



Operating Instructions and Parts Manual

20 Ton Shop Press

Model HSP-20A



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BA9-1004808
Edition 2 08/2025
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2.0 Safety Instructions

⚠ WARNING

Failure to follow these rules may result in serious personal injury

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 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. 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 bypass or defeat any safety interlock systems.
20. Keep visitors a safe distance from the work area.

⚠ CAUTION

Never connect to an air source capable of exceeding 120 PSI. Over pressurizing the tool may cause bursting, breakage, or serious personal injury.

2.1 Machine Safety Labels



Figure 2-1

Familiarize yourself with the following safety notices used in this manual:

CAUTION

This means that if precautions are not heeded, it may result in minor injury and/or machine damage.

WARNING

This means that if precautions are not heeded, it may result in serious injury or death.

DANGER

This means that if precautions are not heeded, it will result in serious or fatal, injury.

Save the Instructions

3.0 About This Manual

This manual is provided by Baileigh Industrial, covering the safe operation and maintenance procedures for a Baileigh Model HSP-20A 20 Ton Shop Press. This manual contains instructions on installation, safety precautions, general operating procedures, maintenance instructions and parts breakdown. Your machine has been designed and constructed to provide consistent, long-term operation if used in accordance with the instructions as set forth in this document.

Technical Support handles questions on setup, operation, schematics, warranty issues, and individual parts needed. Our Technical Support department can be reached at 920-684-4990.

If there are questions or comments, please contact your local supplier or Baileigh Industrial. We can also be reached at our web site: www.baileigh.com.

Retain this manual for future reference. If the machine transfers ownership, the manual should accompany it.

WARNING

Read and understand the entire contents of this manual before attempting assembly or operation! Failure to comply may cause serious injury!

Register your product online -

<https://baileigh.com/product-registration>



4.0 Product Identification

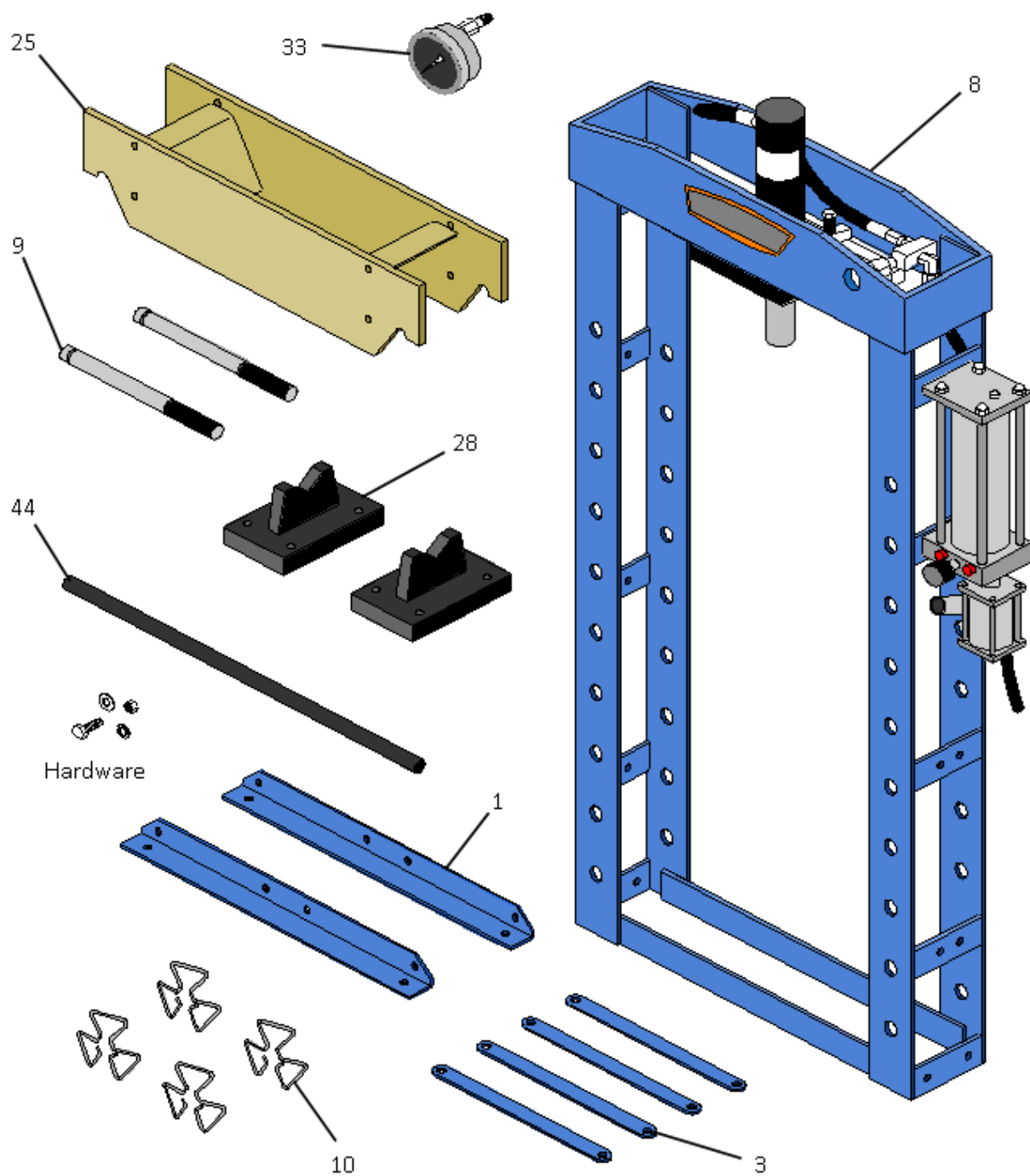


Figure 4-1

Table 4-1

Item	Description	Quantity
1	Base Angles	2
2	Hex Bolt M10 x 25mm	8
3	Brace Supports	4
4	Flat Washer M10	12
5	Lock Washer M10	8
6	Hex Nut M10	8
7	Hex Bolt M12 x 30mm	4
8	Main Frame w/Hydraulics	1
9	Bed Frame Pin	2
10	Circlip	4
25	Bed Frame	1
28	Heel Block	2
29	Flat Washer M12	4
30	Hex Nut M12	4
33	Pressure Gauge	1
34	Lock Washer M12	4
44	Handle	1

4.1 Overall Dimensions

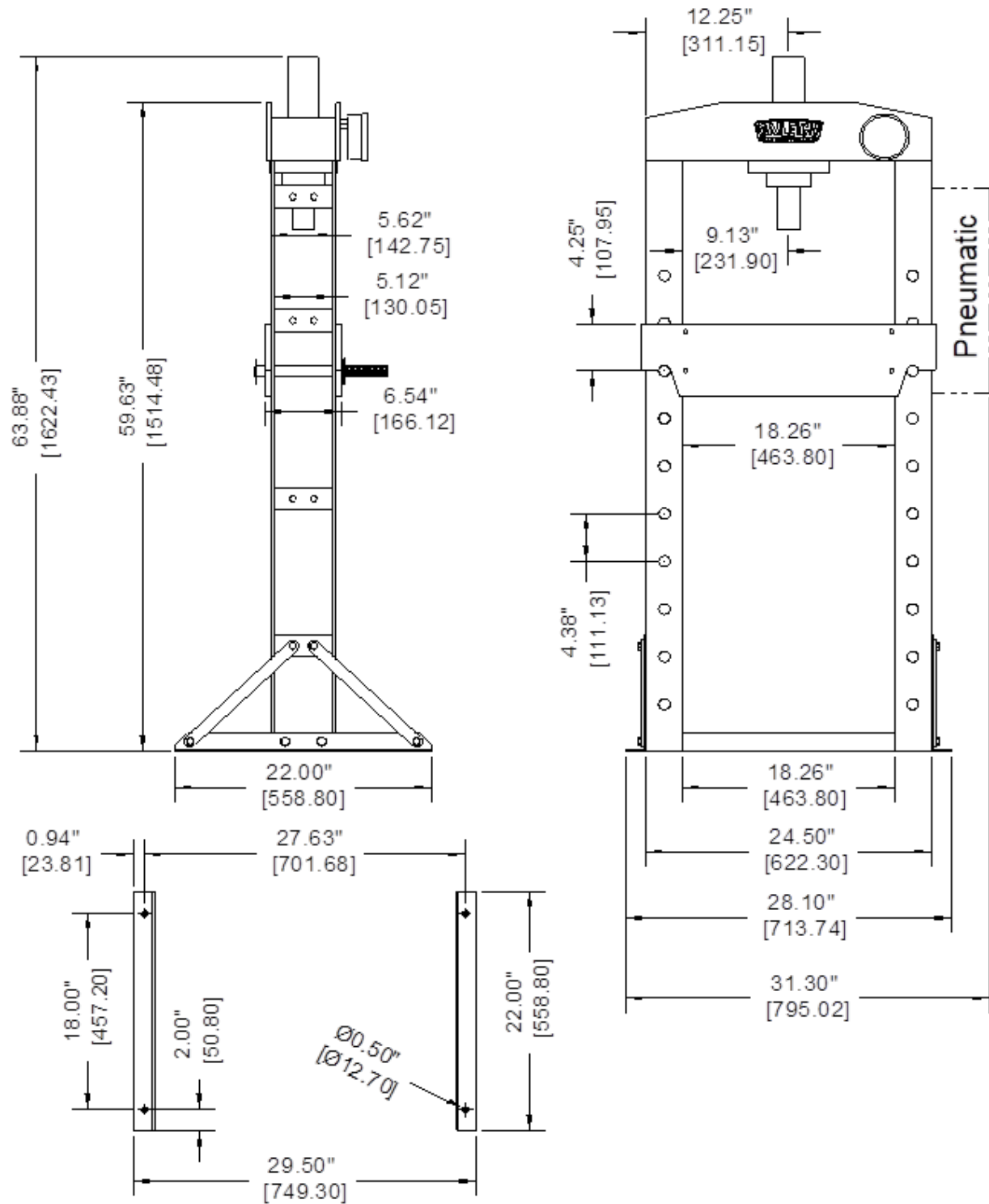


Figure 4-2

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

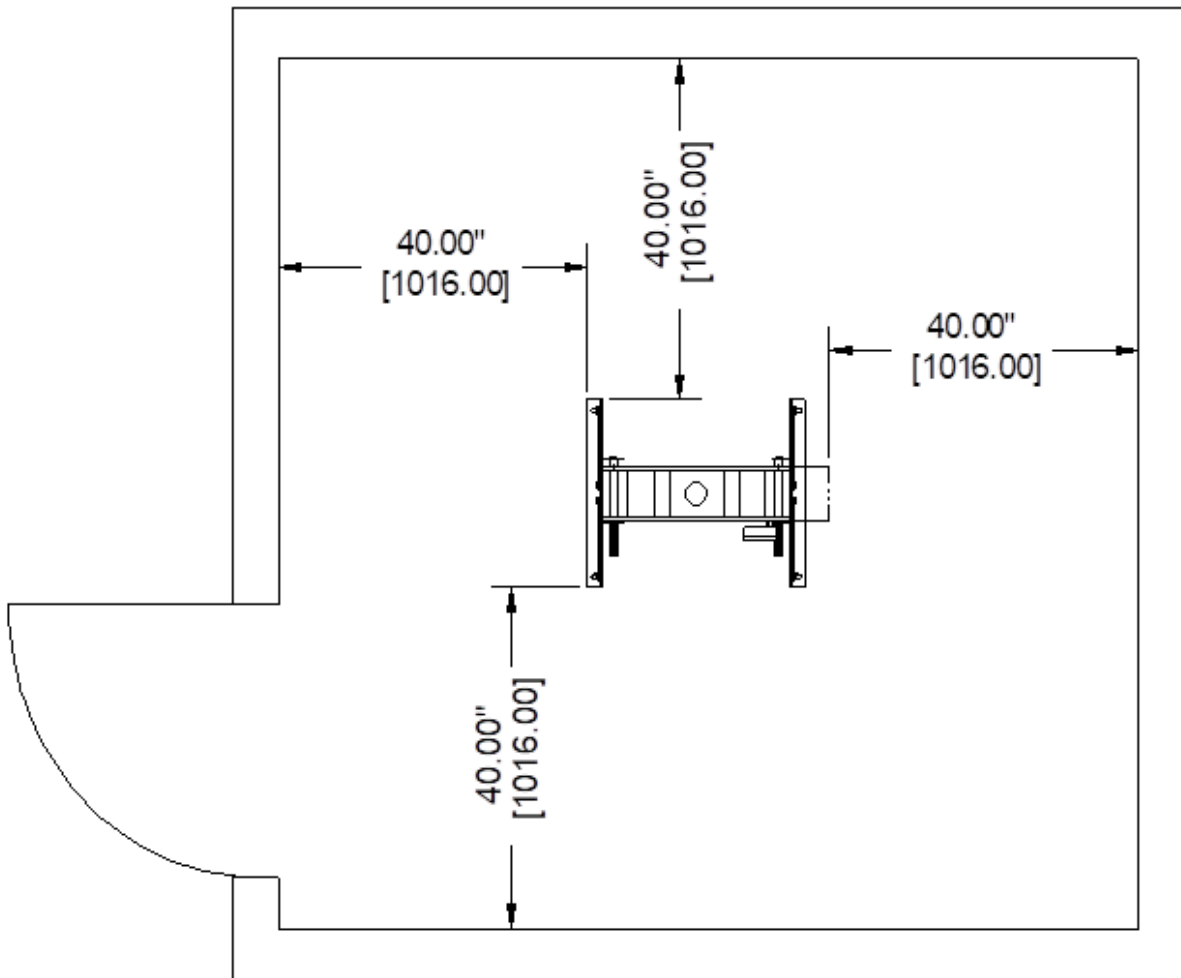


Figure 4-3

5.0 Specifications

Table 5-1

Model Number	HSP-20A
Stock Number	BA9-1004808
Power	
Power Requirement	Pneumatic/Manual
General Specifications	
Maximum Capacity	20 ton (18 ton)
Hydraulic System Pressure	10060psi. (69.36MPa)
Moveable Cylinder	Yes
Working Width	19.25" (489mm)
Cylinder Stroke	7.5" (190mm)
Cylinder Diameter	3" (76.2mm)
Piston Rod Diameter	1-1/2" (38mm)
Piston Head Diameter	2" (50.8mm)
Working Range	2.125" ~ 41.1" (54 ~ 1044mm)
Air Fitting	1/4"NPT
Air Pressure	107 ~ 124psi. (.75 ~ .85MPa)
Weights and Dimensions	
Shipping Weight	319 lbs (145kgs)
Shipping Dimensions	66" x 29" x 12" (1677 x 737 x 305mm)

! WARNING

Read and understand the entire contents of this manual before attempting assembly or operation. Failure to comply may cause serious injury.

6.0 Setup and Assembly

6.1 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.

! WARNING

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

6.2 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.

6.3 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 fork lift with sufficient lifting capacity and long enough forks to reach the complete width of the load.
- 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.

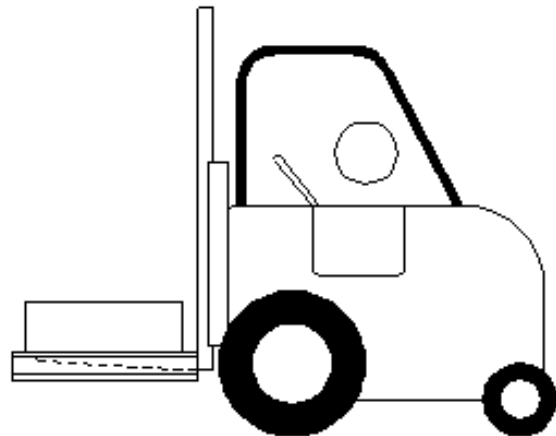


Figure 6-1

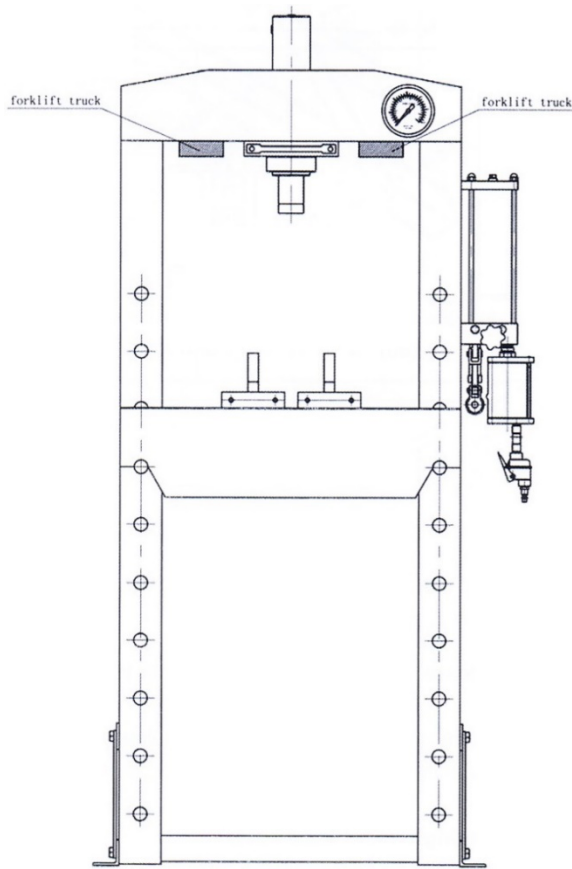


Figure 6-2

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.

6.4 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.
- **AIR SUPPLY PLACEMENT:** The air supply should be located close enough to the machine so that the air line is not in an area where it would cause a tripping hazard.

6.4.1 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.

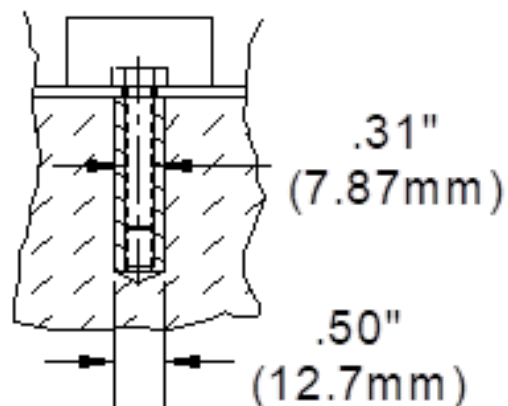


Figure 6-3

! WARNING

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

6.4.2 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. 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.

6.5 Assembly

6.5.1 Mounting Support Structure

While the base (8) is lying on its side, slide the bed frame (25) from the bottom of the base. This provides for better access when attaching the support structure.

1. Attach the base section angle (1) to the base (8) with two M12 x 30mm hex bolts (7), flat washers (29), lock washers (34), and nuts (30). Add the two supports (3) with four M10 x 25mm hex bolts (2), flat washers (4), lock washers (5), and nuts (6). Repeat for the opposite side of the base. (Tighten all nuts and bolts securely.)

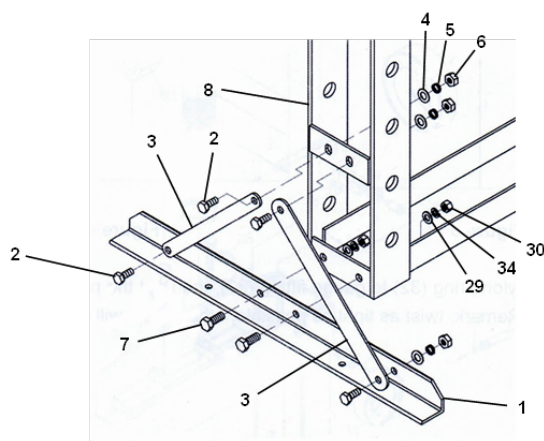


Figure 6-4

2. Slide the bed frame (25) back down to the bottom of the base before standing the press up. Now using suitable lifting equipment, safely lift the press to a vertical position. Make sure the pneumatic cylinder assembly is supported and not hanging by the hoses which could damage them.

6.5.2 Hanging the Cylinder Assembly

3. Move the cylinder assembly (41) to the outside of the base frame (8) as shown in (fig. 6) and attach to the frame members using four M10 x 25mm hex bolts (37) and flat washers (4). Tighten securely.

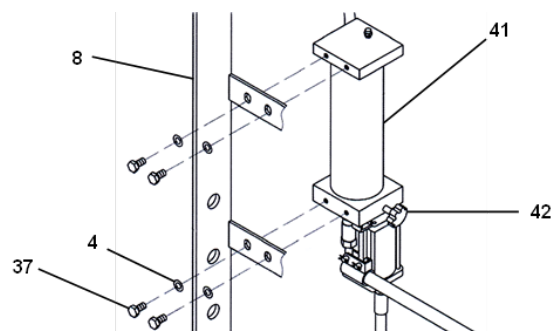


Figure 6-5

6.5.3 Attaching the Pressure Gauge

4. Turn valve (42) counterclockwise (ccw) to relieve any pressure in the system. Remove plug (45) and "O" ring (32). Apply thread sealant to the fitting (31) on the pressure gauge. Re-insert the "O" ring (32) and thread the union nut (26) onto the gauge fitting (31). Tighten and check for leakage.

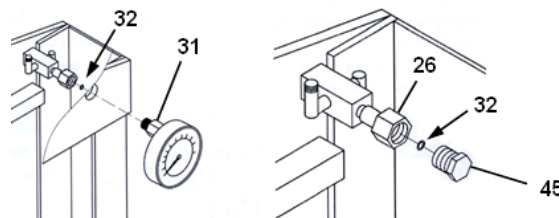


Figure 6-6

6.5.4 Attaching Hydraulic Lines

5. Turn valve (50) counterclockwise (ccw) to relieve any pressure in the system.
6. Remove and discard the plugs (A) from the end of the pressure hose and from the elbow fitting.
7. Connect the pressure hose to the fitting and tighten.
8. Remove the compression fitting (B) from the top of the reservoir.
9. Remove and discard the plugs from the compression fitting and from the end of the tube (C).
10. Slide the compression fitting nut over the tube and then install the tube onto the compression fitting bayonet.
11. Firmly tighten the compression nut onto the fitting without causing damage to the tube or the fitting.

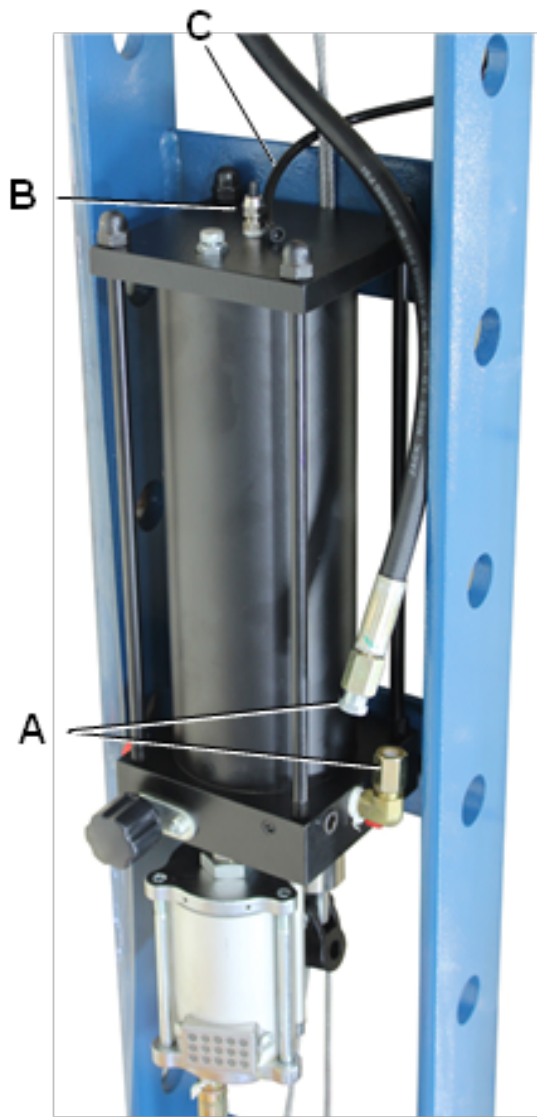


Figure 6-7

7.0 Adjustments

7.1 Before Operating

1. Securely fasten the Baileigh HSP-20A hydraulic press to a level concrete floor.
2. Make sure there is adequate lighting and a 40" (1,016mm) minimum clearance around the entire machine.
3. Before using for the first time, pour a teaspoon of good quality air tool lubricant into the air supply inlet of the lift control valve. Connect a 120 psi (.83Mpa) airline to the control valve and press the handle for 3 seconds to evenly distribute the lubricant.
4. To purge air from the manual system, open the release valve (42) by turning it counterclockwise (ccw) a couple turns. Pump the manual handle several full strokes to eliminate any air in the system. Turn the release valve (42) clockwise (cw) to close.

5. To purge air from the compressed air system, open the release valve (42) by turning it counterclockwise (ccw) a couple turns. Connect your airline to the fitting (46) on the lift control valve. Press the valve handle and let the pump work several times to eliminate any air in the system. Turn the release valve (42) clockwise (cw) to close.



Figure 7-1

7.2 Ram Slide Adjustment

To move the ram slide laterally:

1. Loosen the four spring loaded hex bolts.
2. Slide the assembly to a new location.
3. Re-slug the spring loaded hex bolts enough to secure the ram slide.



Figure 7-2

8.0 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.

1. Provide a container or applicable padding under the press to protect the part when it drops.
2. Position the heel plates to support the workpiece, and align the press pin or tooling on the part to be pressed.
3. Preload the workpiece prior to proceeding with the full pressing operation.
4. View the setup from various angles, and verify that the ram remains aligned with and centered with the workpiece and the bed.
5. Release the hydraulic pressure and allow 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.

⚠ WARNING

Never compress springs or objects that when compressed, could shatter, or explode out of the press causing serious injury.

8.1 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.

9.0 Operation

⚠ CAUTION

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

⚠ CAUTION

Never lift or lower the bed with tooling or material or pressure from the ram on the bed. This will damage the machine voiding the warranty.

1. Select a set of holes where you want to position the bed frame.
2. Have an assistant raise the frame to a point slightly higher than the holes so that the two bed frame pins (9) can be inserted into the holes.
3. Secure the four wire clips (10) to the pins and then lower the frame so it rests squarely on the pins.
4. Place the two heel blocks (28) on the frame. They can be used with the flat side up or the V-block side up. Always push the pins down.

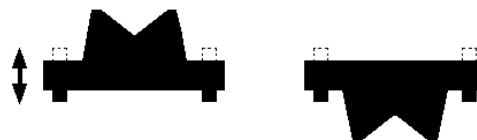


Figure 9-1

Note: The heel blocks should always be used as a pair, not individually.

9.1 Sequence of Operation

1. Insert the piece part into the V-blocks or onto the flat blocks.
2. Close the release valve (42) by turning it clockwise (cw) until it is off.
3. Connect the quick air valve (46) to a 120 psi. (.83 MPa) air source.
4. Press the lever on the air valve (46) to let the pump work until the serrated saddle (11) nears the piece part, then turn off the valve. (When an air source is unavailable, pump the handle (44) until the serrated saddle nears the piece part.)
5. Align the piece part to the ram to ensure center loading.

WARNING

Failure to center the piece part on the blocks and the ram to the piece part may cause serious injury.

WARNING

Never compress springs or objects that when compressed, could shatter, or explode out of the press causing serious injury.

6. Press the lever on the air valve (46) or pump the handle (44) to apply load to the piece part. Applied pressure is read on the pressure gauge (33).
7. When the work is done, release the lever on the air valve, or stop pumping on the handle.
8. Slowly and carefully remove the load from the piece part by turning the release valve (42) counterclockwise (ccw) in small increments until the ram backs away from the piece part.
9. Once the ram has fully retracted, remove the piece part from the bed frame.
10. Disconnect the air valve (46) from the air source.

9.2 Oil Pressure to Ram Press Force Chart

Table 9-1

Oil Pressure (Mpa)	Ram Force (Ton)
17.33	5
34.67	10
52.01	15
69.35	20
86.69	25

10.0 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.

11.0 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.

12.0 Maintenance

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

12.1 Daily Maintenance

- Check daily for any unsafe conditions and fix immediately.
- 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. See Purging the Hydraulic System.

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

12.2 Checking the Hydraulic Oil

1. Remove the oil filler nut (48) on top of the reservoir.
2. If oil is low, refill with 22 ISO6743 hydraulic jack oil or equivalent.
3. Replace the oil fill nut (48).
4. Purge air from the hydraulic system.

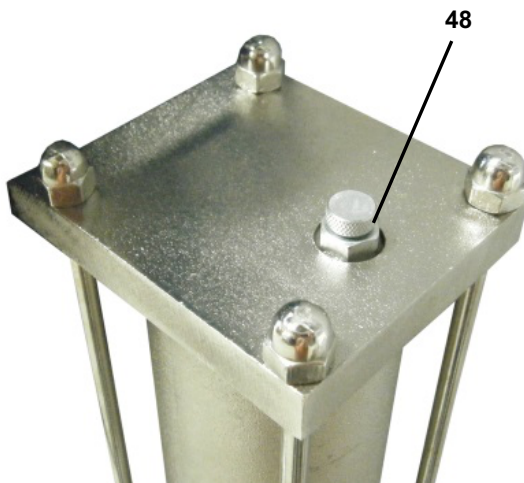


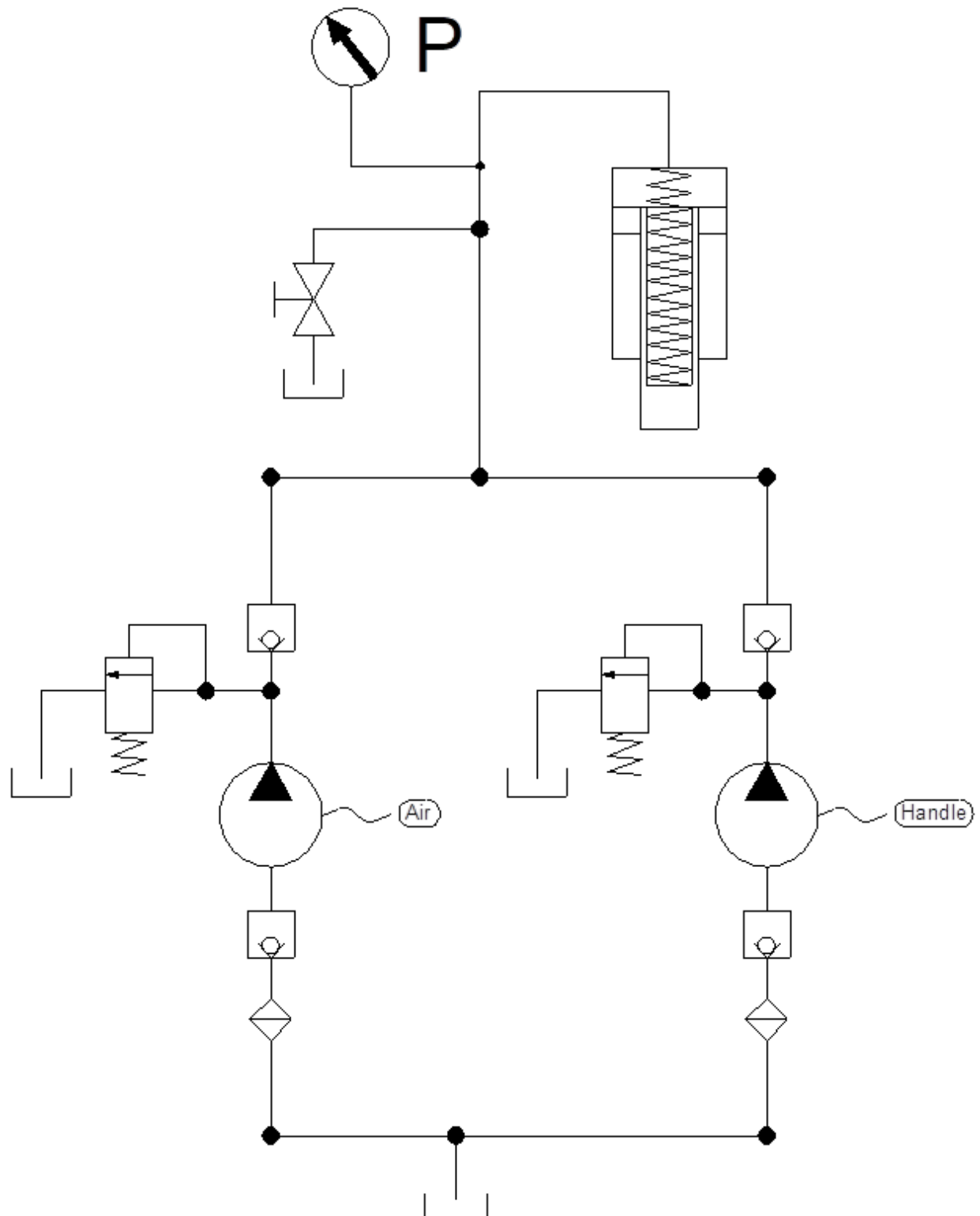
Figure 12-1

13.0 Troubleshooting

Table 13-1

Symptom	Possible Cause (S)	Corrective Action
Pump is Working But The Ram Will Not Move.	The oil pipe is loose.	Tighten pipe connections.
	The ram is leaking.	Replace the oil seals.
When Release Valve is Opened, Ram Does Not Reset.	The oil pipe is loose.	Tighten pipe connections.
	Not enough space in the pump.	Open the exhaust valve.
	Ram is damaged.	Replace the ram.
Sound From Air Motor But Ram Does Not Work.	Release valve not completely closed.	Check and close the release valve.
	Air in system.	Purge the system.
Ram Can Not Complete Stroke.	Not enough hydraulic oil.	Add sufficient oil.
Air Motor Does Not Work.	Not enough air pressure or exceeded the capacity.	Check the air pressure and capacity.
	Air motor is damaged.	Replace the air motor. Contact Baileigh Industrial at 920.684.4990.
Leaking oil	Damaged or worn out cylinder seals.	Replace the seals.
	Screwed parts loose.	Re-tighten screws.
	Damaged hose or hoses.	Contact Baileigh Industrial at 920.684.4990.

14.0 Hydraulic Schematic



15.1.1 20 Ton Shop Press Assembly - Exploded View

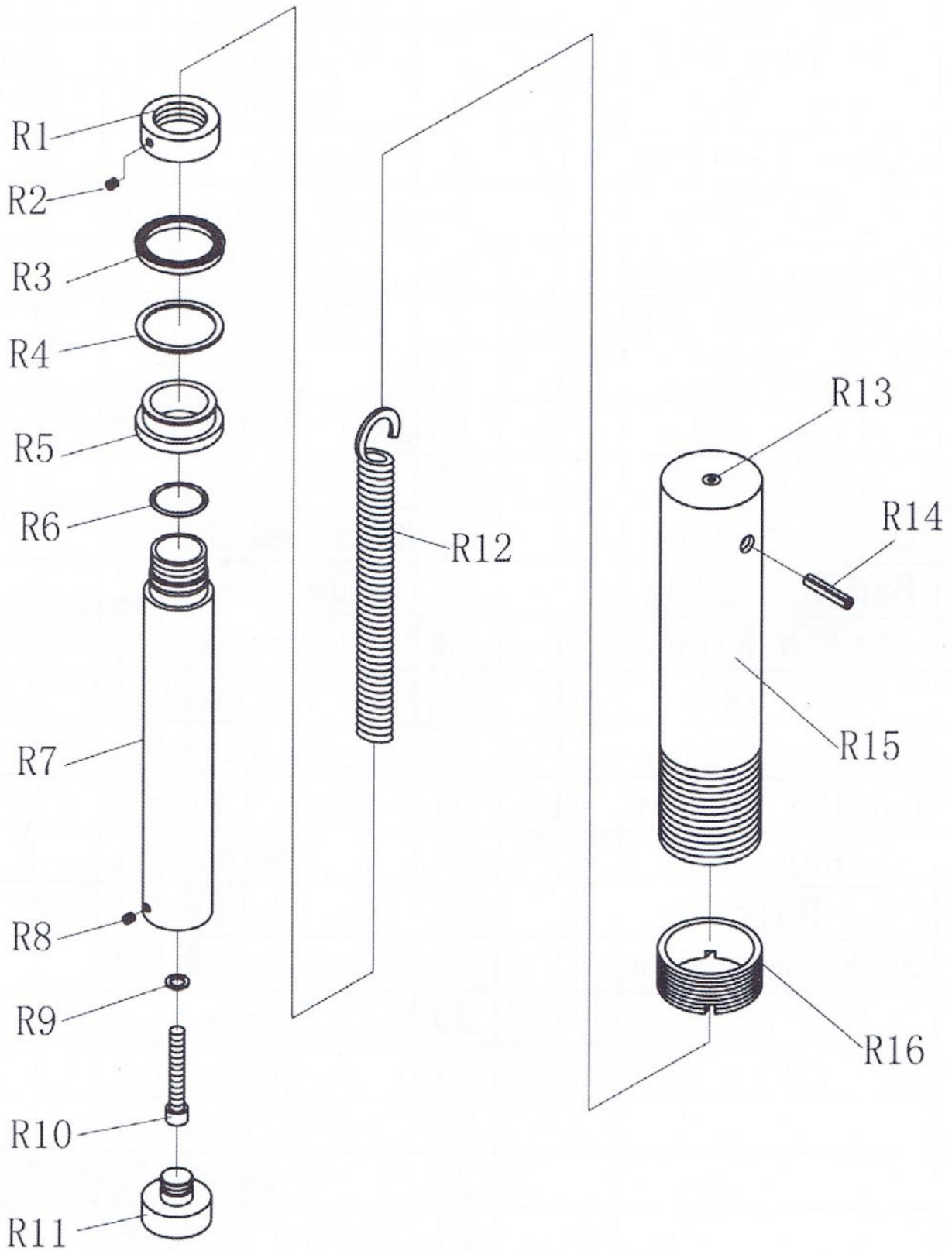
This technical drawing shows an exploded perspective view of a mechanical testing machine. The main frame consists of two vertical columns (8) connected by a base (1) and a top cross-member (25). A central vertical rod (21) is shown with various components including a coil (20), a ring (19), and a piston (18). A pressure gauge (33) is mounted on the side. A hydraulic cylinder (42) is connected to a pump (46) via a hose (44). Various bolts, nuts, and pins are labeled with numbers 1 through 48. The diagram illustrates the assembly of the machine, showing how the various parts fit together.

15.1.2 20 Ton Shop Press Assembly - Part list

Index No.	Part No.	Description	Size	Qty.
1	**	Base Section		2
2	**	Hex Cap Screw	M12x25	8
3	BA9-1012734	Support		4
4	**	Flat Washer	M12	12
5	**	Lock Washer	M12	8
6	**	Hex Nut	M12P1.75	8
7	**	Hex Bolt	M12x25	4
8	BA9-1022464	Base		1
9	BA9-1012735	Bed Frame Pin		2
10	BA9-1016252	Circlip		4
11	BA9-1008459	Serrated Saddle		1
12	BA9-1016253	Cylinder Nut		1
13	BA9-1016254	Lower Plate		1
17	BA9-1016255	Spring		4
18	**	Hex Cap Screw	M10X100	
19	BA9-1016257	Upper Ring		1
20	**	Socket Set Screw, Cone Point	M6x6	5
21	BA9-1004809	Ram		1
22	BA9-1016259	Oil Hose	500mm	
23	BA9-1016260	O-Ring	OR-5.2x1.9	3
24	BA9-1021923	Banjo Fitting		1
25	BA9-1016261	Bed Frame		1
26	BA9-1016262	Union Nut		1
27	BA9-1016263	Banjo Fitting		1
28	BA9-1012736	Heel Block		2
29	**	Flat Washer	M12	4
30	**	Hex Nut	M12P1.75	4
31	BA9-1016264	Gauge Fitting		4
32	BA9-1016265	Nylon Ring		1
33	BA9-1009469	Pressure Gauge		1
34	**	Lock Washer	M12	5
35	**	Hex Cap Screw	M12x25	1
36	BA9-1016268	Link Rod		2
37	**	Hex Cap Screw	M10x20	4
38	BA9-1016269	Banjo Fitting		1
39	BA9-1016270	Banjo Fitting		1
40	BA9-1016271	Nylon Ring		1
41	BA9-1016272	Pump Assembly		1
42	BA9-1016273	Release Valve		1
42A	BA9-1020016	Release Valve U-Clamp (not shown)		1
43	BA9-1016274	Handle Socket		1
44	BA9-1009004	Handle		1
45	BA9-1016275	Plug (not shown)		1
46	**	Quick Coupler-Male		1
47	BA9-1016276	Oil Hose	750mm	1
	BA9-1230510	Complete Piston Assembly (not shown)		1
48	BA9-1016277	Oil Filler Nut		1

** These parts are shown for reference only and are not available for order individually. Non-proprietary parts, such as fasteners, can usually be found at local hardware stores.

15.1.3 Main Cylinder Assembly – Exploded View



15.1.4 Main Cylinder Assembly – Part list

Index No.	Part No.	Description	Size	Qty.
R1.....	BA1-4141	Nut.....		1
R2.....	BA1-4142	Socket Set Screw, Cone Point	M6×6.....	1
R3.....	BA1-4143	Sealing Ring	YF-50×60×6	1
R4.....	BA1-4144	Ring		1
R5.....	BA1-4145	Bushing.....		1
R6.....	BA9-1021073	O-Ring	OR-33.8×3.1	1
R7.....	BA9-1021072	Ram		1
R8.....	BA1-4146	Socket Set Screw, Flat Point	M6×8.....	1
R9.....	BA1-4147	Sealing Washer		1
R10.....	BA1-4148	Socket Head Cap Screw	M10×70.....	1
R11.....	**	Serrated Saddle.....		1
R12.....	BA9-1009767	Spring		1
R13.....	BA1-4149	Internal Drive Pipe Plugs - Conical Thread	1/4-NPT	1
R14.....	BA1-4150	Pin		1
R15.....	BA1-4151	Cylinder		1
	BA9-1004814	Seal Kit for press (not shown)		1
R16.....	BA1-4152	Ring for Ram		1
A8.....	BA9-1010089	Compression Spring-Air Motor (not shown)		1
A8-C	BA9-1015204	Compression Spring-New Air Motor (not shown)		1
P4.....	BA9-1230504	Piston (not shown).....		1
P5.....	BA9-1230505	O-Ring (not shown)	OR-6.5×3	1
P6.....	BA9-1230506	Nylon Ring (not shown)		1
P7.....	BA9-1230507	Dust Seal (not shown)		1
P8.....	BA9-1230508	Small Ram (not shown)		1
P9.....	BA9-1230509	Copper Washer (not shown).....		2

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