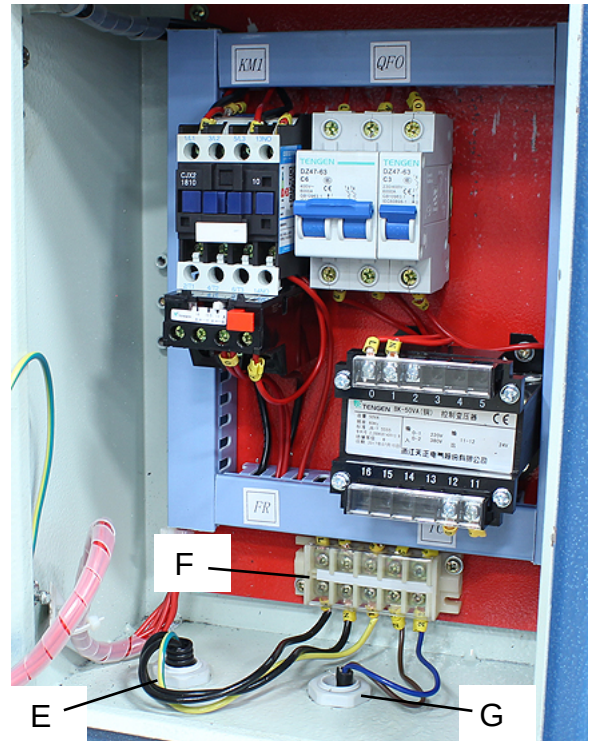


9. Remove the electrical cabinet from the packaging and using the three screws (E) installed in the right side of the frame, mount the cabinet to the frame and tighten securely.





10. Open the cabinet and route the wires from the motor into the bottom of the electrical cabinet and secure the strain relief (E) into the cabinet.
11. Connect the wires to the lower terminal strip (F) matching the labeling. U to U, V to V, W to W, and E to E.
12. Route the wires from the side press emergency stop into the bottom of the electrical cabinet and secure the strain relief (G) into the cabinet.
13. Connect the wires to the lower terminal strip (F) matching the labeling. 22 to 22 and 22 to 22.
14. Close the electrical cabinet.
15. Complete the electrical connections and then test the operation of the press and purge the air from the hydraulic system.
16. Install the back guard onto the standoffs and secure in position.





ELECTRICAL



WARNING: Baileigh Industrial is not responsible for any damage caused by wiring up to an alternative 3-phase power source other than direct 3-phase. If you are using an alternate power source, consult a certified electrician or contact Baileigh Industrial prior to energizing the machine.



CAUTION: HAVE ELECTRICAL UTILITIES CONNECTED TO MACHINE BY A CERTIFIED ELECTRICIAN!
Check if the available power supply is the same as listed on the machine nameplate.



WARNING: Make sure the grounding wire (green) is properly connected to avoid electric shock. DO NOT switch the position of the green grounding wire if any electrical plug wires are switched during hookup.

Power Specifications

Your tool is wired for 220 volts, 60Hz alternating current. Before connecting the tool to the power source, make sure the machine is cut off from power source.

Before switching on the power, you must check the voltage and frequency of the power to see if they meet with the requirement, the allowed range for the voltage is $\pm 5\%$, and for the frequency is $\pm 1\%$.

Considerations

- Observe local electrical codes when connecting the machine.
- The circuit should be protected with a time delay fuse or circuit breaker with a amperage rating slightly higher than the full load current of machine.
- A separate electrical circuit should be used for your tools. Before connecting the motor to the power line, make sure the switch is in the "OFF" position and be sure that the electric current is of the same characteristics as indicated on the tool.
- All line connections should make good contact. Running on low voltage will damage the motor.
- In the event of a malfunction or breakdown, grounding provides a path of least resistance for electric current to reduce the risk of electric shock. This tool is equipped with an electric cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into a matching outlet that is properly installed and grounded in accordance with all local codes and ordinances.



WARNING: In all cases, make certain the receptacle in question is properly grounded. If you are not sure, have a qualified electrician check the receptacle.

- Improper connection of the equipment-grounding conductor can result in risk of electric shock. The conductor with insulation having an outer surface that is green with or without yellow stripes is the equipment-grounding conductor. If repair or replacement of the electric cord or plug is necessary, do not connect the equipment-grounding conductor to a live terminal.
- Check with qualified electrician or service personnel if the grounding instructions are not completely understood, or if in doubt as to whether the tool is properly grounded.
- Repair or replace damaged or worn cord immediately.

Power cord connection:

1. Turn the main disconnect switch on the control panel to the OFF position.
2. Install the plug provided onto the appropriately sized power cord and route the cord away from the machine toward the power supply.
 - a. Route the power cord so that it will NOT become entangled in the machine in any way.
 - b. Route the cord to the power supply in a way that does NOT create a trip hazard.
3. Connect the power cord to the power supply and check that the power cord has not been damaged during installation.
4. When the machine is clear of any obstruction. The main power switch may be turned ON to test the operation.
5. Check that the motor is running in the correct direction.
6. If not, cut the power to the machine. Swap the position of any two of the three power wires; but DO NOT change the position of the green grounding wire!
7. Turn the switch OFF when the machine is not in operation.



OPERATION PREPLANNING

This is a general discussion on press operation and is not intended to be an exact step-by-step procedure. This is intended to create a broad thought process to be considered prior to using the press to stimulate the operator into thinking about as many possible scenarios that could cause injury or material damage. The operator should then take all steps they can think of to prevent or protect against such possible scenarios

The following is a listing of some of the most common procedures the operator shall take into consideration and employ. The specific application will require the operator to address any items not covered here.

- Provide a container or applicable padding under the press to protect the part when it drops.
- Positions the heel plates to support the workpiece and aligns the press pin or tooling on the part to be pressed.
- Preload the workpiece prior to proceeding with the full pressing operation.
- View the setup from various angles and verify that the ram remains aligned with and centered with the workpiece and the bed.
- Relieves the hydraulic pressure and allows the ram to return to the retracted position.



WARNING: Failure to center the piece part on the blocks and the ram to the piece part may cause serious injury.
Never compress springs or objects that when compressed, could shatter, or explode out of the press causing serious injury.

Workpiece Considerations

Before using this hydraulic press, you must inspect the workpiece. This is not a comprehensive list but rather a list of common issues. It is up to you to address any additional special items required to prepare your workpiece for press operations. Not addressing the items below can lead to galled, seized, or broken housings. Ignoring any of the items listed can lead to a workpiece or tooling being ejected from the press, which could cause severe injury or death.

- **Material Strength:** Make sure that the workpiece material is designed to withstand the intended force the press will apply.
- **Material Cleanliness:** Make sure that the workpiece is clean and that all burrs, grit, rust, or damage is removed from the pressing path. Light oiling on the components may prevent galling or seizing.
- **Pressing Path and Sequence:** Make sure that the direction of the component to be pressed on or off is correct and that the correct size of sleeve or arbor plate is used for support.

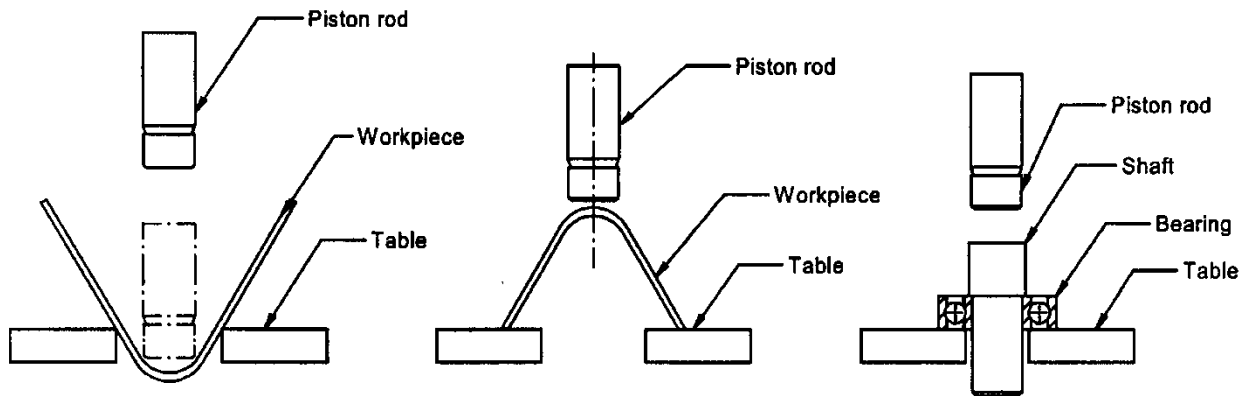


- **Fasteners and Retainers:** Make sure that all retaining rings, pins, or fasteners are removed, and no hidden secondary retainers are present.
- **Hidden Objects:** Some components house one or more pieces such as springs, retaining rings, or spacers. Make sure that the part to be dismantled with the press has the applicable caging system to catch hidden items. Should the workpiece slip or open up when the retaining ring is removed, and the hydraulic pressure is relieved.
- **Special Fits:** Make sure that interference fits are correct before pressing a part on, and make sure that the applicable parts have been heated or chilled to the correct temperatures to avoid galling and seizing. Be aware, that not all parts were designed to be pressed off. If in doubt, refer to the OEM of the part you are working on.

General Information

The Hydraulic Workshop Press is designed for:

- Bending and straightening of beams, profiles, pivots, shaft etc.
- (dis)assembly of bearings, bushings or pivots
- stamping, punching, forming of wide range of materials



Typical use of press

This machine can be used in repair shops, workshops, etc. To enable more options, the machine can be equipped with special tools as V-block or an inner table.



PRESS FUNCTIONS

Main Disconnect Switch

The main disconnect switch is located on the front of the electrical cabinet.

- Turn the switch to the ON position to supply power to the electrical controls. The red indicator will light up as long as the disconnect is ON.
- Turn the switch to the OFF position to remove power to the operation controls.

On and Off Switches

The on and off switches are positioned on the front of the electrical cabinet.

- Press and release the green button will start the motor of the hydraulic unit. There will be no movement of any parts after the motor runs. The green indicator will light up as long as the motor is running.
- Pushing the red button will stop the motor of the hydraulic unit. All parts will stay in the position they are at that moment.

Emergency Switch

The emergency switch is located on the front of the electrical cabinet and at the side press operators' station.

In the event of incorrect operation or dangerous conditions, the machine can be stopped immediately by pressing the **E-STOP** button. All other parts will stay in the position they are at the moment. Twist the emergency stop button clockwise (cw) to reset. Note: Resetting the E-Stop will not start the machine.

To restart the hydraulic unit again

- Make sure the incorrect or dangerous situation is solved.
- Reset the red button by turning it counter clockwise. The button cap will pop-up again.
- Actuate the hydraulic lever to the up and down position to relieve pressure from the hydraulic system.
- Push the green start button to start the hydraulic pump motor.





PRESSURE REGULATION VALVE

⚠ CAUTION: NEVER EXCEED THE MAXIMUM PRESSURE SETTING FOR THE RAM BEING USED!

The pressure regulation valve (A) is located in the top cover of the hydraulic unit. With this valve the maximum pressure, referring to the maximum press capacity, can be changed. Turning the knob clockwise will increase the pressure, turning the knob counter clockwise will decrease the pressure. Adjusting the pressure to meet the material can be very beneficial in completing the pressing operation while reducing the change to damage the piece part.

Working at reduced pressure when available will also reduce the stress on the press and the hydraulic system.

NOTICE: The Main Ram Maximum pressure is 4350psi (30mPa).
The Side Ram Maximum pressure is 1300psi (9mPa).
The operator **MUST** reduce the operating pressure when using the Side Ram.

Pressure Adjusting

Pressure for the Main Ram must be set using the Main Ram. Pressure for the Side Ram may be set using either ram.

1. Start the hydraulic unit.
2. Make sure the piston is in rest position (no force applied).
3. Set the table height in the top position.
4. Place the heal blocks on the table.
5. Loosen the lock nut behind the hand knob and turn the knob counter clockwise 1/2 to 1 full turn to reduce the pressure. Do not overturn and remove the knob!
6. Extend the ram down until it reaches the heal blocks. Hold the lever in the down position and read the pressure on the pressure gauge.
7. Slowly turn the knob (A) of the regulator in or out as desired to set the desired pressure. **NEVER EXCEED THE MAXIMUM RAM PRESSURE SETTING!**





8. When the pressure is set, hold the knob in position and lightly tighten the lock nut to hold the knob and prevent inadvertent pressure changes.

Main Cylinder Direction Control Valve

The selector valve and the main direction control valves are located on the top cover of the hydraulic unit.

The Selector valve is a 2 position switching valve. It is used to direct oil flow to either the main cylinder directional valve, or to the side cylinder directional valve.

Push the Selector valve lever inward to the Main Ram position to direct oil flow to the main directional valve.

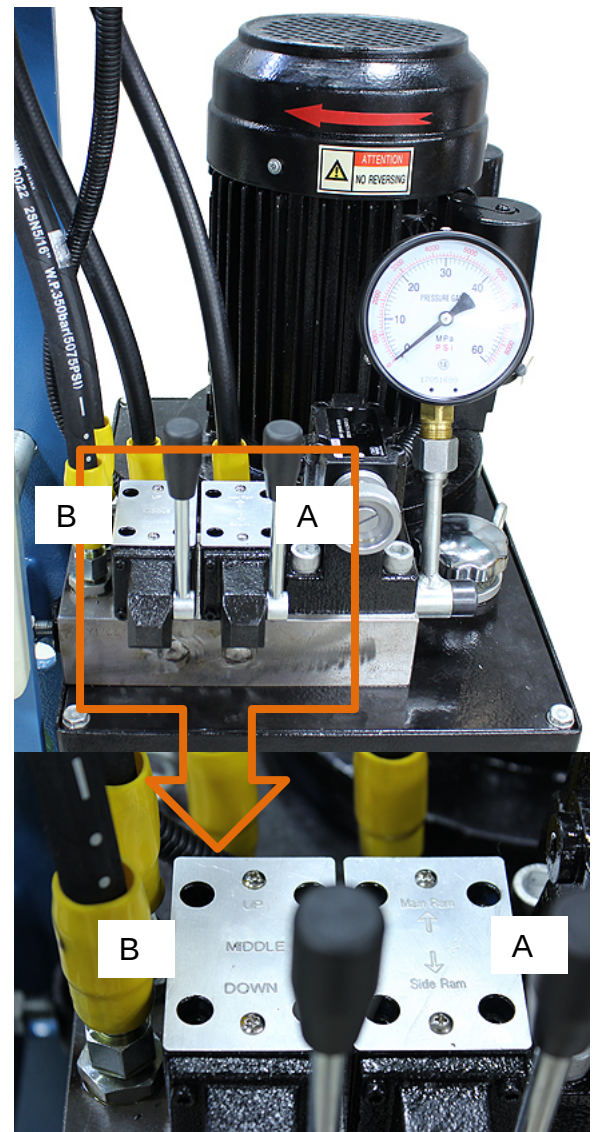
The Main Directional valve is a 3 position spring return to center valve:

- Middle position: When the lever has not been operated, the valve will always return to this position. There is no movement of the piston.
- Up position: When the lever is pushed inwards, the piston of the cylinder will raise. As long as the valve is operated, the piston will move until it is fully retracted. When the lever is released, the piston will stop and stay in this position. The lever will return to the middle position.
- Down position: When the lever is pulled outwards, the piston of the cylinder will extend. As long as the valve is operated, the piston will move. When the lever is released, the piston will stop and stay in this position. The lever will return to the middle position.

Pressure Gauge

The pressure gauge is located on the top cover of the hydraulic unit. The gauge gives the pressure in mPa and PSI. The maximum pressure for this press is **4350psi. (30mPa)**.

If this maximum pressure is reached, also the maximum capacity of the press is reached.



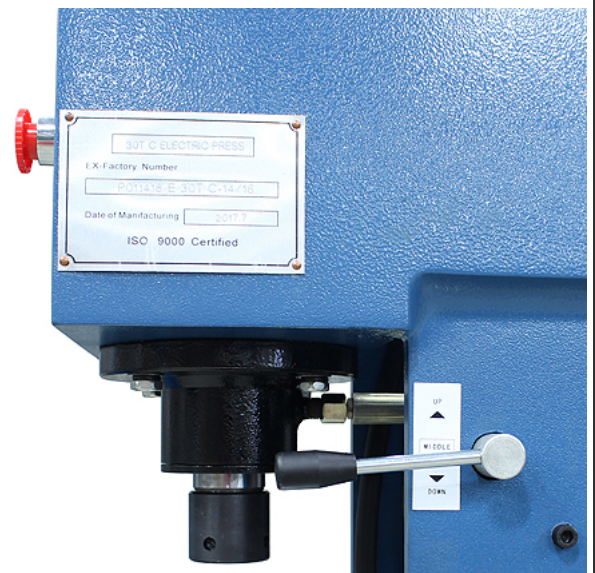


Side Cylinder Direction Control Valve

The Selector valve is a 2 position switching valve located on the top cover of the hydraulic unit. It is used to direct oil flow to either the main cylinder directional valve, or to the side cylinder directional valve. Pull the Selector valve lever outward to the Side Ram position to direct oil flow to the side directional valve.

The Side Directional valve is a 3 position spring return to center valve:

- Middle position: When the lever has not been operated, the valve will always return to this position. There is no movement of the piston.
- Up position: When the lever is pushed upward, the piston of the cylinder will raise. As long as the valve is operated, the piston will move until it is fully retracted. When the lever is released, the piston will stop and stay in this position. The lever will return to the middle position.
- Down position: When the lever is pulled downward, the piston of the cylinder will extend. As long as the valve is operated, the piston will move. When the lever is released, the piston will stop and stay in this position. The lever will return to the middle position.



Pressure Gauge

The pressure gauge is located on the end of the press frame next to the side station E-Stop. The gauge gives the pressure in mPa and PSI. The maximum pressure for this press is **1300psi. (9mPa)**. If this maximum pressure is reached, the maximum capacity of the press is reached.

Air Purge

When starting up for the first time or when maintenance on the hydraulic system has been performed, the hydraulic system needs to be purged.

1. Make sure there is no work piece on the table.
2. Start the hydraulic unit.
3. Place the selector valve in the main ram position.
4. If not already fully retracted, use the directional control valve to fully retract the ram.
5. Extend the ram to the fully lowered position.



6. Now fully retract the ram.
7. Repeat this complete cycle at least 6 times to be sure all air is out of the system.
8. Switch the selector valve to the side ram position and repeat the steps for the side ram.



IMPORTANT: Air in the hydraulic system can cause unexpected piston movement and poor overall press operation.

Cylinder Positioning

This press is equipped with a movable cylinder which makes it possible to position the cylinder correctly aligned with the work piece.

To move the cylinder:

1. Lift the two lever handles upward to loosen the clamping cams.
2. Move the complete cylinder to the left or right.
3. Pull downward on the levers when the cylinder is in the correct position over the workpiece.





Table Adjustment



IMPORTANT: NEVER lift or lower the table with tooling or material or pressure from the ram on the table. This will damage the machine voiding the warranty.

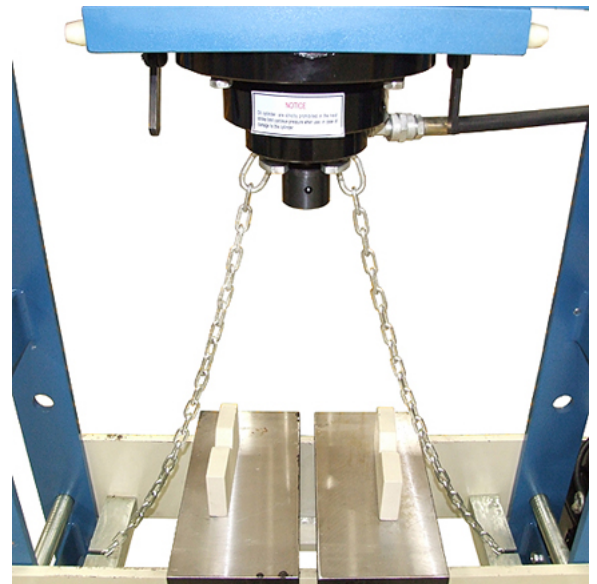
Lifting the table is performed using the lifting chain attached from the ram to the table.

1. If lifting the table; start with the piston extended to full stroke. If lowering the table; start with the piston extended about 1" (25mm).
2. Loosen the piston head enough to allow the lift chain clevis to slip between the head and the ram. Snug to head to the clevis to hold it in position.
3. Place the links of the lifting chains in the slots of the table lift links. Remove as much slack from the chains as possible.
4. Raise the piston enough to lift the table to remove the table support pins.
5. Lower or raise the table high enough to align the support holes of the table and the frame and then install the support pins.



Note: The table always needs to be higher than the hole you want to place the support pin. It may be necessary to reach the desired table position in more than one step.

6. The support pin is installed correctly when the collar is tight to the table and the table slot rests fully on the pin.
7. Lower the table until it rests on the support pin(s).
8. Remove the lifting chain out of the working area.





OPERATION



CAUTION: Always wear proper eye protection with side shields, safety footwear, and leather gloves to protect from burrs and sharp edges.

1. Place the work piece on the table so that it is aligned with the piston rod. If this is not possible, reposition the cylinder to achieve the best alignment.



WARNING: Failure to center the piece part on the blocks and the ram to the piece part may cause serious injury. Never compress springs or objects that when compressed, could shatter, or explode out of the press causing serious injury.

2. Take care when performing operation on elements that are likely to fly off, break (especially casting element and hardened elements) or bounce up as a result of the applied force. In this case, a cover must be installed around the work piece or the operator should stand at a safe distance.
3. After correct placement of the work piece, pressing force can be applied using the directional valve or the hand pump as described in the previous section.



Note: Whenever possible, set the hydraulic pressure to the lowest pressure that will complete the pressing operation. Never exceed the maximum pressure for the ram being used.



Note: Upwards movement of the piston is only allowed for adjustment of the table or returning the piston to its start position. Any other use of the return stroke (e.g. stretching) can result in broken parts and de-function of the press.

When pressing operations are finished:

4. Return the piston back to its upper position.
5. Position the cylinder back to the center of the machine.
6. Turn off the hydraulic unit.
7. Clean up the machine and working area.



UNDERSTANDING SPRINGBACK

Springback, also known as elastic recovery, is the result of the metal wanting to return to its original shape after undergoing compression and stretch. After the bending leaf is removed from the metal and the load is released, the piece part relaxes, forcing the bent portion of the metal to return slightly to its original shape. The key to obtaining the correct bend angle is to over bend the metal a little and allow it to spring back to the desired angle. All metals exhibit a certain amount of spring back.

MATERIAL SELECTION



CAUTION: It must be determined by the customer that materials being processed through the machine are NOT potentially hazardous to operator or personnel working nearby.

When selecting materials keep these instructions in mind:

- Material must be clean and dry. (without oil)
- Material should have a smooth surface so it processes easily.
- Dimensional properties of material must be consistent and not exceed the machine capacity values.
- Chemical structure of material must be consistent.
- Buy certificated steel from the same vendor when possible.



LUBRICATION AND MAINTENANCE



WARNING: Make sure the electrical disconnect is OFF before working on the machine.

Maintenance should be performed on a regular basis by qualified personnel.

Always follow proper safety precautions when working on or around any machinery.



***Note:** Proper maintenance can increase the life expectancy of your machine.*

Daily Maintenance

- Check daily for any unsafe conditions and fix immediately. In case of leakages, damaged parts or bare electric cables; do not use the machine before it is repaired.
- Check that all nuts and bolts are properly tightened.
- Lubricate threaded components pivot points and sliding devices.
- Check hydraulic hoses and fittings for leakage.
- Keep area around machine clear of debris.
- Clean the outside of the press with a clean, soft, and dry cloth.
- When not in use, keep the press dry and covered. Keep the ram and piston fully retracted to prevent rust or corrosion.
- If press efficiency drops, purge air from the hydraulic system.

DO NOT allow lubricant on the frame bed or the heel blocks. Wipe off immediately.

Weekly Maintenance

- On a weekly basis clean the machine and the area around it.
- Apply rust inhibitive lubricant to all non-painted surfaces.
- Check oil level of the hydraulic unit.
- Check electrical connections.
- Check lifting chains.

6 Month Maintenance

- Inspect all hydraulic fittings and hoses and tighten any loose connections.



Yearly Maintenance

- Replace the hydraulic oil of the unit.

Changing the Hydraulic Oil

The hydraulic oil is the primary medium for transmitting pressure and also must lubricate the running parts of the pump.

Replace the hydraulic oil at least once a year.

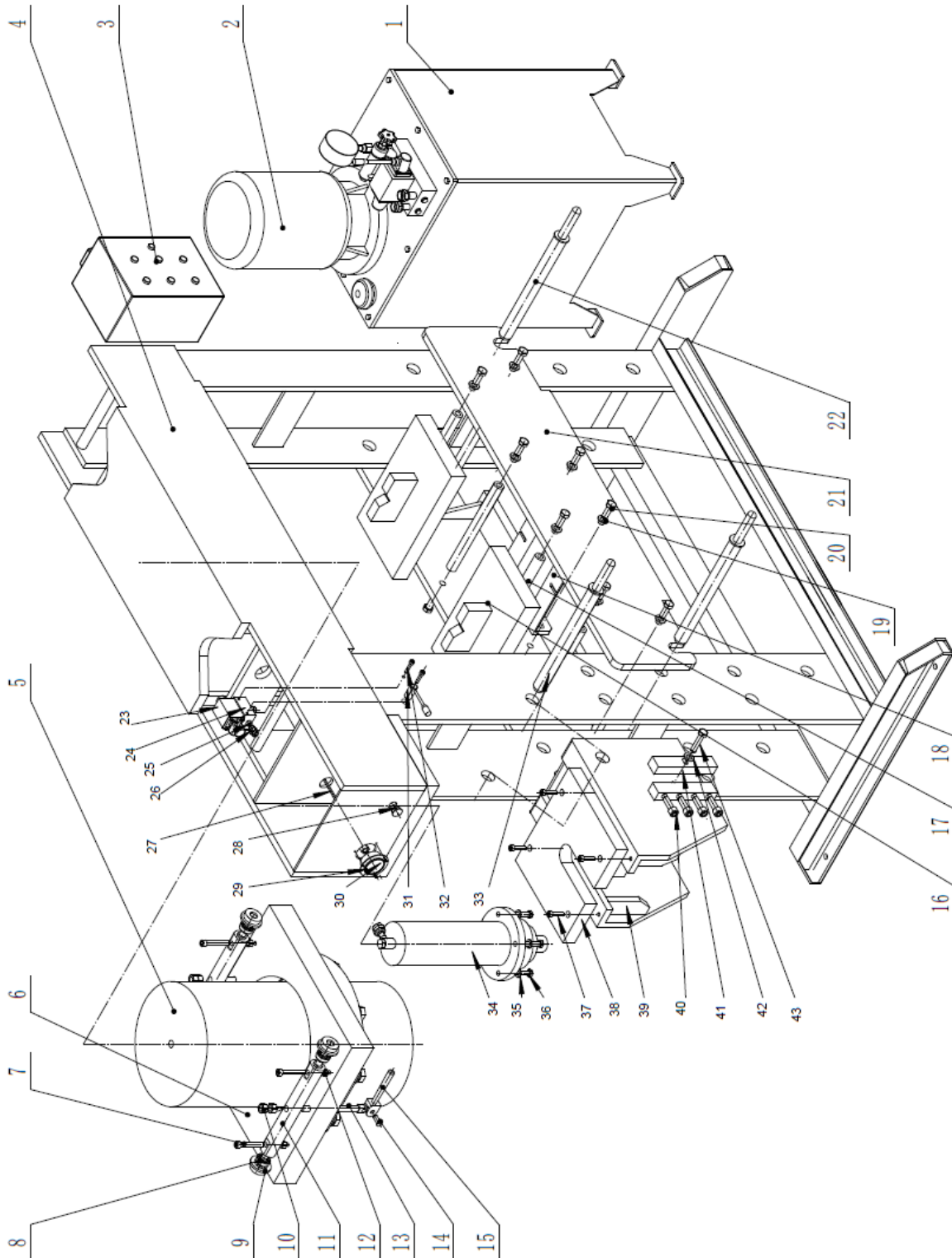
1. A drain plug is located at the bottom of the oil tank. Place a suitable container under the drain plug and remove the plug and allow the oil to drain into the container.
2. If the inside of the tank is not clean, remove the top cover of the tank and clean the tank inside.
3. Check the drained oil. If there are metal particles visible, or if the oil has a grey color. This can indicate worn out parts in the cylinder or the hydraulic unit.
4. Take care to prevent dirt and water getting inside the oil tank. Replace the drain plug and if removed the cover.
5. Fill with hydraulic oil #68 SHELL BRAND or an equivalent with similar specifications.
6. Replace the oil fill cap.
7. Purge air from the hydraulic system.

Oil Disposal

Used oil products must be disposed of in a proper manner following your local regulations.



OVERALL MACHINE PARTS DIAGRAM



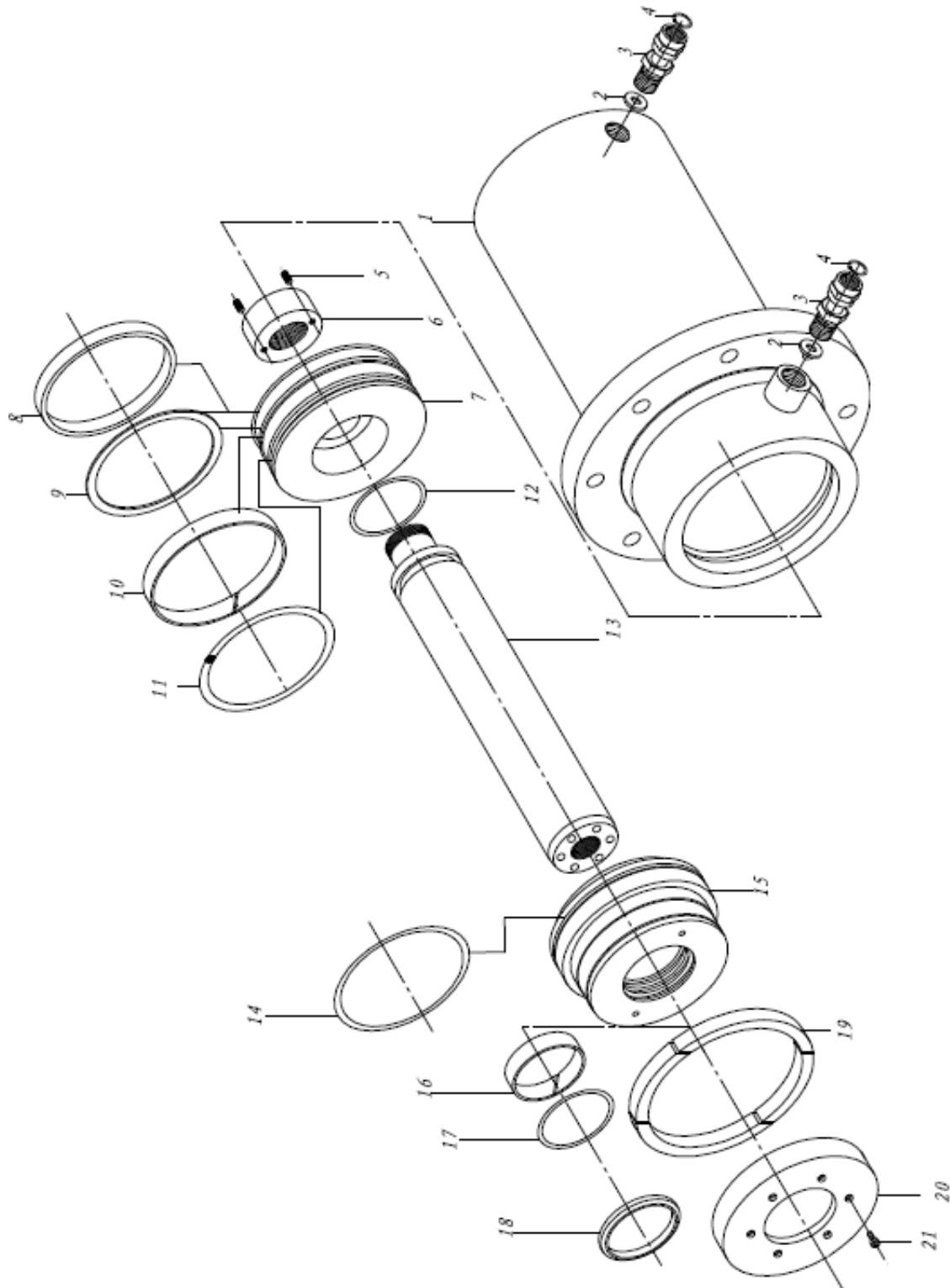


Overall Machine Parts List

Item	Description	Qty	Item	Description	Qty
1	Electric Pump	1	23	Side Ram handle Valve	1
2	Electric Motor	1	24	Side Ram handle Valve Base	1
3	Electric Box	1	25	Seal Ring 8	4
4	Frame	1	26	Connector	3
5	Ram Assy	1	27	Side Ram Gauge Pipe	1
6	Ram Assy Plate	1	28	Emergency Stop	1
7	Bolt M12×100	2	29	Bolt M3*12	3
8	Bearing	4	30	Side Ram Gauge	1
9	Roller	4	31	Side Ram handle Valve Handle	1
10	Nut M16	4	32	Bolt M8*35	2
11	Roller Shaft	2	33	Side Ram Table Pin	1
12	Nut M12	4	34	Side Ram Assembly	1
13	Lock Rod	2	35	Bolt M16*65	6
14	Pin	2	36	Washer M16	6
15	Lock Handle	2	37	Bolt M10*45	4
16	Heal Block	2	38	Side Ram Table	1
17	Fixed Rod	6	39	Side Ram Table Base	1
18	Chain Rod	2	40	Bolt M20*50	8
19	Washerφ18	16	41	Plate	2
20	Bolt M18×50	16	42	Washer M12	2
21	Working Table	2	43	Bolt M12*60	2
22	Support Pin	2			



MAIN RAM PARTS DIAGRAM



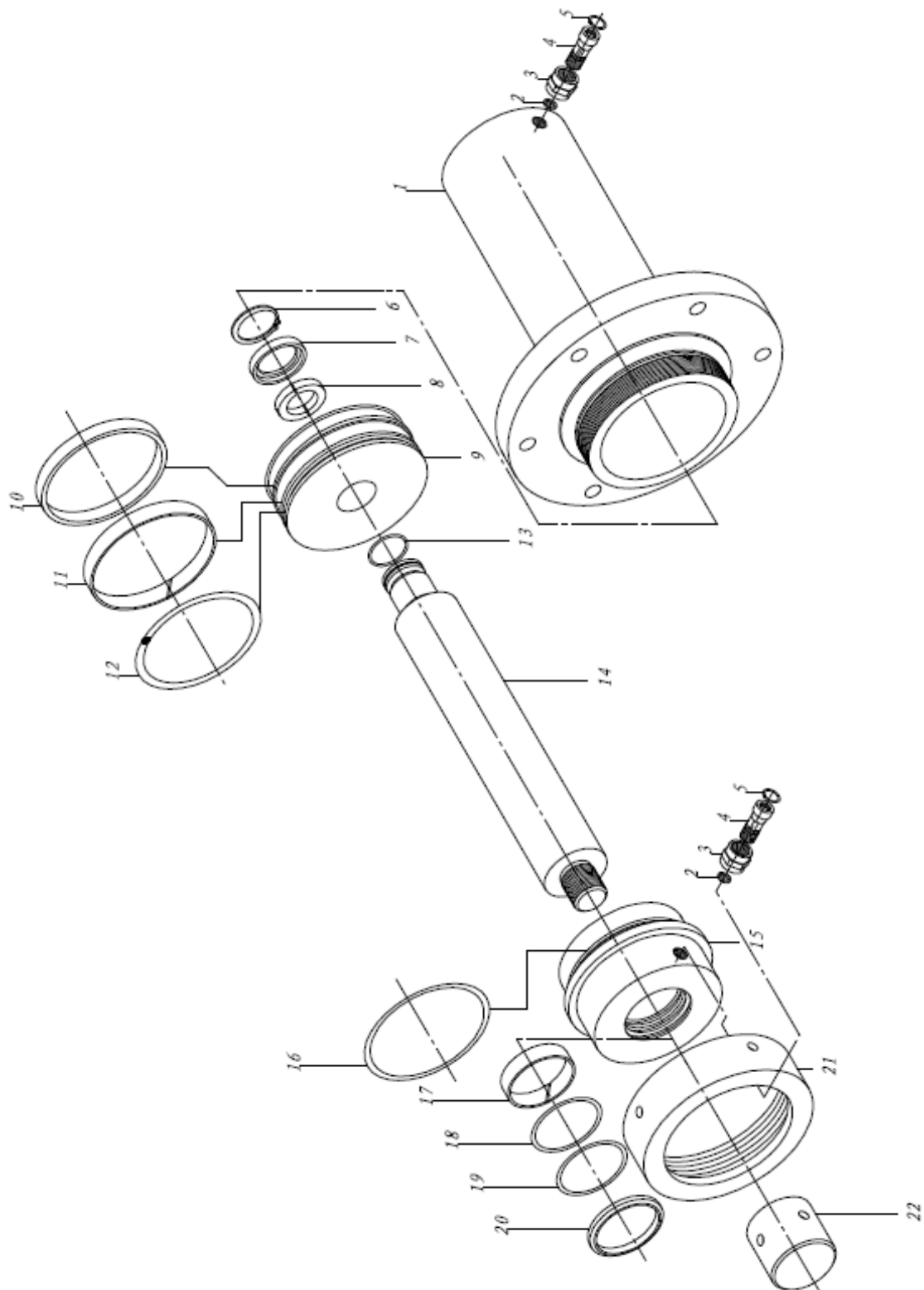


Main Ram Parts List

Item	Description	Qty
MR1	Cylinder	1
MR2	O Ring	2
MR3	Oil Hose Connector	2
MR4	Oil Ring 18×2.4	2
MR5	Hexangular M10×35	2
MR6	Screw Nut	1
MR7	Piston Head	1
MR8	Seal Ring D280	1
MR9	Seal Ring 280×264	1
MR10	Seal Ring 25×3×869	2
MR11	Seal Ring 280×8.6	1
MR12	Seal Ring 160×3.1	1
MR13	Piston	1
MR14	O ring 280×5.7	1
MR15	Ram Cap 1	1
MR16	Seal Ring 25×3×510	2
MR17	O Ring 170×5.7	2
MR18	O Ring 160	1
MR19	Seal Ring	1
MR20	Lock Plate	1
MR21	Hexangular Bolt M8×20	6



SIDE RAM PARTS DIAGRAM



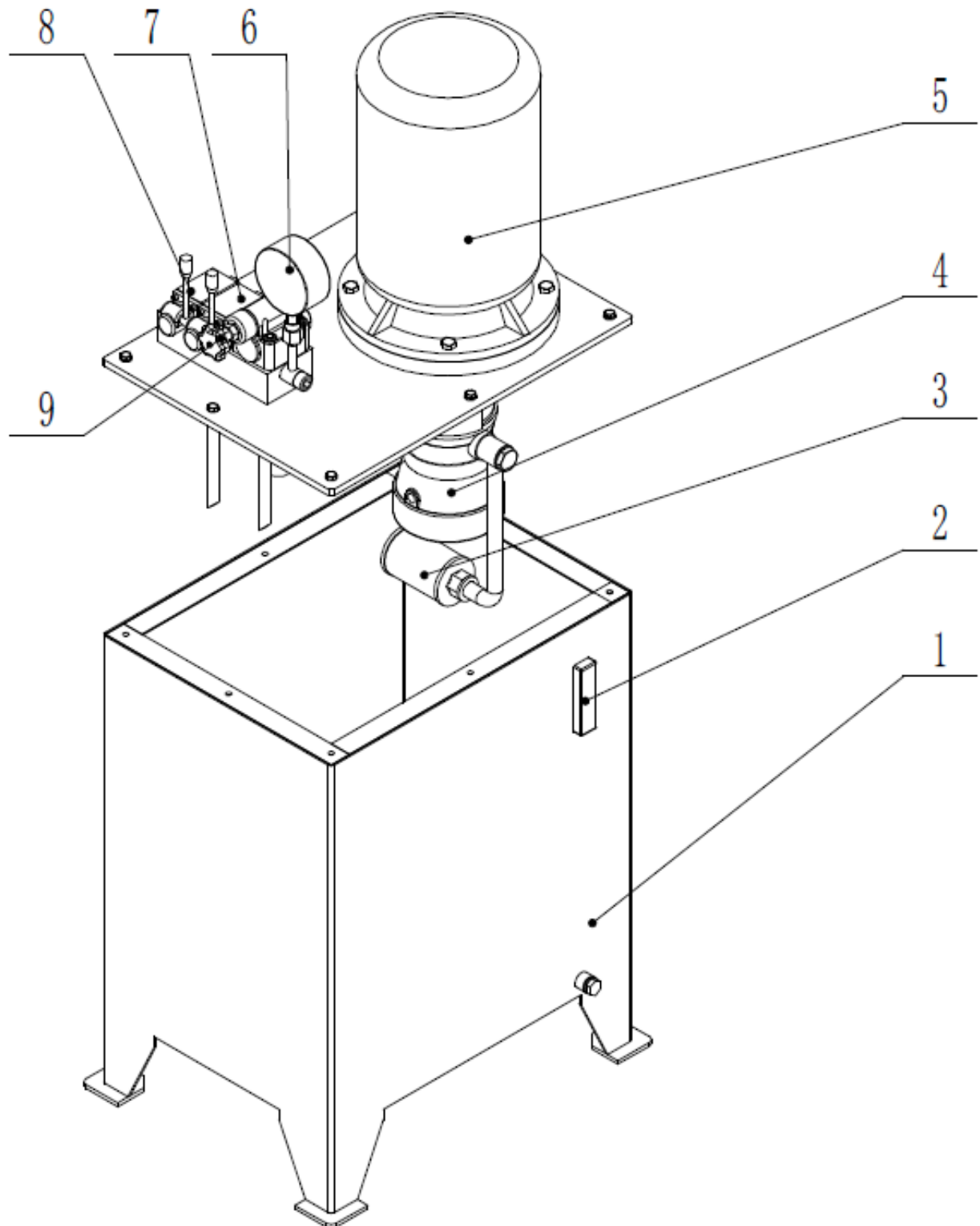


Side Ram Parts List

Item	Description	Qty
SR1	Cylinder	1
SR2	O Ring ϕ 10	2
SR3	Nut	2
SR4	Oil Hose Connector	2
SR5	O Ring18 $\times$ 2.4	2
SR6	Circlip 50	1
SR7	Ring Cap	1
SR8	Ring	1
SR9	Piston Head	1
SR10	Seal Ring	1
SR11	Seal Ring 20 $\times$ 3 $\times$ 499	1
SR12	Seal Ring 160 $\times$ 5.7	1
SR13	Seal Ring 50 $\times$ 3.1	1
SR14	Piston	1
SR15	Ram Cap 1	1
SR16	Seal Ring160 $\times$ 3.1	1
SR17	O Ring 20 $\times$ 3 $\times$ 260	1
SR18	O Ring 90 $\times$ 5.7	1
SR19	O Ring 90 $\times$ 5.7	1
SR20	O Ring 80	1
SR21	Ram Cap 2	1
SR22	Serrated Saddle	1



HYDRAULIC PUMP PARTS DIAGRAM



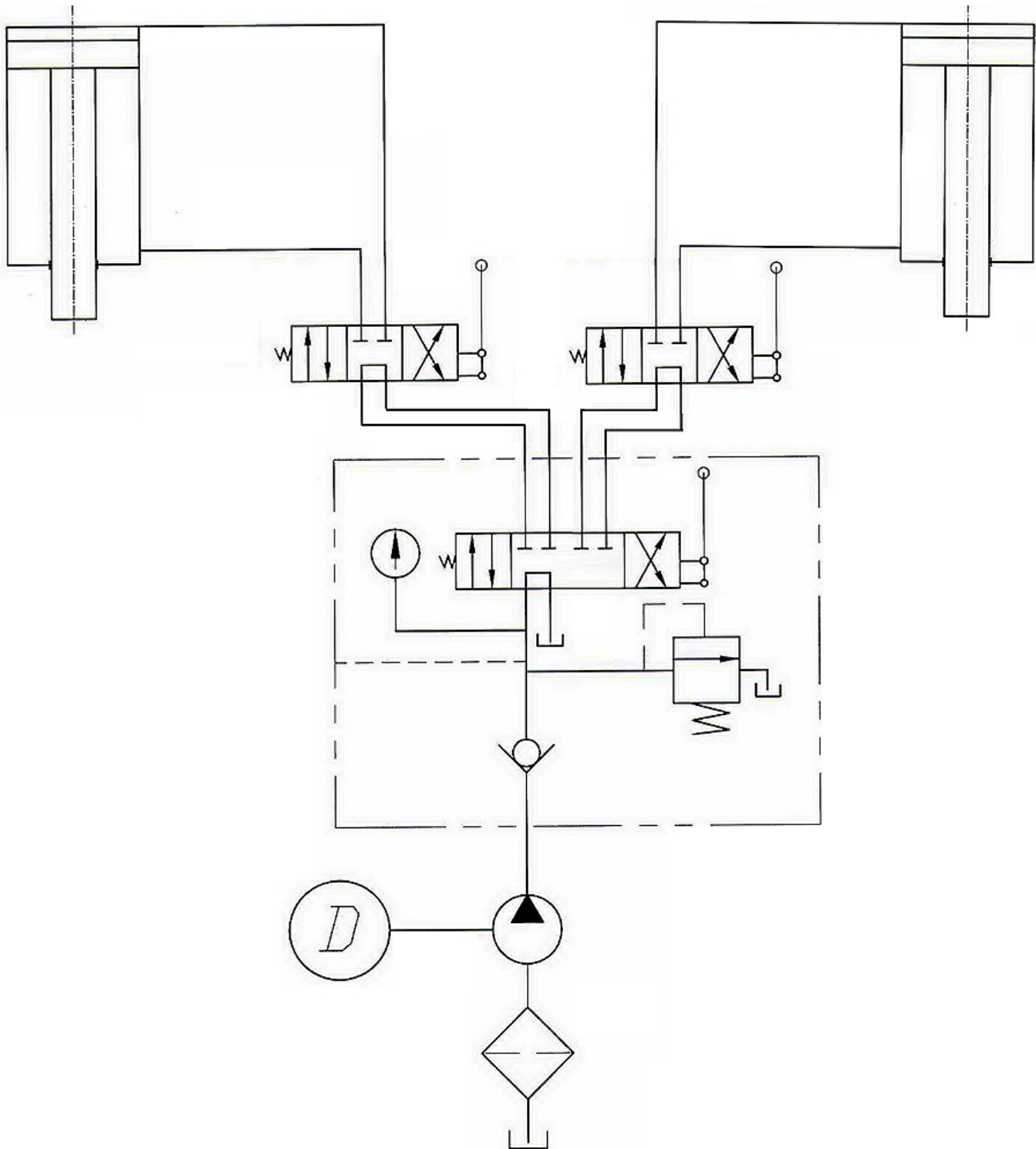


Hydraulic Pump Parts List

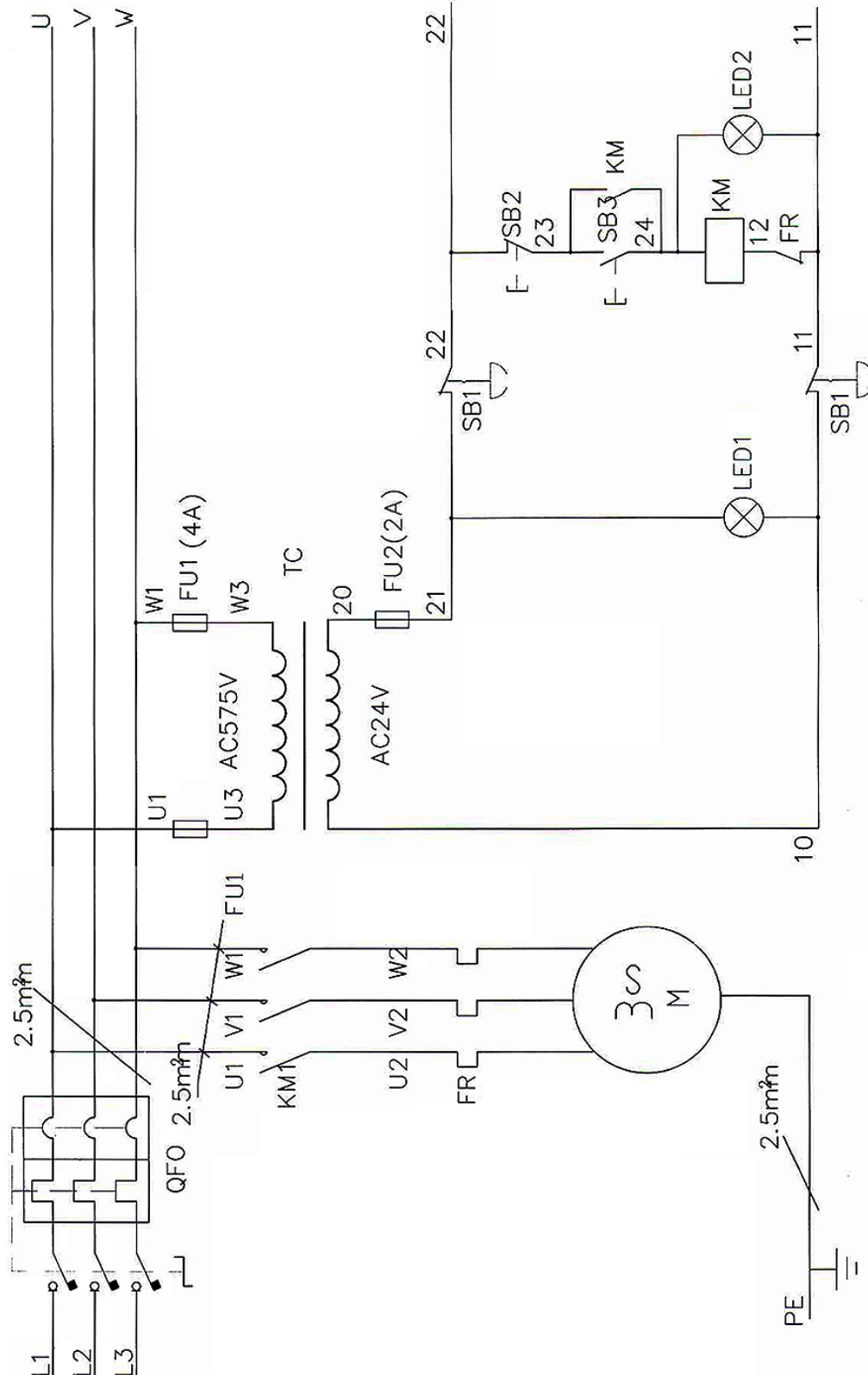
Item	Description	Qty
P1	Oil Tank	1
P2	Oil Gauge	1
P3	Oil Filter	1
P4	Piston Pump	1
P5	Electric Motor	1
P6	Pressure Gauge	1
P7	Ram Working Choose Valve	1
P8	Main Ram Hand Operated Valve	1
P9	Pump Pressure Adjust Valve	1



HYDRAULIC DIAGRAM



ELECTRICAL SCHEMATIC





TROUBLESHOOTING



WARNING: Make sure the electrical disconnect is OFF before working on the machine.

FAULT	PROBABLE CAUSE	REMEDY
Low Pressure	Gauge Failure Plugged oil passage in relief valve or check valve. Oil leak at hose fittings. Oil leak with-in cylinder. Oil filter plugged.	Check pressure gauge. Repair or replace as needed. Clean valve(s). Replace if needed. Check and tighten any loose or leaking fittings. Replace cylinder oil seals. Clean hydraulic tank and system.
Slow operation	Oil very thick due to cold temperature. Low oil level sucking air into the system. Oil leak.	Normal oil operation temperature is 68-104°F (20-40°C). Control oil temperature as needed. Check oil level. Add oil as/if needed. Repair any oil leak(s) immediately.

NOTES



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