



OPERATOR'S MANUAL

Metal Working



HORIZONTAL PRESS BRAKE

MODEL: HPB-20



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THANK YOU & WARRANTY

Thank you for your purchase of a machine from Baileigh Industrial Holdings LLC. 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 an 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 an 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 10 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, (f) 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 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 attorney 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 Holdings LLC 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 Holdings LLC 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.



INTRODUCTION

The quality and reliability of the components assembled on a Baileigh Industrial Holdings LLC 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
- Setup 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 Holdings LLC 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.



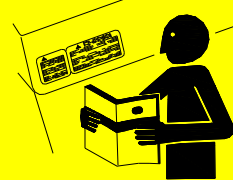
Note: This symbol refers to useful information throughout the manual.



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. **NOTICE**, which is not related to personal injury, is used without a symbol.

DANGER: Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING: Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION: Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE: Indicates a situation which, if not avoided, could result in property damage.

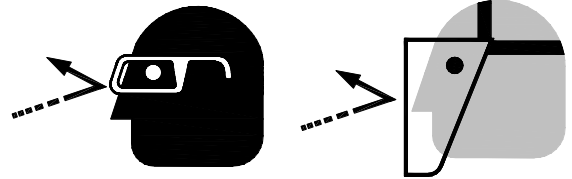


SAVE THESE INSTRUCTIONS.
Refer to them often and use them to instruct others.



PROTECT EYES

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



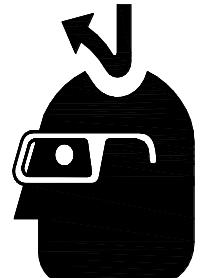
PROTECT AGAINST NOISE

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



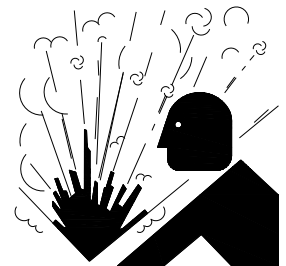
KEEP CLEAR OF MOVING OBJECTS

Always be aware of the position of the material swing path. The material will move quickly during the bending process causing serious body or head injuries.



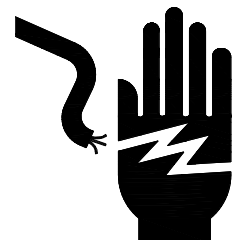
HYDRAULIC HOSE FAILURE

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



HIGH VOLTAGE

USE CAUTION IN HIGH VOLTAGE AREAS. DO NOT assume the power to be off.



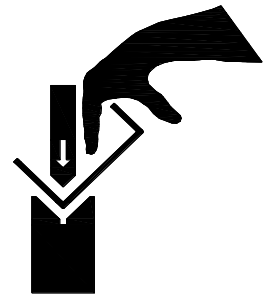
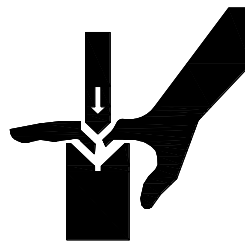
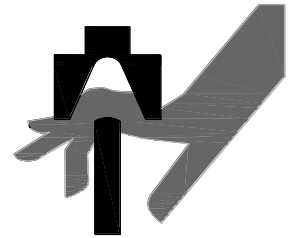
FOLLOW PROPER LOCKOUT PROCEDURES.



BEWARE OF PINCH POINTS AND CRUSH HAZARD

Keep hands and fingers from between the punch and die when bending materials to avoid possible injury.

NEVER place your hands, fingers, or any part of your body in the die area of this machine.



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.



CALIFORNIA PROPOSITION 65

WARNING: Cancer and Reproductive Harm.
www.P65Warnings.ca.gov





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 will not 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 THE 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 machine's 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 appropriately.** **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 protection.** Always wear ISO approved protective eye wear when operating machinery. Wear a full-face shield if you are producing metal filings. Eye wear shall be impact resistant, protective safety glasses with side shields which comply with ANSI Z87.1 specification. Use of eye wear which does not comply with ANSI Z87.1 specification could result in severe injury from breakage of eye protection.
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. Keep visitors a safe distance from the work area.
18. **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.
19. **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.
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. Keep **all** cords dry, free from grease and oil, and protected from sparks and hot metal.
23. Inspect power and control cables periodically. Replace if damaged or bare wires are exposed. **Bare wiring can kill!** **DO NOT** touch live electrical components or parts.
24. **DO NOT** bypass or defeat any of the safety interlock systems.



TECHNICAL SPECIFICATIONS

Pressure	20 tons
Punch Height	6" (152.4mm)
Included Die V-Grooves	2" and 2.5" (50.8mm and 63.5mm)
Included Punch	40°
Cylinder Stroke Length x Diameter	12" x 4" (304.8 x 101.6mm)
Table Height	39" (990.6mm)
Maximum Hydraulic Pressure	2750 psi
Working Speed	.51" / second (12.954mm / second)
Return Speed	.78" / second (19.812mm / second)
Stroke Accuracy	+/- .002" (0.0508mm)
Digital Readout	Yes, Cylinder Extension Setting
Fixture Holes*	1 @ 3"Ø / 3 @ 2"Ø
Power	230V, 3ph, 60hz
Motor	5 hp (3.7kw), 230V, 3ph, 60hz, 13.4A, 1720rpm
Gross Weight	1350lbs (613kgs)
Shipping Dimensions (Inches)	60" x 48" x 55" (1524 x 1219 x 1397mm)

* 2" fixture post sold separately.

TECHNICAL SUPPORT

Our technical support department can be reached at 920.684.4990 or Baileigh-service@jpwindustries.com, and asking for the technical support. 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: baileigh-sales@jpwindustries.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.*



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.



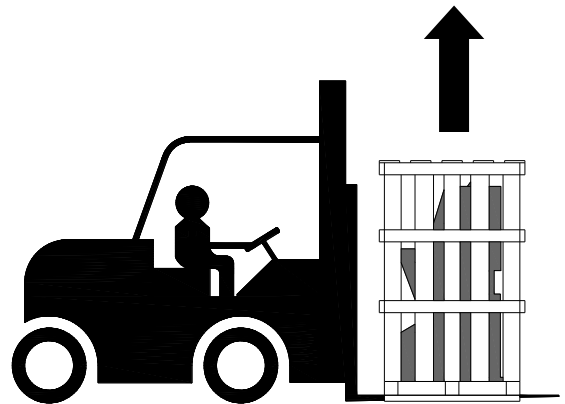


TRANSPORTING AND LIFTING

NOTICE: *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 forklift 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.



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 and 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, then lower slowly until it touches the floor.



INSTALLATION

IMPORTANT:

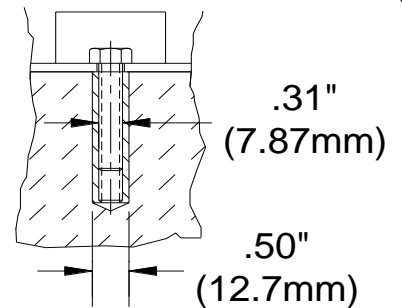
Consider the following when looking for a suitable location to place the machine:

- Overall weight of the machine.
- Weight of material being processed.
- Sizes of material to be processed through the machine.
- Space needed for auxiliary stands, worktables, 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 machine 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. Use bolts and expansion plugs or sunken tie rods that connect through and are sized for the holes in the base of the stand.
- This machine requires a solid floor such as concrete at a minimum of 4" (102mm) thick, 6" (153mm) minimum is preferred.



Tank Filling

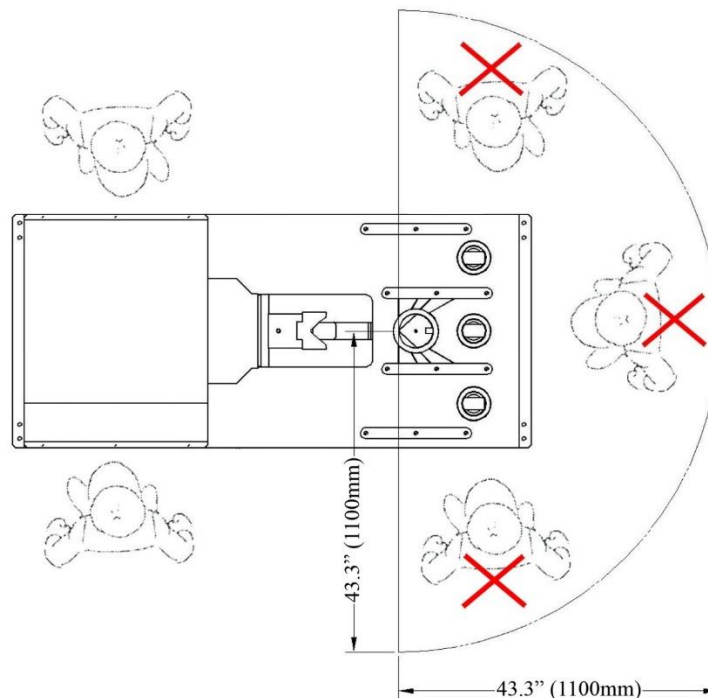
The hydraulic oil is the primary medium for transmitting pressure and also must lubricate the running parts of the pump.

After installation of the machine and before machine startup, bring the oil level up to 90% of capacity. Reference any labels or markings affixed to the outside of the machine. If none exist, use SHELL BRAND #46 or #68 hydraulic oil or an equivalent with similar specifications. (Based upon location temperature and availability.)

Verify that any cylinder rams are in the retracted position to prevent overfilling of the tank. Recheck the oil level after the first few hours of operation and again after the first full week of operation.

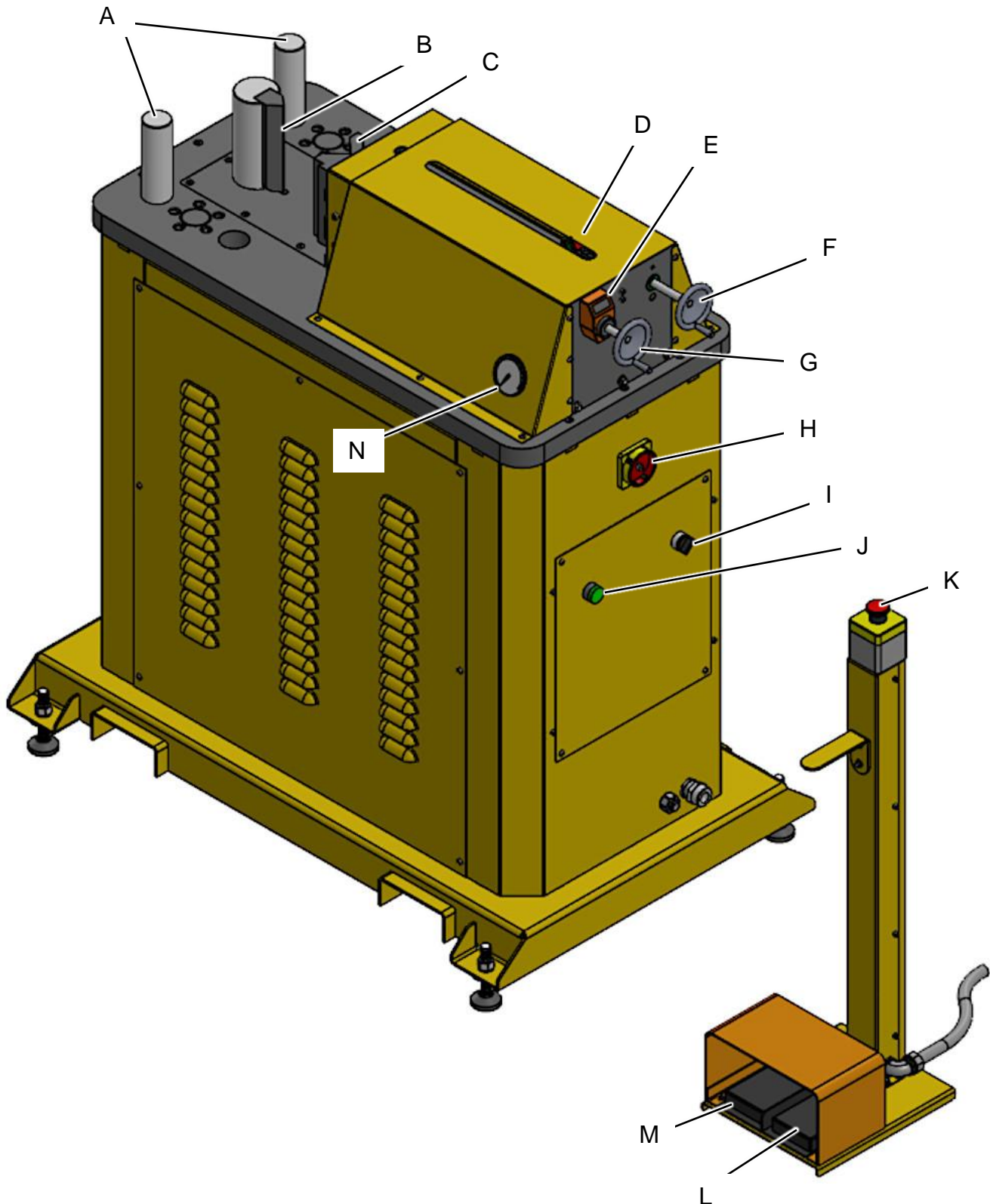
A shortage of hydraulic oil can cause hydraulic system breakdown and damage to major mechanical parts due to overheating.

OPERATOR POSITIONING





GETTING TO KNOW YOUR MACHINE





Item	Description	Function
A	Secondary Bend Pins	Keyed pins which may be used for any manner of bending, counter bending, or support of other tooling.
B	Main Bend Pin	Keyed pin used to hold the bending punch.
B1	Bend Punch	40° wedge retained by the main bend pin used to create the desired bend angle with a generally square internal bend corner.
C	Bending Die	The V-grooved die that the material is pressed into during the bend.
D	Ram Position Indicator	Indicates the approximate extension or retraction of the bending cylinder. This may be used with the adjustment handwheels to set the stroke of the bending cylinder.
E	Ram Extension Counter	A visual digital scale which may be used to set repeatable bending cylinder extension distance and thus repeatable bends.
F	Ram Retraction Adjustment Handwheel	Sets the distance that the bend cylinder retracts. This is used to stop the cylinder retraction when the die has been pulled back far enough to remove and then load material for the next bend.
G	Ram Extension Adjustment Handwheel	Sets the distance that the bend cylinder extends. This is used to stop the cylinder extension when the V-block and material being bent, are pressed into the bending punch. This sets the finished bend angle. This angle will be repeatable and when used with the Extension Counter may be returned to at a later date.
H	Main Power Disconnect Switch	The main switch used to supply power to or lock out power for the operating system.
I	Jog / Auto Selector Switch	Selects between Jog mode typically used for setup and Auto mode which will retract automatically when the extension limit switch is activated.
J	Hydraulic Pump Start Switch	Starts and runs the hydraulic pump which in turn operates the ram for bending.



Item	Description	Function
K	Emergency Stop Switch	Stops all functions including the hydraulic pump operation.
L	Ram Forward Foot Pedal	Pressing the Forward pedal extends the bending cylinder.
M	Ram Reverse Foot Pedal	Pressing the Reverse pedal retracts the bending cylinder.
N	Hydraulic System Pressure Gauge	Displays the operating pressure at the moment of viewing.

ASSEMBLY AND SETUP



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.

This horizontal press is functionally fully assembled. The only assembly will be to install the leveling pads, place the bender, and make the proper electrical connections.

1. Remove the machine from the skid it was shipped on.
2. Position the machine as desired following the installation guidelines to be certain that the machine is supported evenly at all contact points.
3. Be sure to rest machine on a flat surface, using the adjusting screws to level.
4. Follow the electrical guidelines to connect the machine to a power supply.
5. Read through the remainder of the manual and become familiar with the die installation and settings as well as normal operation.



ELECTRICAL



CAUTION: HAVE ELECTRICAL UTILITIES CONNECTED TO THE 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 machine is wired for 230 volts, 60hz alternating current. Before connecting the machine to the power source, make sure the power source is OFF.

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 an amperage rating slightly higher than the full load current of machine.
- A separate electrical circuit should be used for your machines. 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 machine.
- 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 machine 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 a qualified electrician, or service personnel if the grounding instructions are not completely understood, or if in doubt as to whether the machine 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. Unwrap the 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. Turn the switch OFF when the machine is not in operation.



OPERATION



CAUTION: Always wear proper eye protection with side shields, safety footwear, and leather gloves to protect from burrs and sharp edges. When handling large heavy materials make sure they are properly supported.



CAUTION: Keep hands and fingers clear of the punch and die. Stand off to the side of the machine to avoid getting hit with the material as it is being bent and formed. When handling large heavy materials make sure they are properly supported.

In JOG mode, press the Forward foot pedal for forward motion of the cylinder. The cylinder will travel forward while the pedal is held down and stops if released. The cylinder does not retract until the Reverse pedal is pressed for the backward movement of the cylinder. This mode is useful to set the required cylinder stroke length for the required bend.

In AUTO mode, press the Forward foot pedal and hold. The cylinder will move back and forth between the Back and Forward position. Releasing the switches and the cylinder retract to the Back position. The controller does not move to the next Step in this mode.



BENDING ALLOWANCE

To bend sheet metal accurately, you will need to consider the total length of each bend. This is referred to as bend allowance. Subtract the bend allowance from the sum of the outside dimensions of the workpiece to obtain the actual overall length or width of the piece. Because of differences in sheet metal hardness, and whether the bend is made with the grain or against it, exact allowances must sometimes be made by trial and error. However, bend allowances for general use can be obtained from metal working books or from the Internet.

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 workpiece 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 the 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.

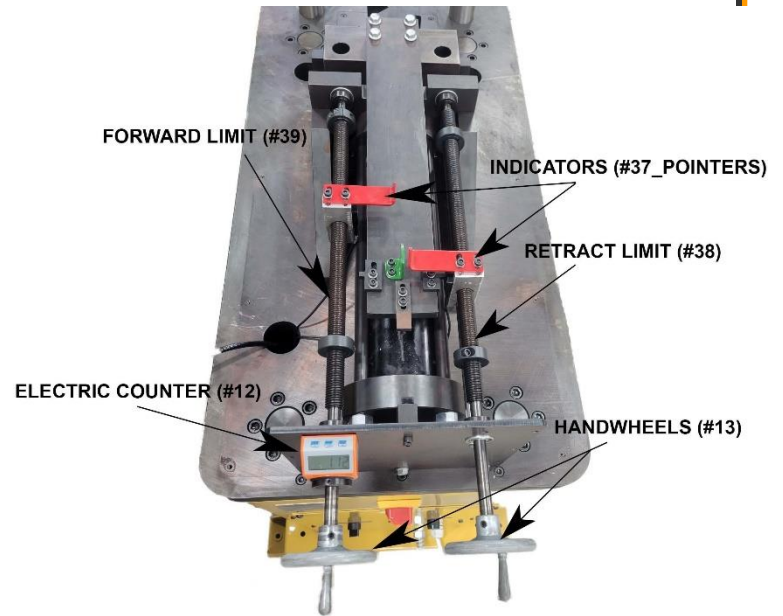


MACHINE ADJUSTMENTS

When making adjustments on the HPB-20, reference the following:

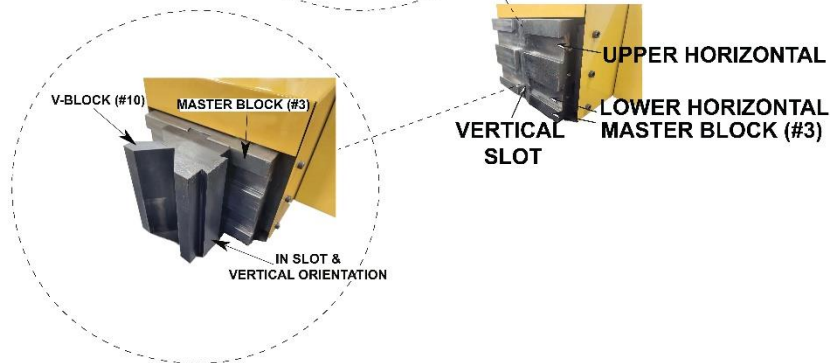
Handwheels (#13):

1. The left handwheel controls the forward limit/bend degrees.
 - a. To increase the forward limit/bend degrees, turn the left handwheel counterclockwise (CCW).
 - b. To decrease the forward limit/bend degrees, turn the left handwheel clockwise (CW).
2. The right handwheel controls the retract limits.
 - a. To reduce the retract amount, turn the right handwheel counterclockwise (CCW).
 - b. To increase the retract amount, turn the right handwheel clockwise (CW).



V-block (#10):

To allow more versatility when bending the part, the operator can place the V-block in either the horizontal or vertical dovetail slots in master block (#3).





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.

- Check daily for any unsafe conditions and fix immediately.
- Check that all nuts and bolts are properly tightened.
- On a weekly basis clean the machine and the area around it.
- Lubricate threaded components and sliding devices.
- Apply rust inhibitive lubricant to all non-painted surfaces.



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

Lubrication

- The power unit oil should be checked monthly.
- If the oil gets really discolored or very dark, it should be changed.
- Check periodically for leaks. Correct immediately.
- Be sure to keep the slide ways and lead screws lubricated with light hydraulic oil or equivalent.
- Check for any worn or damaged parts and replace immediately.



Hydraulic System

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

After installation of the machine and before machine startup, bring the oil level up to 90% of capacity. **A shortage of hydraulic oil can cause hydraulic system breakdown and damage to major mechanical parts due to overheating.**

Hydraulic Oil

Check the oil level in the tank periodically.

Changing the oil after the first 500 working hours. Thereafter, changing the oil after ever 2,000 working hours along with the oil filter.

1. Use SHELL BRAND #46 or #68 hydraulic oil or an equivalent with similar specifications. (Based upon location temperature and availability.)
2. Keep hydraulic reservoir filled to 90% of capacity.
3. **DO NOT** rely totally on the oil gauge as they can sometimes indicate an incorrect level reading. Do a visual inspection with the oil fill cap removed as well.
4. A shortage of hydraulic oil will cause hydraulic system breakdown to major mechanical components due to overheating.
5. Change the hydraulic oil every 2000 working hours along with the oil filter.

Hydraulic Connections

Check the entire hydraulic system for leaks daily. Repair any leaks found before placing the machine in operation. Replace any fitting that will not tighten to stop the leak.

Replace lines and hoses if they have been damaged in any way.

If the valve block is leaking, start by replacing the O-ring and compounding seal ring.

Relief Valve

The adjustment of the relief valve is very important for durable operation of the machine. The value normally set for this adjustment equals the maximum allowed working pressure. If our service engineer finds that a relief valve has been adjusted to a higher valve than allowed, our company will decline all responsibility regarding the guarantee.



Note: *Unless necessary, do not adjust the relief valve, it will affect the capability of the machine.*

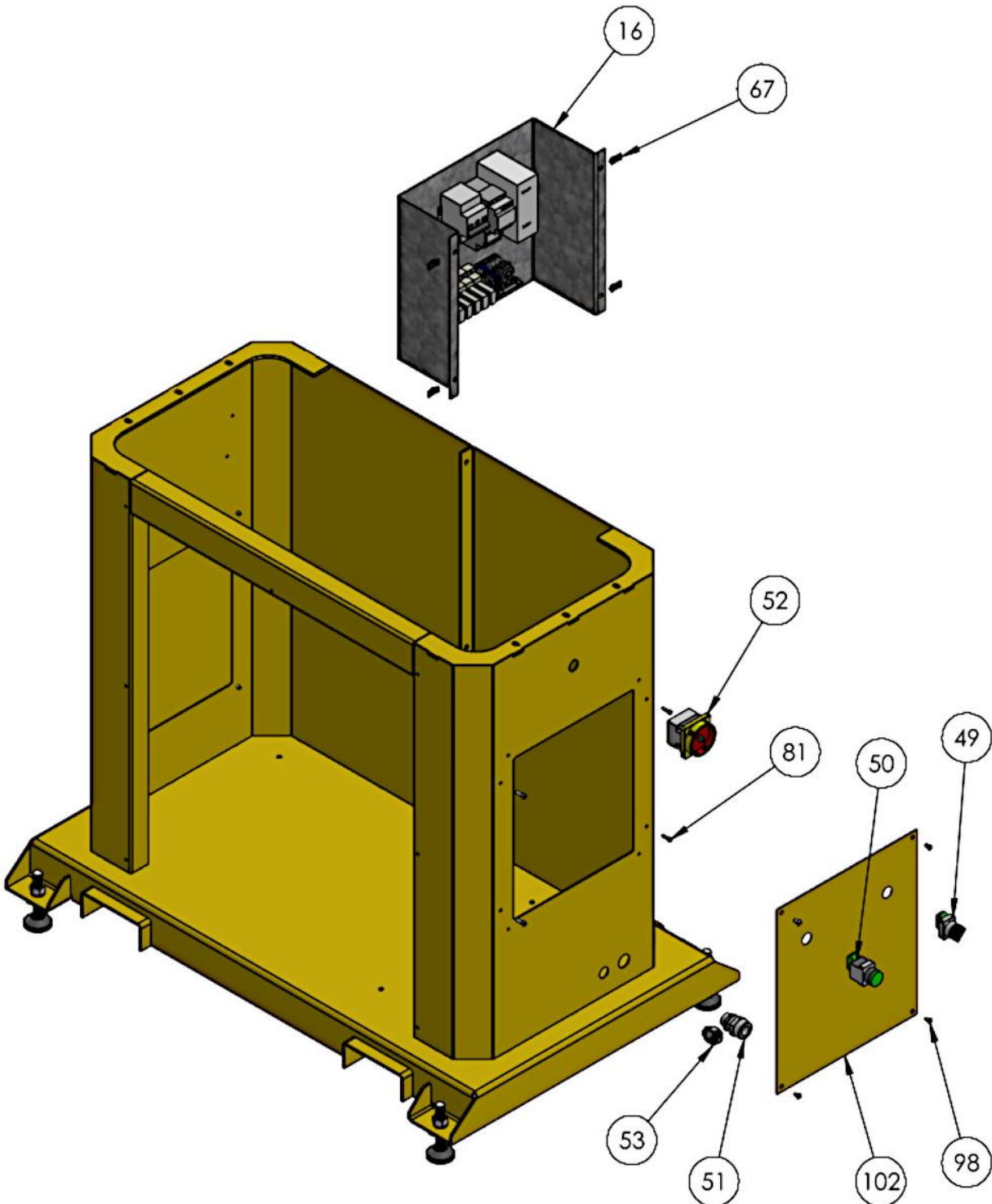
Oil Change and Disposal

- Change the oil in the hydraulic tank after the first 6 months, and every 12 months after that. Clean the filter basket located under the fill cap before refilling the tank. Used oil products must be disposed of in a proper manner following your local regulations.



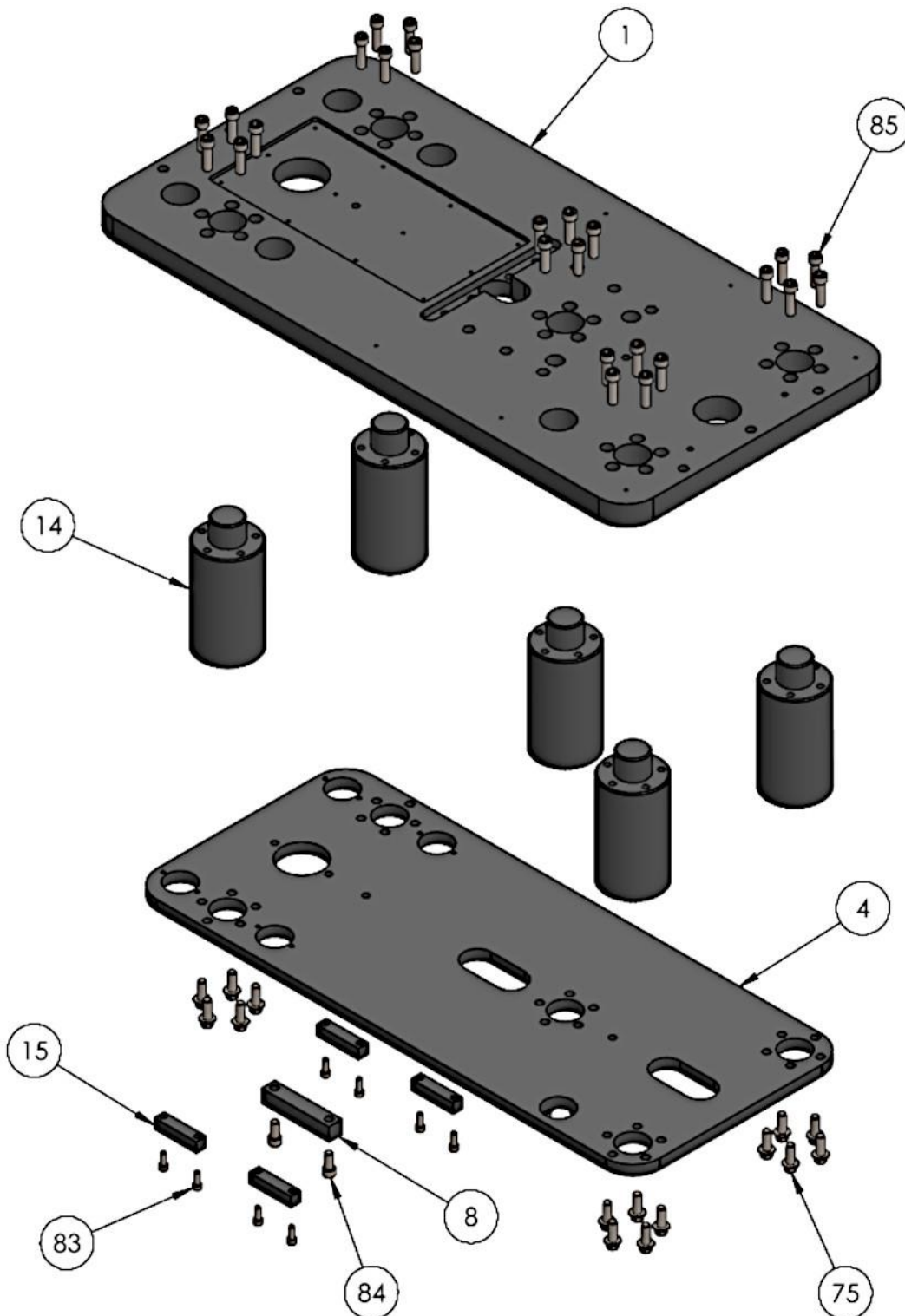


ELECTRICAL PANEL ASSEMBLY PARTS DIAGRAM



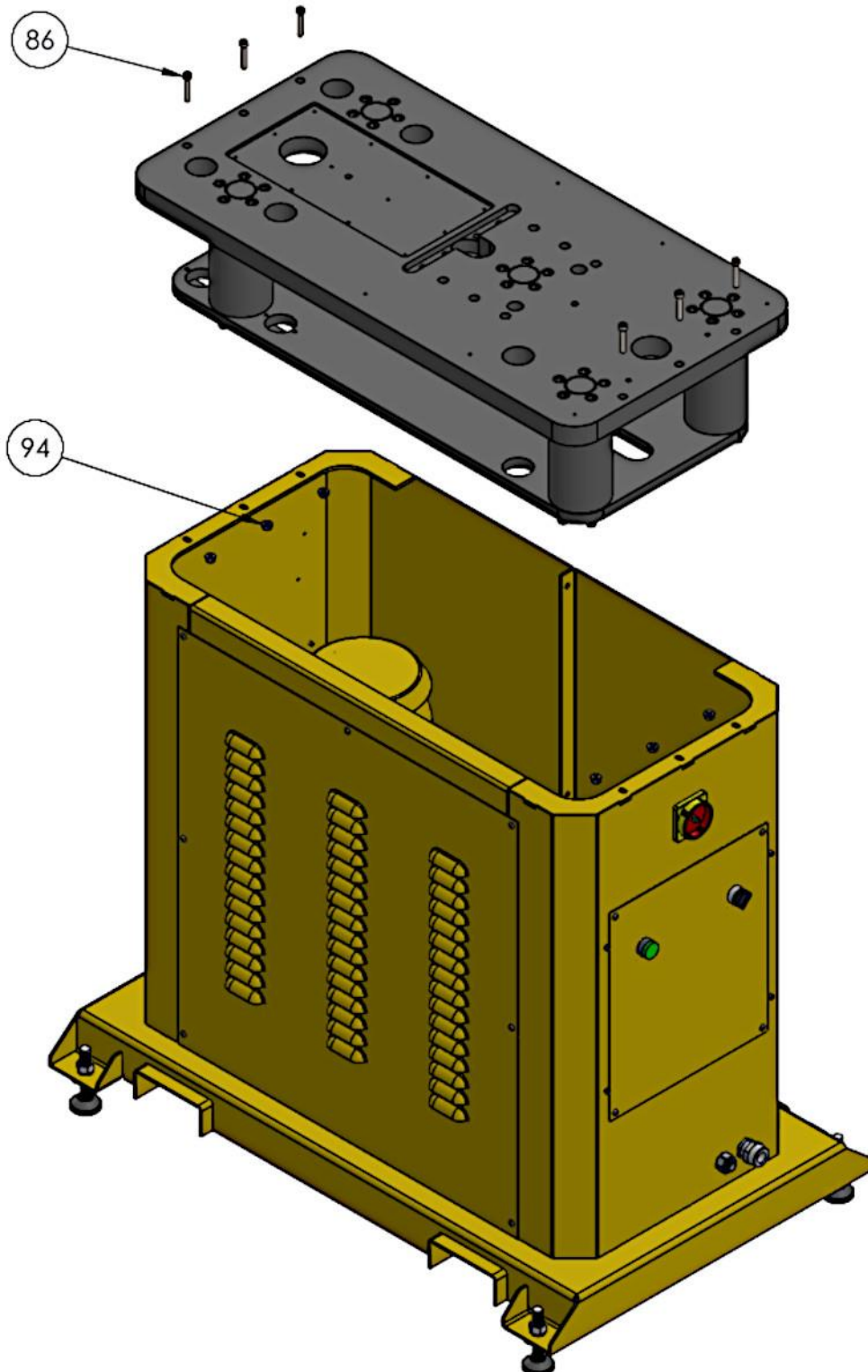


TOP PLATE ASSEMBLY PARTS DIAGRAM





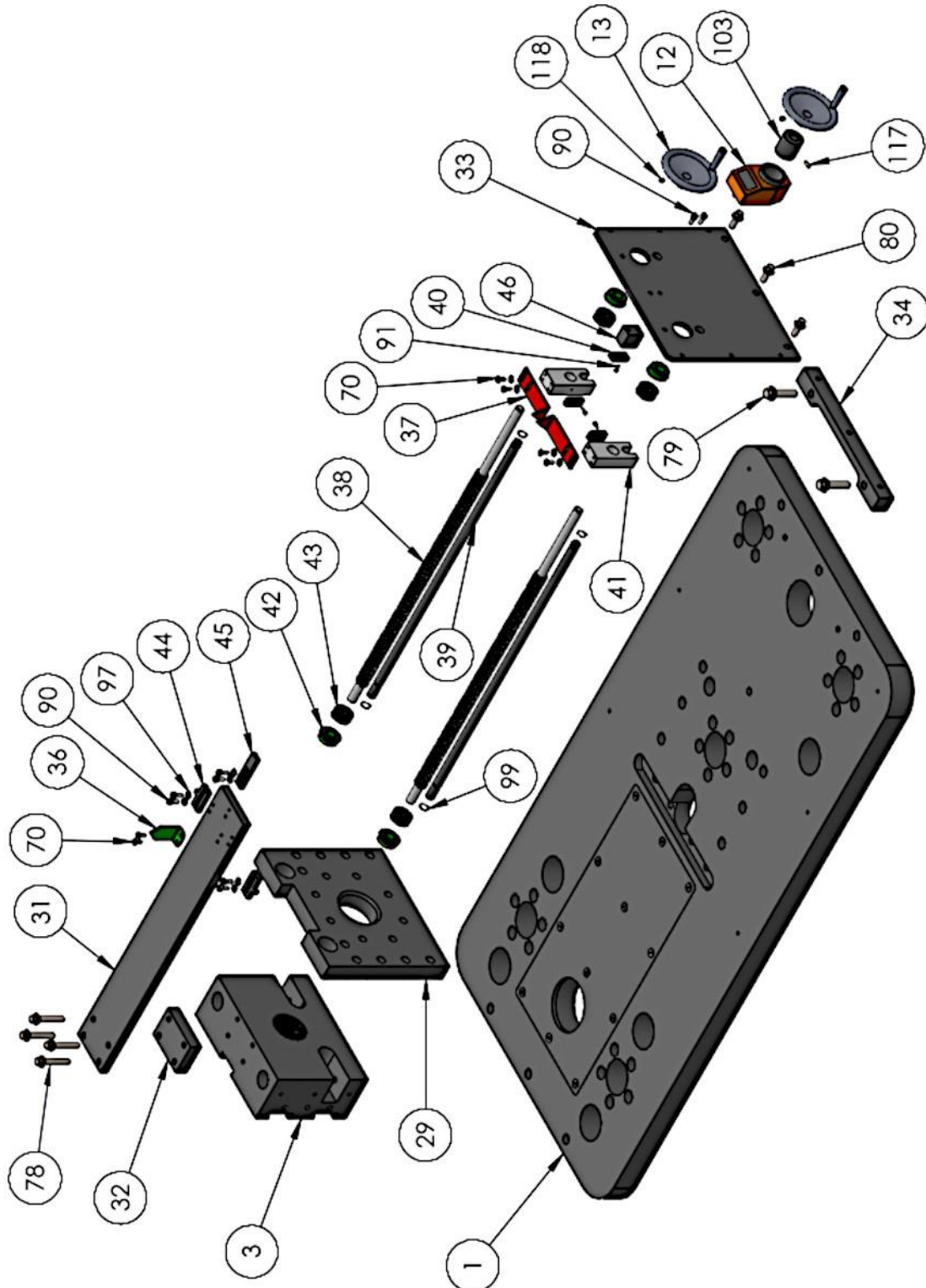
TOP PLATE/CABINET ASSEMBLY PARTS DIAGRAM





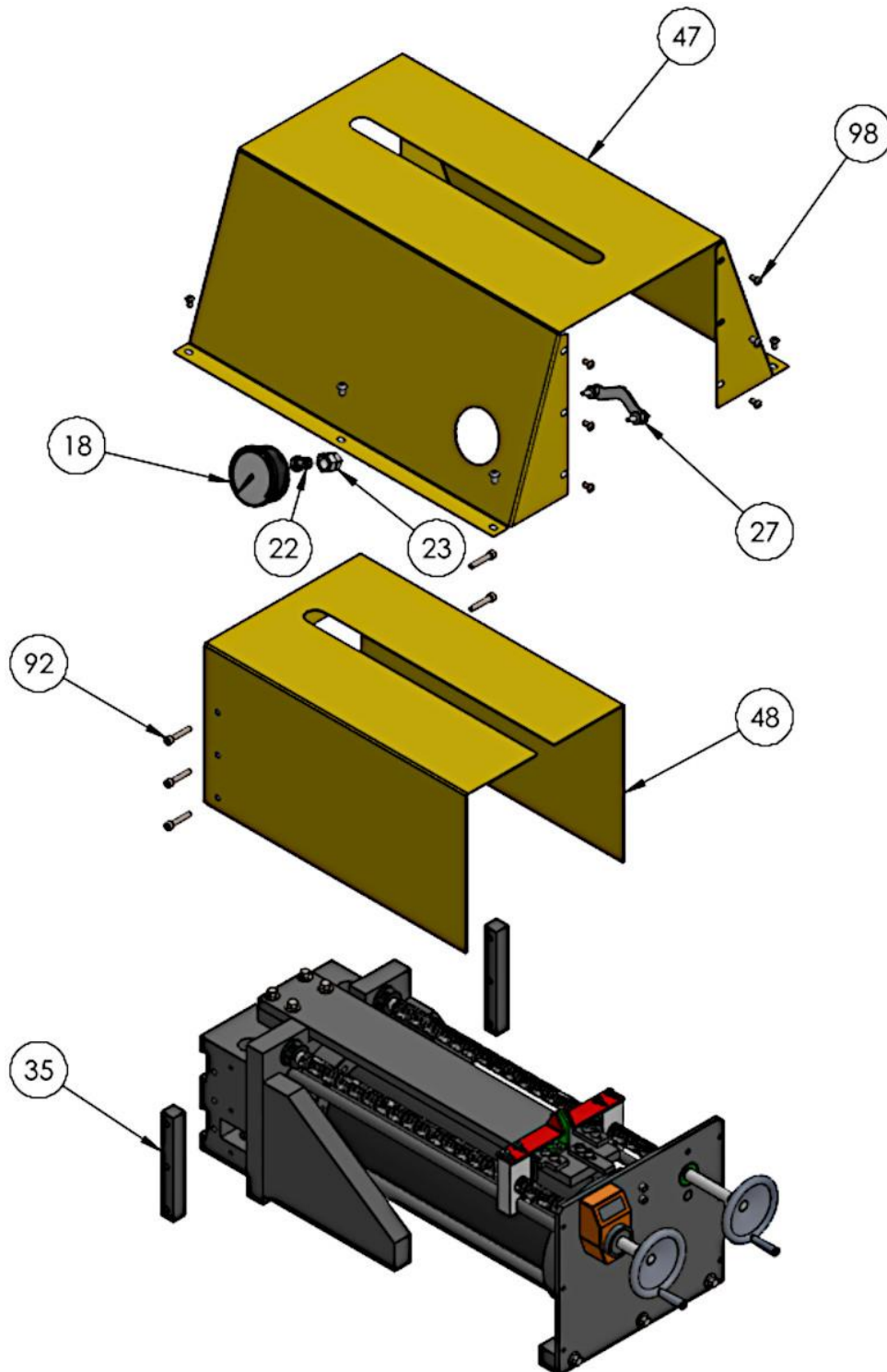


SENSOR ASSEMBLY PARTS DIAGRAM



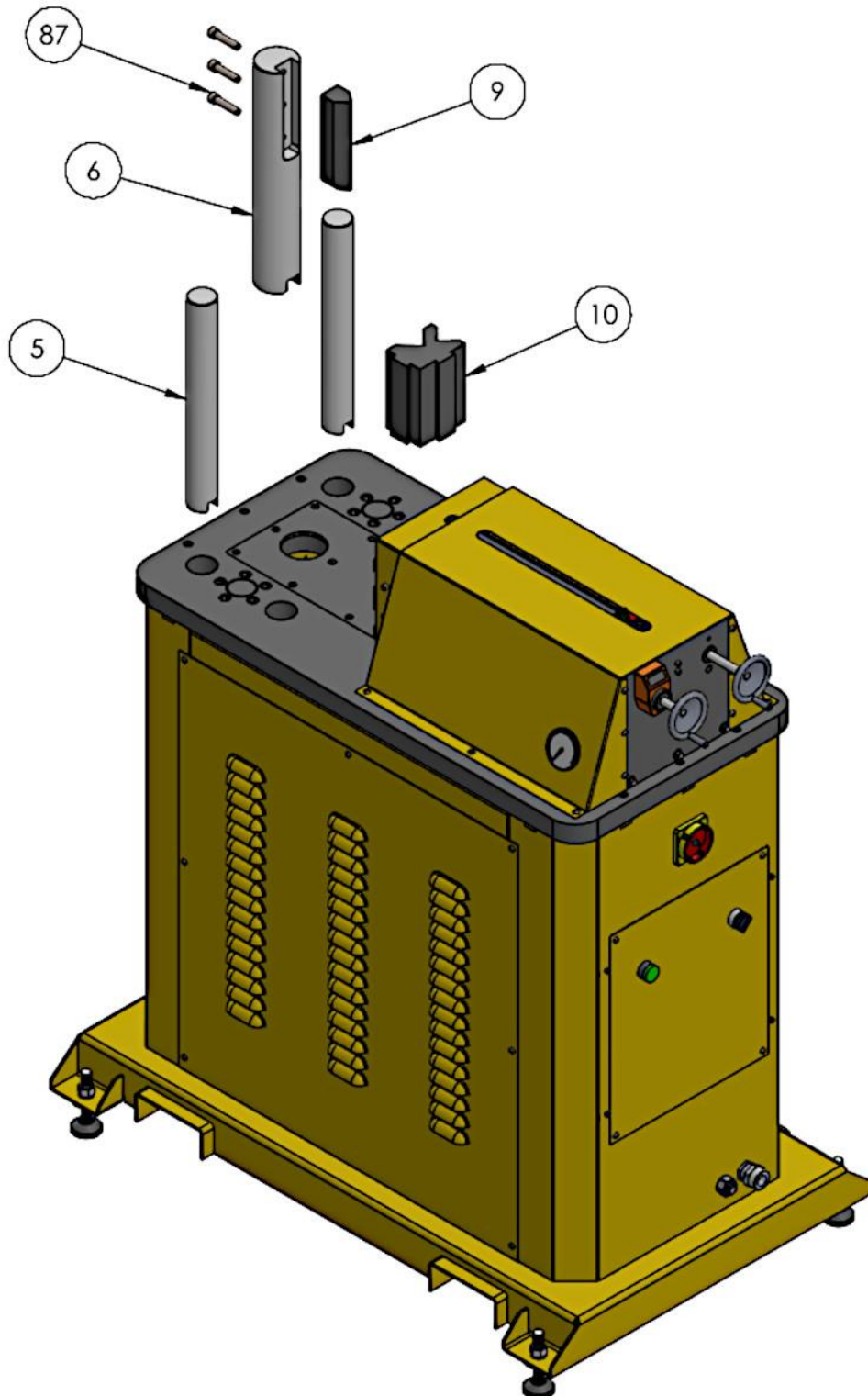


GUARD ASSEMBLY PARTS DIAGRAM



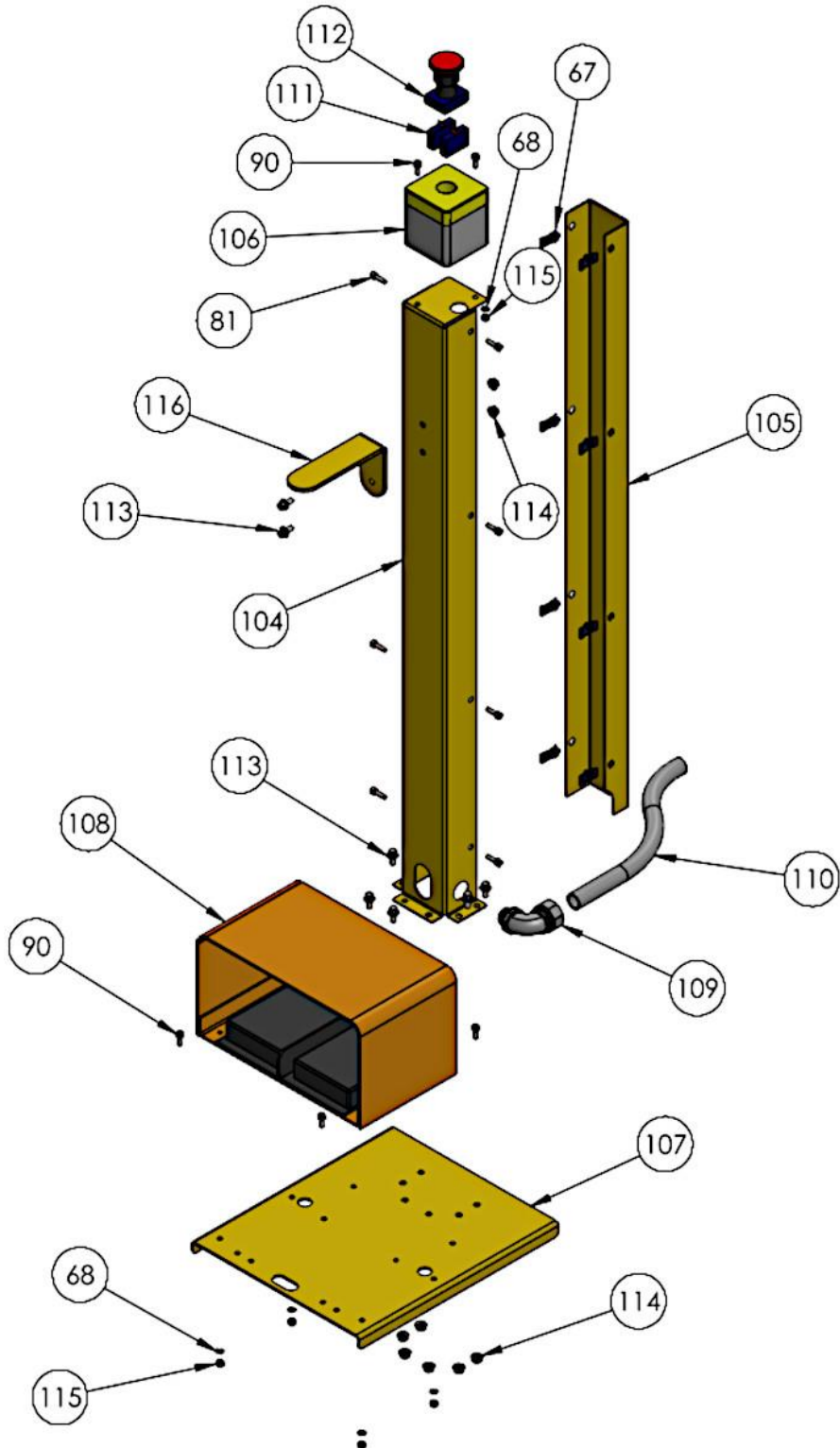


TOOLING ASSEMBLY PARTS DIAGRAM





PENDANT ASSEMBLY PARTS DIAGRAM





Parts List

Item	Part No.	Description	Qty.
1	HP20-6001-V2	MAIN TOP PLATE	1
2	HP20-6004	ANGLE BRACKET	2
3	HP20-6002	MASTER BLOCK	1
4	HP20-6005	BOTTOM PLATE	1
5	HP20-7006	SECONDARY BEND PIN	2
6	HP20-7005	PRIMARY BEND PIN	1
7	HP20-5001	HORIZONTAL PRESS CABINET	1
8	HP20-6009	MASTER KEY	1
9	HPT-40-VEE	BEND NOSE	1
10	HPT-2.0-2.5 DIE	V BLOCK	1
11	HP20-6010	WEAR PLATE	1
12	PP-1272	ELECTRIC COUNTER	1
13	PP-0046	3.0 HAND-WHEEL	2
14	HP20-7012	PLATE SPACER	5
15	HP20-6020	SECONDARY SHAFT KEY	4
16	HP20-6030	ELECTRICAL PANEL	1
17	HP20-7016	WEAR PUCK	2
18	PP-1367	PRESSURE GAUGE	1
19	PP-1424	M500 POWER UNIT	1
20	PP-1269	#6 PLUG	2
21	PP-1134	.125" BRASS ELBOW	1
22	PP-2047	1/4-1/8NPT ADAPTOR	1
23	PP-2045	1/4 NPT FEMALE ELBOW	1
24	PP-1107	FILTER INDICATOR	1
25	PP-0858	-6 STRAIGHT CONNECTOR	2
26	PP-0969	-6 SWIVEL ELBOW	1
27	PP-1367 MOUNT	PRESSURE GAUGE MOUNT	1
28	PP-0784	-6 TO -8 STRAIGHT CONNECTOR	2
29	HP20-6003-V2	THRUST PLATE	1
30	HP20-5003	4.0 BORE X 12.0 STROKE CYLINDER	1
31	HP20-6046	SWITCH SLIDE BAR	1
32	HP20-6047	SPACER BLOCK	1
33	HP20-6048	BEARING PLATE	1



Item	Part No.	Description	Qty.
34	HP20-6052	PLATE SUPPORT	1
35	HP20-6054	GUARD SPACER	2
36	HP20-6055	CENTER POINTER	1
37	HP20-6056	STOP POINTER	2
38	HP20-7018	SENSOR SHAFT	2
39	HP20-7019	GUIDE SHAFT	2
40	PP-2144	PROXIMITY SENSOR	3
41	HP20-6049	SCREW BLOCK	2
42	PP-1385	1/2 LIGHT DUTY BEARING	4
43	PP-0037	1/2" CLAMP COLLAR	4
44	HP20-6060	SWITCH TRIGGER	2
45	HP20-6053	HOME SWITCH ACTUATOR	1
46	HP20-6059	SWITCH BLOCK	1
47	HP20-6057	TOP CYLINDER GUARD	1
48	HP20-6058	CYLINDER GUARD	1
49	PP-1364	SELECTOR SWITCH	1
50	PP-1363	GREEN PUSH BUTTON SWITCH	1
51	PP-0290	CORD GRIP	1
52	PP-0362	MAIN DISCONNECT	1
53	PP-2066	1/2 SEAL TIGHT STRAIGHT	1
54	PP-0750	24" HYD. HOSE	1
55	PP-0752	35" HYD. HOSE	1
56	PP-1414	60" INSTRUMENT HOSE	1
57	PP-0761	24V 15A RELAY	5
58	PP-0029-6	DIN RAIL	2
59	PP-0654	POWER SUPPLY	1
60	PP-0681	OVERLOAD PROTECTOR	1
61	PP-0682	CONTACTOR 5HP	1
62	PP-0924	TERMINAL BLOCK BLUE	3
63	PP-1157	CIRCUIT BREAKER 240V 15A	1
64	PP-1199	5 HOLE GROUND STRIP	1
65	PP-0762	RELAY SOCKET	5
66	PP-0925	TERMINAL BLOCK GREY	10
67	PP-0280	M5 X 0.8 FOLD OVER NUT	12
68	BSM-0197	M5 STAR WASHER	10



Item	Part No.	Description	Qty.
69	BSM-0205	M5 X .8 X 8 PPMS	4
70	BSM-0132	M5 X 0.8 X 10 PPMS	6
71	BS-0323	5/8-11X4 THREADED ROD	4
72	M350-7A071	LEVELING FOOT	4
73	BS-0223	5/8-11 HEX NUT	4
74	BSM-0058	M10 X 1.5 X 20 HX FLG	4
75	BSM-0067	M12 X 1.75 X 30 HEX FLG	25
76	BSM-0068	M12 X 1.75 X 40 HEX FLG	4
77	BSM-0141	M16 X 2.0 X 60 HEX FLG	6
78	BSM-0055	M8 X 1.25 X 45 HX FLG	4
79	BSM-0061	M10 X 1.5 X 40 HX FLG	2
80	BSM-0052	M8 X 1.25 X 20 HX FLG	3
81	BSM-0186	M5 X 0.8 X 16 SHCS	12
82	BSM-0001	M6 X 1.0 X 14 SHCS	2
83	BSM-0008	M8 X 1.25 X 20 SHCS	8
84	BSM-0022	M12 X 1.75 X 25 SHCS	2
85	BSM-0024	M12 X 1.75 X 40 SHCS	25
86	BSM-0012	M8 X 1.25 X 45 SHCS	6
87	BSM-0026	M12 X 1.75 X 50 SHCS	3
88	BSM-0023	M12 X 1.75 X 30 SHCS	8
89	BSM-0016	M10 X 1.5 X 30 SHCS	8
90	BSM-0115	M5 X 0.8 X 12 SHCS	14
91	BSM-0280	M3 X .05 X 8 SHCS	3
92	BSM-0004	M6 X 1.0 X 30 SHCS	6
93	BSM-0018	M10 X 1.5 X 45 SHCS	2
94	BSM-0242	M8 X 1.25 FLG NUT	6
95	BSM-0187	M10 X 1.5 FLG NUT	2
96	BSM-0122	M6 X 1.0 X 16 FHCS	12
97	BSM-0196	M5 FLAT WASHER	10
98	BSM-0103	M6 X 1.0 X 10 BHCS	27
99	BS-0165	.5" EXT. RETAINING RING	4
100	HP20-6026	CABINET COVER	1
101	HP20-6027	MOTOR COVER	1
102	HP20-6037	ELECTRICAL PANEL COVER	1
103	HP20-7021	1/2" COUNTER SLEEVE	1



Item	Part No.	Description	Qty.
104	RP-6010	E-STOP UPRIGHT	1
105	RP-6011	E-STOP UPRIGHT COVER	1
106	PP-2063	E-STOP BOX	1
107	RP-6009	PENDANT BASE	1
108	PP-1143	FOOT PEDAL	1
109	PP-0022	1/2" SEAL TIGHT ELBOW	1
110	PP-2064	1/2 SEAL TIGHT TUBE	1
111	PP-1099 (RED) PP-1220 (GREEN TAB)	CONTACTOR	2
112	PP-1098	EMERGENCY STOP BUTTON	1
113	BSM-0045	M6 X 1.0 X 14 HX FLNG	8
114	BSM-0121	M6 X 1.0 FLANGED NUT	8
115	BSM-0131	M5 X 0.8 NUT	6
116	RP-6014	HANDLE	1
117	BSM-0093	M4 X 0.7 X 12 SET SCREW	1
118	BS-0313	1/4-20 X .25 SET SCREW	2





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