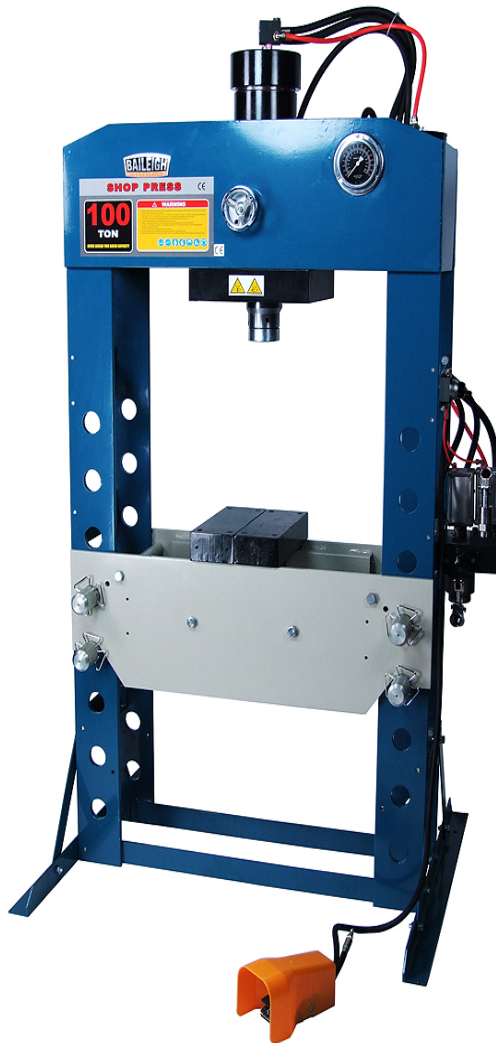




Operating Instructions and Parts Manual

100 Ton Shop Press

Model HSP-100A



Baileigh Industrial
P.O. Box 531
Manitowoc, WI 54221-0531
Ph.: 920-684-4990
Fax: 920-684-3944
Baileigh-Sales@jpwindustries.com

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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 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 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



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-100A 100 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 Specifications

Table 4-1

Model Number	HSP-100A
Stoc Number	BA9-1004759
General Specifications	
Maximum Capacity	100 ton (89 ton)
Hydraulic System Pressure	9237psi. (63.69MPa)
Moveable Cylinder	Yes
Working Width	31" (787mm)
Cylinder Stroke	11.8" (300mm)
Cylinder Diameter	6.5" (165mm)
Piston Rod Diameter	4" (101mm)
Piston Head Diameter	3.5" (89mm)
Working Range	3.6" ~ 36.7" (93 ~ 933mm)
Power Requirement	Pneumatic/Manual
Air Fitting	¼"NPT
Air Pressure	107 ~ 200psi. (.75 ~ 1.38MPa)
Weights and Dimensions	
Shipping Weight	1705lbs (775kgs)
Shipping Dimensions	81" x 45" x 21" (2058 x 1143 x 534mm)

⚠ WARNING

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

5.0 Setup and Assembly

5.1 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.

5.2 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.

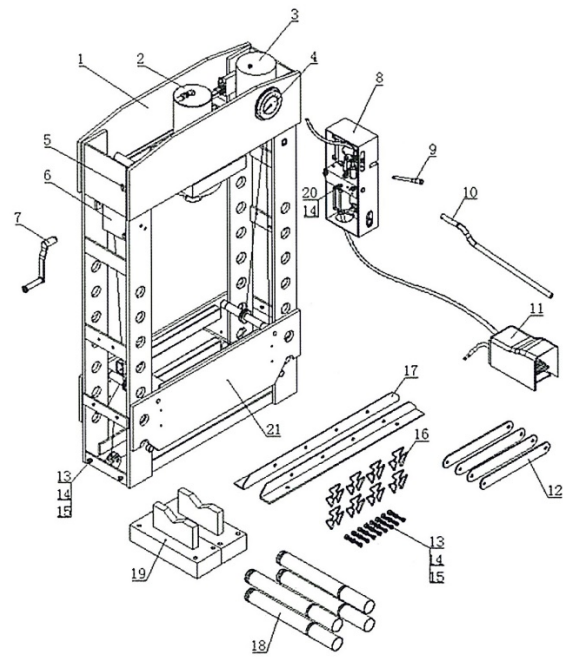


Figure 5-1

Table 5-1

No.	Description	Qty.	Remark
1	Body Frame	1	
2	Ram Assembly.	1	Assembled in frame
3	Oil Tanks Assembly.	1	Assembled in frame
4	Pressure Gauge	1	Assembled in frame
5	Ram Moving Equipment	1	Assembled in frame
6	Working Bed Lifting Equipment	1	Assembled in frame
7	Handel	1	
8	Pump Assembly	1	
9	Handel Lever For Select Valve	1	
10	Handel Tube	1	
11	Air Foot Valve	1	Assembled in the pump assembly
12	Support	4	
13	Hex Bolt M12 x 30	12	8pcs in the hardware kit, 4pcs installed in frame
14	Spring Washer M12	15	8pcs in the hardware kit 4pcs installed in frame 3pcs installed in the pump assembly

No.	Description	Qty.	Remark
15	Washer M12	12	8pcs in the hardware kit, 4pcs installed in frame
16	Circlip	8	In the hardware kit
17	Base	2	
18	Pin	4	
19	Heel Block	2	
20	Hex Bolt M12 x 25	3	Installed in the pump assembly
21	Working Bed	1	Assembled in frame

5.3 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.

Choose a location that will keep the machine free from vibration and dust from other machinery.

Keep in mind that having a large clearance area around the machine is important for safe and efficient working conditions.

Follow these guidelines when lifting:

- 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.

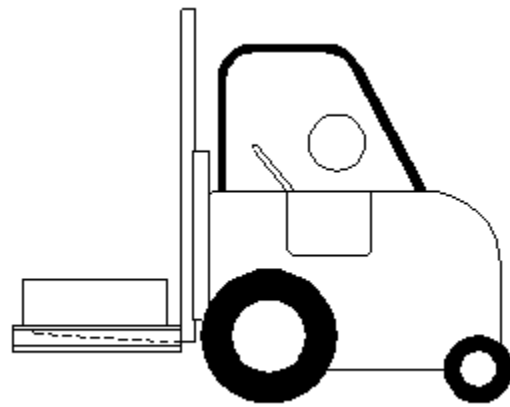


Figure 5-2

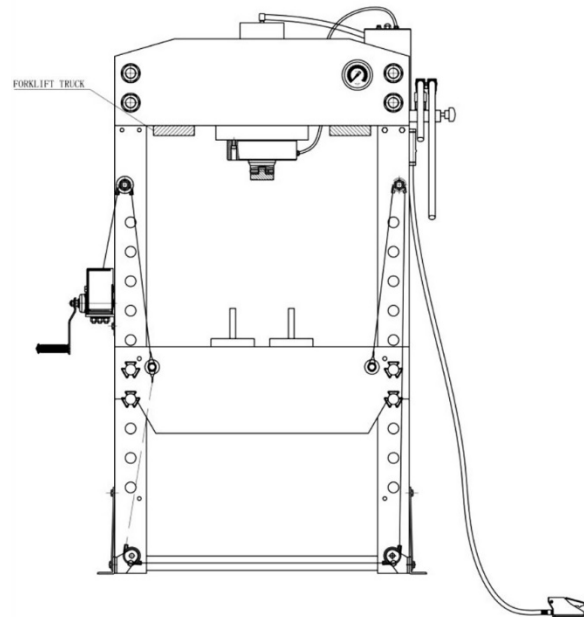


Figure 5-3

5.4 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.

5.4.1 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.

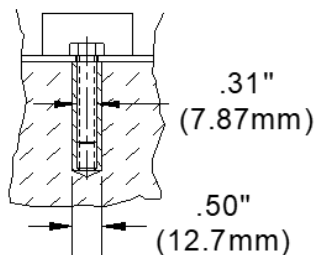


Figure 5-4

⚠ 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.

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

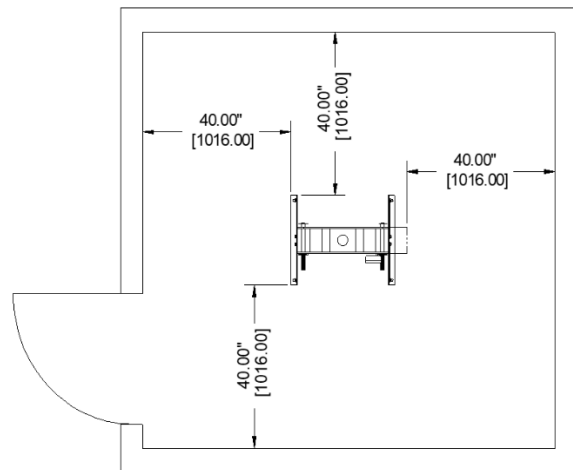


Figure 5-5

5.4.2 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.

5.5 Assembly

Note: Reference the Parts Diagram near the end of the book for additional component identification and location.

5.5.1 Base

1. Disassemble the hex bolt M12*30 (30), washer M12 (27), spring washer M12 (31), hex nut M12 (32) from part A of the press frame body. Then assemble the base to the body frame by the above parts.

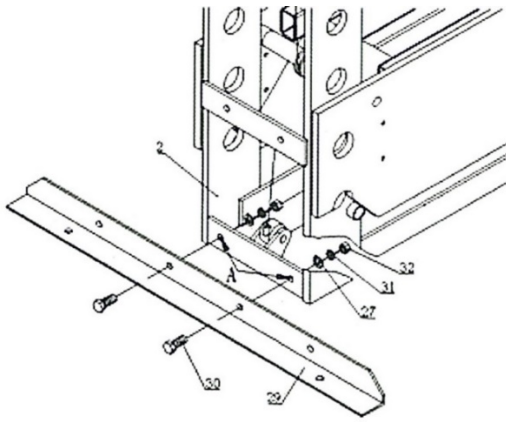


Figure 5-6

2. Fix the 4pcs supports (34) to the body frame part B and C by using hex bolt M12 x 30 (30), washer 12 (27), spring washer 12 (31) and hex nut M12 (32).

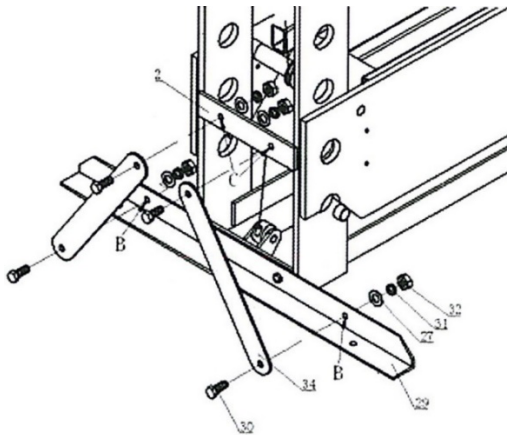


Figure 5-7

Pump Assembly

1. Fix the pump assembly. (80) to the body frame by using hex bolt M12 x 25 (33) and spring washer M12 (31).

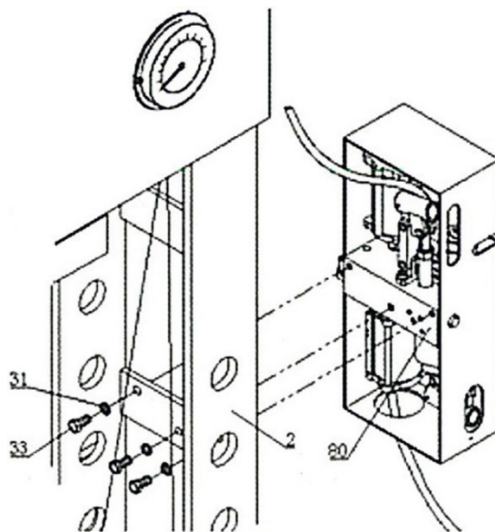


Figure 5-8

2. To avoid oil spillage from the oil hose (88), a plug (93) has been added in the oil hose when packing. To remove the plug, cut the oil hose with the plug about 10mm length.

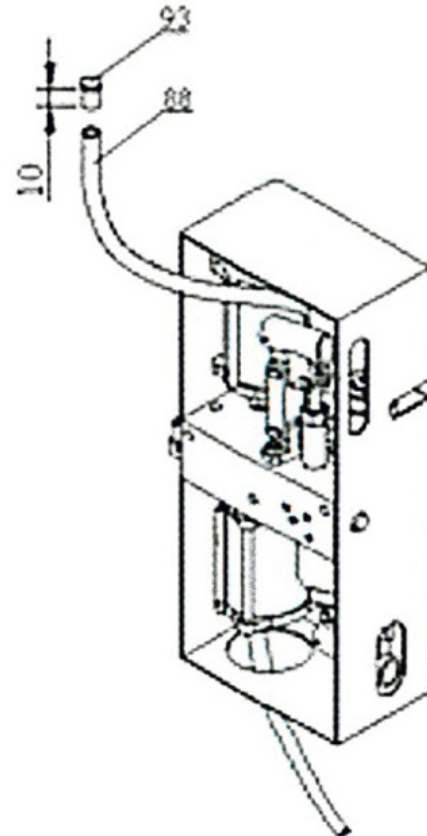


Figure 5-9

3. Then connect the oil hose (88) to 1/2" connector (94). Once the oil supply hose is connected, open the oil tank valve to allow the flow of oil and check for leaks.

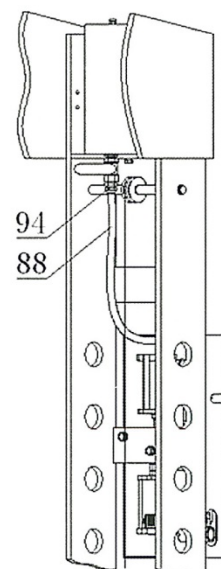


Figure 5-10

4. Remove the plug of connector (97, 98) and oil hose (78, 79), then connect the oil hose 1 (78) and oil hose 2 (79) to connector (98) and connector (99) and tighten it.

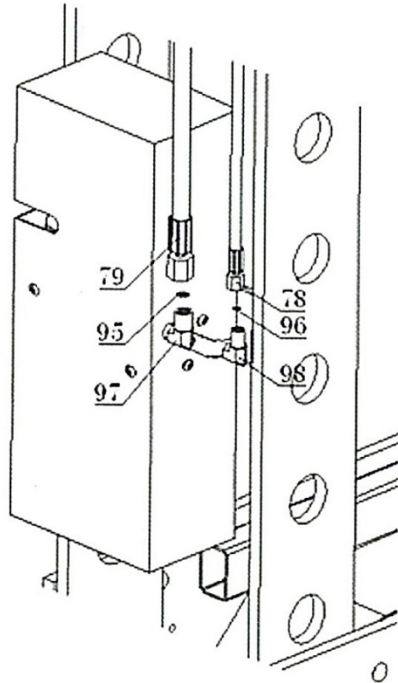


Figure 5-11

Note: Make sure the O-rings are in the grooves of connector (97) & (98) before assembling the two oil hoses.

5. Fix the selector lever (99) on the selector valve on the pump (80).

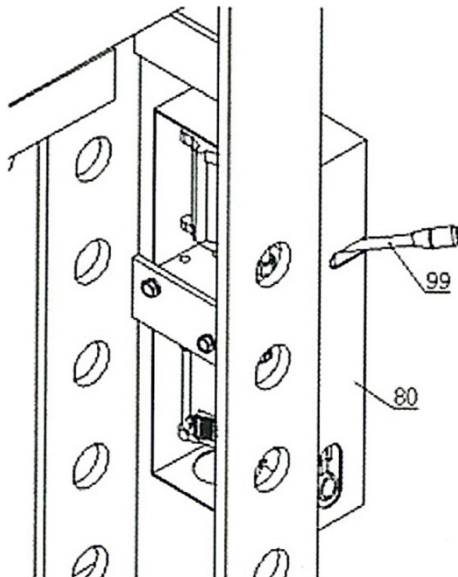


Figure 5-12

5.5.2 Ram Moving

1. Insert the handle (12) to the worm connecting shaft (M1)

2. Turning the handle clockwise, and the ram moves left (Direction A).
3. Turning the handle (12) counterclockwise, and the ram moves right (Direction B)

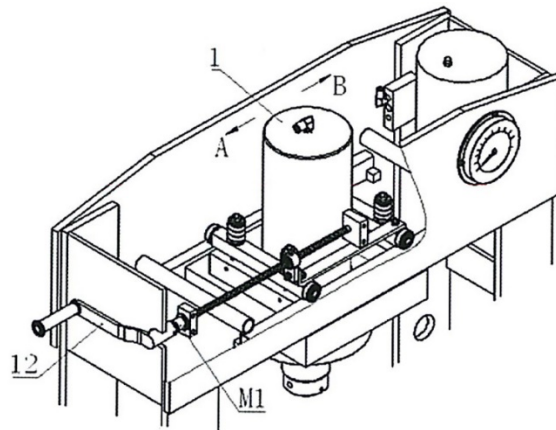


Figure 5-13

5.5.3 Bed Adjustment

⚠ WARNING

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. Insert the handle (12) to the worm shaft (W12)
2. Turning the handle (12) clockwise, the working bed will lift (direction A)
3. Turning the handle (12) counterclockwise, the working bed be lowered (direction B)

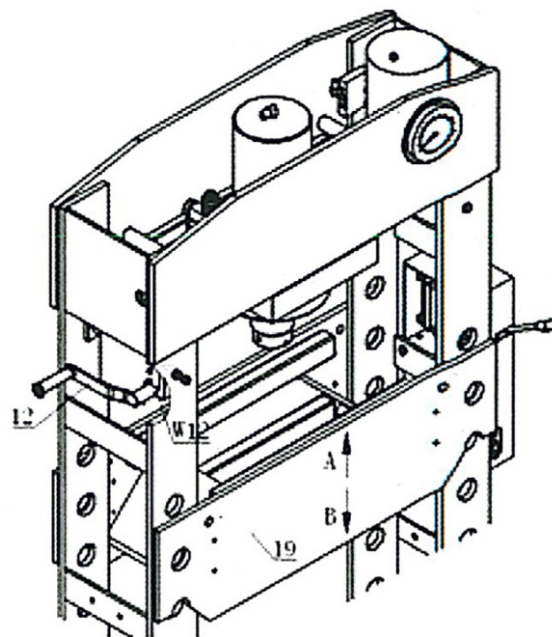


Figure 5-14

5.5.4 Handle

There are 2 handle sockets, one on top and one on the bottom of the pump, the upper one is for high pressure and low speed; and the lower one is for low pressure and faster speed. One handle (50) is used for both pumps.

1. When operating the high pressure pump, insert the handle (50) into the upper handle socket (31) as shown.

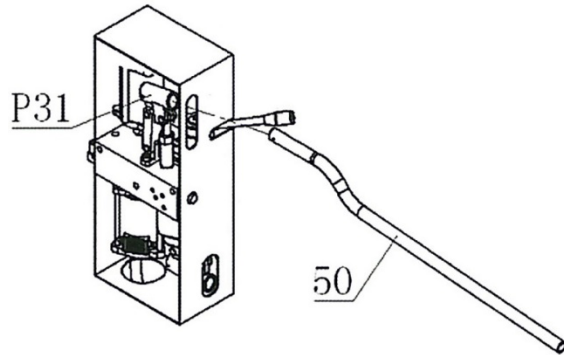


Figure 5-15

2. When operating the low pressure pump, insert the handle (50) into the lower handle socket (43) as shown.

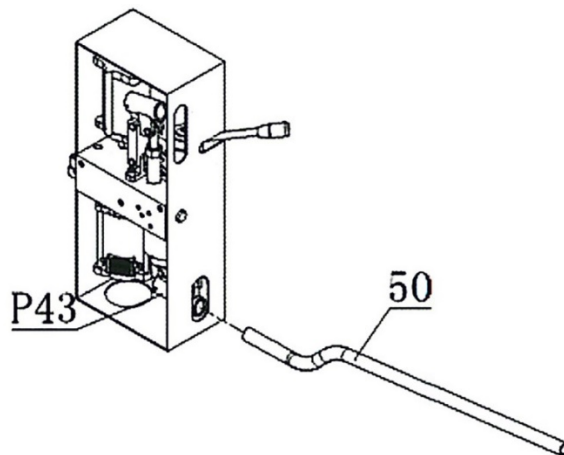


Figure 5-16

6.0 Air Purge

6.1 Air Purge Manually

1. Turn the handle lever of selector valve to position 2.
 - When the handle lever (99) in position 1, the piston rod is returning.
 - When the lever (99) in position 2, the piston rod is stopping moving.
 - When the handle lever (99) in position 3, the piston rod is extending
2. Insert the handle (50) to the lower pressure handle socket and pump the handle quickly at least 20 full strokes.

3. Turn the handle lever (99) of socket valve to position 3, and check if the ram is working properly. If the ram is working properly, air purge is finished, if not, repeat the process.

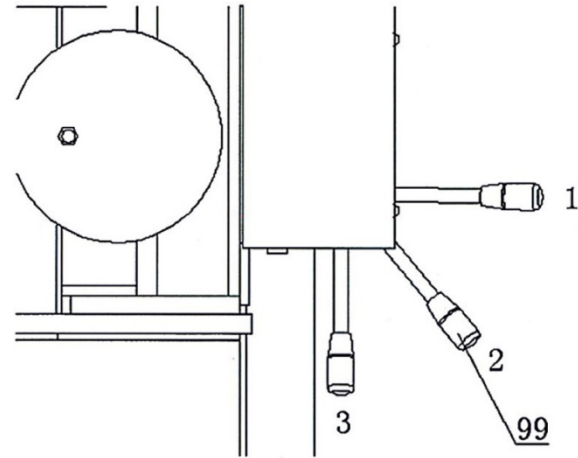


Figure 6-1

6.2 Air Purge by Manual High Pressure Valve

1. Turn the handle lever of selector valve to position 2.
2. Insert the handle tube (50) to the upper high pressure handle socket and pump the handle quickly at least 20 full strokes.
3. Turn the handle lever (99) of socket valve to position 3, and check if the ram is working properly. If the ram is working properly, air purge is finished, if not, repeat the process.

6.3 Air Purge by Air

1. Connecting the air hose (P52) of the air foot valve (P54) to the compressor.
2. Turn the handle lever (99) of selector valve to position 2, and then depress the air foot valve (P54), keeping the air motor working no less than two minutes.
3. Turn the handle lever (99) to position 3, then depress the air foot valve (54), keeping the air motor working and check if the ram is working properly. If the ram is working properly, air purge is finished, if not, repeat the process.

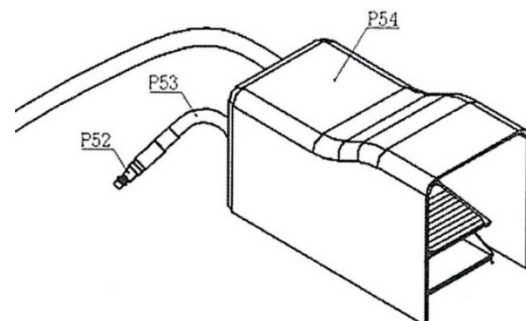


Figure 6-2

7.0 Piston Extension & Retraction

7.1 Extending the Ram

7.1.1 Air Operation

1. Connecting the air hose (P52) of air foot valve to the compressor.
2. Turn the handle lever (99) of socket valve to position 3.
3. Depress the air foot valve (P54), when the piston rod is not under load, the air motor (P23) and air motor (P35) working together, then the piston rod extending quickly. When the piston rod is under load, the air motor (P35) stopping working, and only the air motor (P23) is working, then the piston rod will extend slowly.

7.1.2 Manual Operation

1. Insert the handle tube (50) to the low pressure socket, and then pump the handle to extend the piston rod for quicker operation of the ram.
2. Insert the handle tube (50) to the high pressure socket, and then pump the handle to extend the piston rod for slower operation of the ram.
3. The operator can extend the piston rod either by air or manually. Note that when you operate by air, NEVER operate manually at the same time.

7.2 Retracting the Ram

7.2.1 Air Operation

1. Connecting the air hose (P52) of air foot valve to the compressor.
2. Turn the handle lever (99) of socket valve to position 1.
3. Depress the air foot valve (54), and then the air motor (23) and air motor (P35) work together, and the piston rod returns quickly.

7.2.2 Manual Operation

1. Insert the handle tube (50) to the low pressure socket. Pumping the handle returns the piston rod quickly.
 2. Insert the handle tube (50) to the high pressure socket. Pumping the handle returns the piston rod slowly.
 3. The operator can retract the piston rod either by air or manually. Note that when you operate by air, NEVER operate manually at the same time.
- To stop the movement of the piston rod: stop pumping the handle tube (50) or release the air foot valve (P54), the piston rod will stop moving.

Then turn the handle lever (99) of selector valve to position 2.

8.0 Operation Preplanning

This 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 aligns 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. 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.

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.

9.1 Press Setup

1. Remove all material and the two heel blocks (24) from the bed frame before moving to a different set of holes.

⚠ WARNING

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.

2. Adjust the bed (19) to the appropriate height, then insert the pins (21) to the holes of body frame and lock the circlips (22).

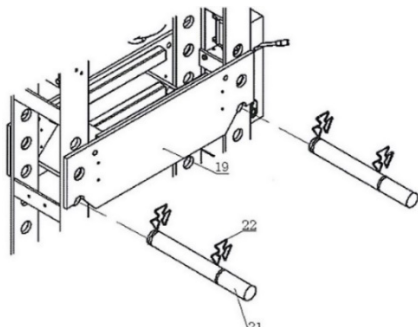


Figure 9-1

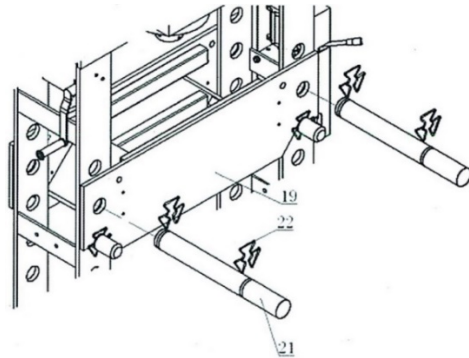


Figure 9-2

3. Place the two heel blocks (20) back onto the frame. They can be used with the flat side up or the V-block side up. Always push the pins down (B1).

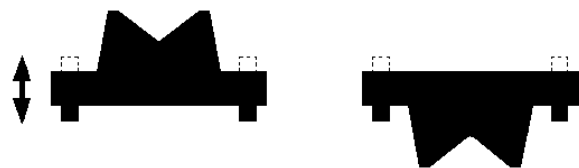


Figure 9-3

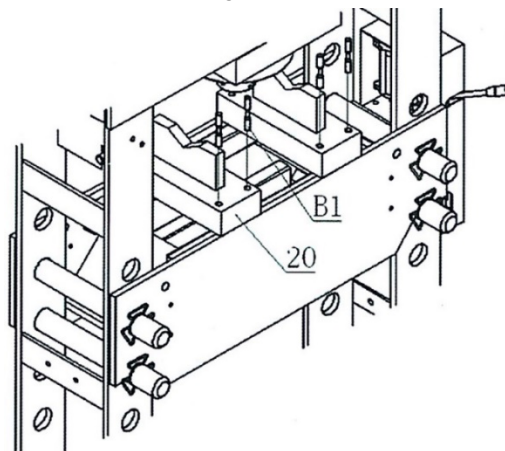


Figure 9-4

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

Note: To prevent the heel blocks from slipping off of the press bed, press down on the four limiting pins of the block.

4. Place the workpiece on the heel blocks (20).
5. Position the ram piston so that it is centered to workpiece.

9.2 Sequence of Operation

1. Insert the piece part into the V-blocks or onto the flat blocks.
2. Close the release valve (50) by turning it clockwise (cw) until it is off.
3. Connect the quick air valve air-in fitting to a 120 psi. (.83 MPa) air source.

4. Press the foot switch on the air valve to let the pump work until the serrated saddle (40) nears the piece part, then release the foot switch. (When an air source is unavailable, pump the handle (49) 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. Turn the handle lever (99) of selector valve to position 3, then depress the air foot valve (P54), both air motors will operate simultaneously, and the piston rod will extend quickly. When the serrated saddle gets close to the work piece, change to manual operation.
7. According to handle tube usage, insert the handle tube into the high pressure socket (P31) and pump the handle tube, the piston rod extends slowly. Make sure that work piece and piston rod are aligned properly.
8. After adjusting the position of work piece, operator can press by air, or manually.

9.2.1 Operating by Air

1. Depress the air foot valve (P54), and both air motors will work simultaneously, when the serrated saddle (38) touches the work piece, the piston rod will go under pressure, and the air motor (P35) will stop working, only the air motor (P23) will continue to work, under this condition, the piston rod extends slowly and press the work piece on the heel block. After pressing, release the air foot valve (P54).

9.2.2 Operating Manually

1. According to handle tube usage, insert handle tube into high pressure socket (P31), and pump the handle tube (50) until finished with the pressing process, then stop pumping.

9.2.3 Operating by Air and Manual

1. Operator can press the work piece both by manual and by air at the same time.
2. Release the pressure: turn the handle lever (99) of selector valve to position 2, the pressure on the piston rod will release automatically.
3. Retract the ram piston.

4. Remove the work piece.
5. When complete, disconnect the air hose from the compressor and clean the machine.

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.

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

12.2 Checking the Hydraulic Oil

The easiest way to check oil level is to extend the ram and measure if the rod fully extends to 11.8" (300mm). If not the oil volume is low, add hydraulic oil to the oil tank as follows.

1. Remove the oil filler nut (58) 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.
4. Purge air from the hydraulic system.

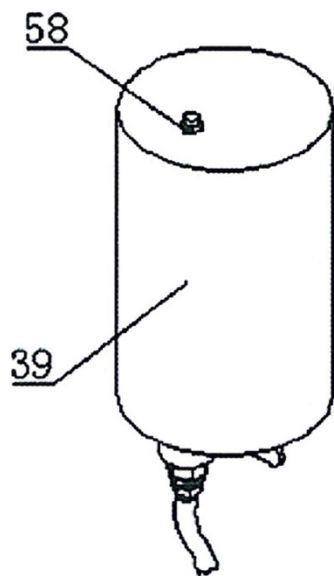


Figure 12-1

12.3 Checking the Cable

Check integrity of bed frame lift system. Make sure cables run free with no binding or twist. Check cable connections and pulleys for wear or damage. DO NOT lubricate any part of the lift system.

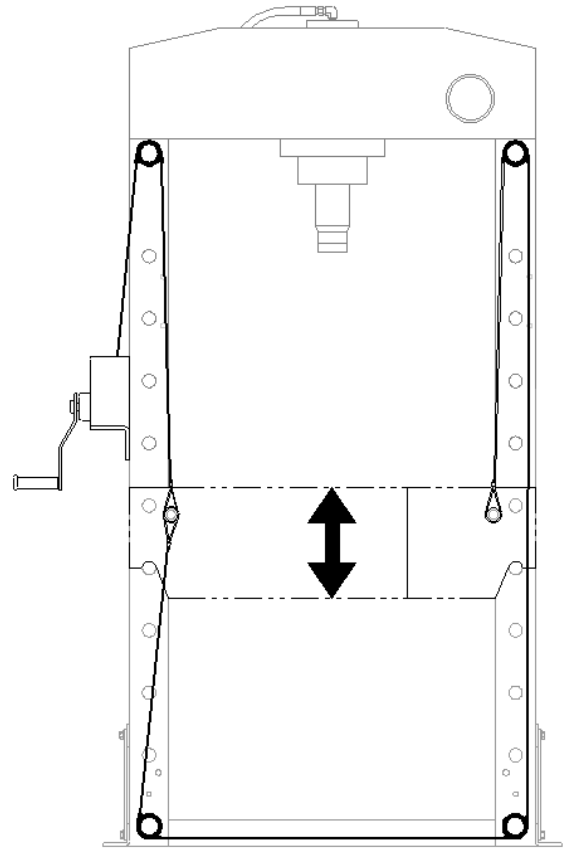


Figure 12-2

13.0 Troubleshooting

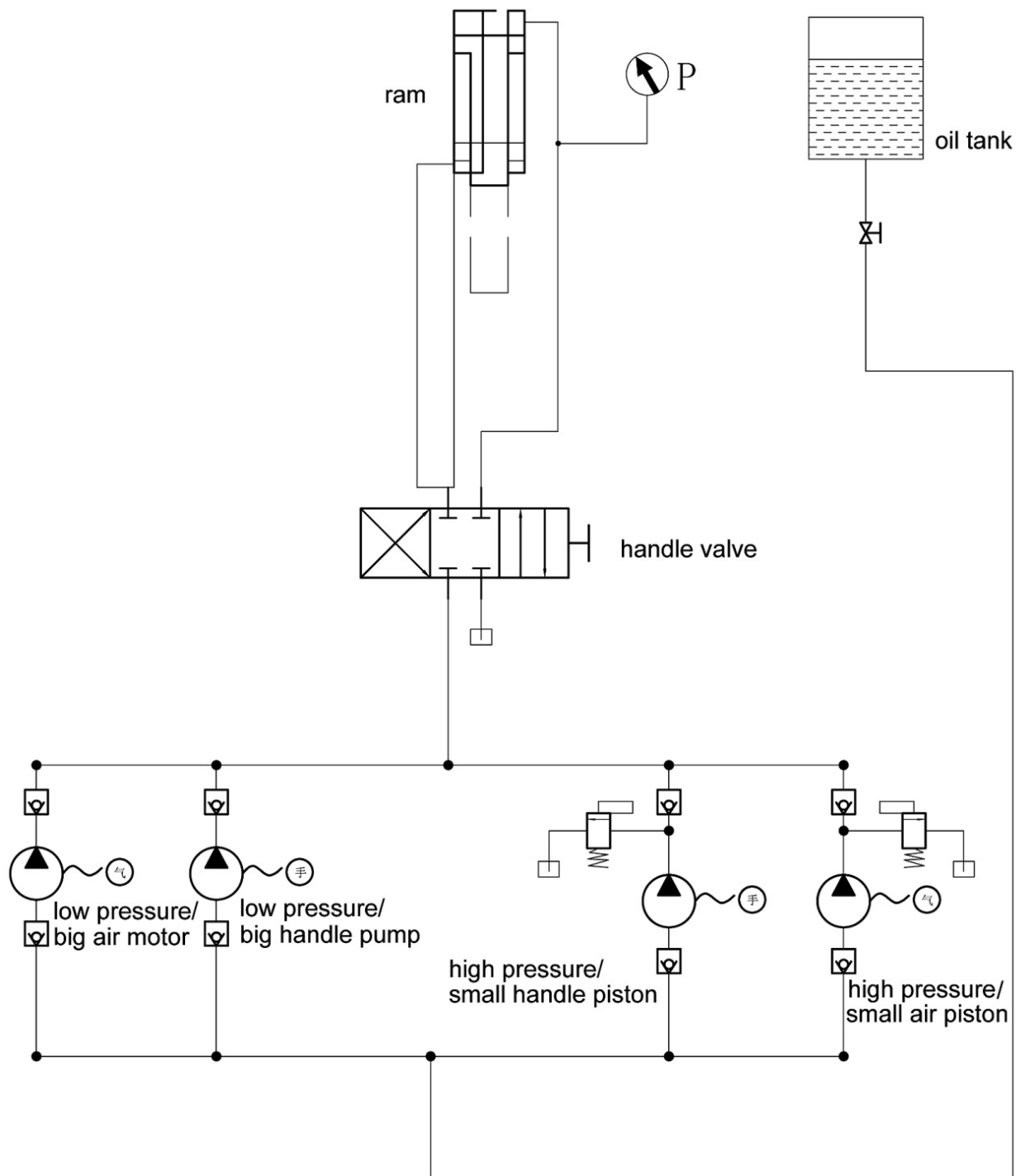
Table 13-1

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.
Leaking oil	Damaged or worn out cylinder seals.	Replace the seals.
	Screwed parts loose.	Re-tighten screws.
	Damaged hose or hoses.	Replace hose(s).

14.0 Hydraulic Schematic

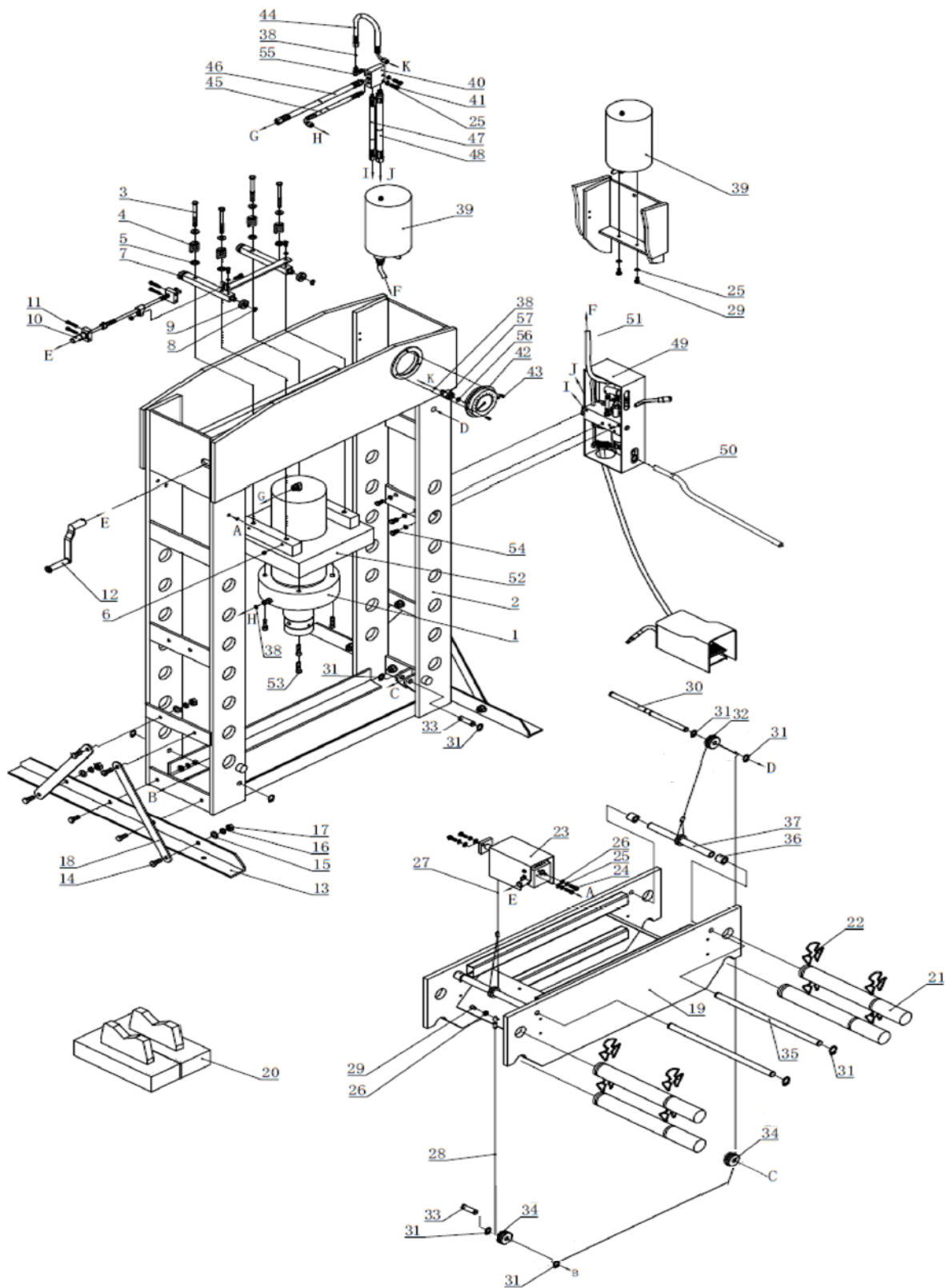
Pump Features: The pump assembly is composed by four pumps, two for high pressure (one is manual and the other is air) which are located on the top of the pump assembly; the other two for low pressure (one is manual and the other is air) which are located in the lower position; and there are one selector valve on the top of the pump assembly.

The two pumps for low pressure are used for quick extension of the piston rod without pressure; and the two pumps for high pressure are working when under pressure. The selector valve is used to control the piston rod's returning or extension.



15.0 Replacement Parts

15.1.1 Main Frame Assembly – Exploded View

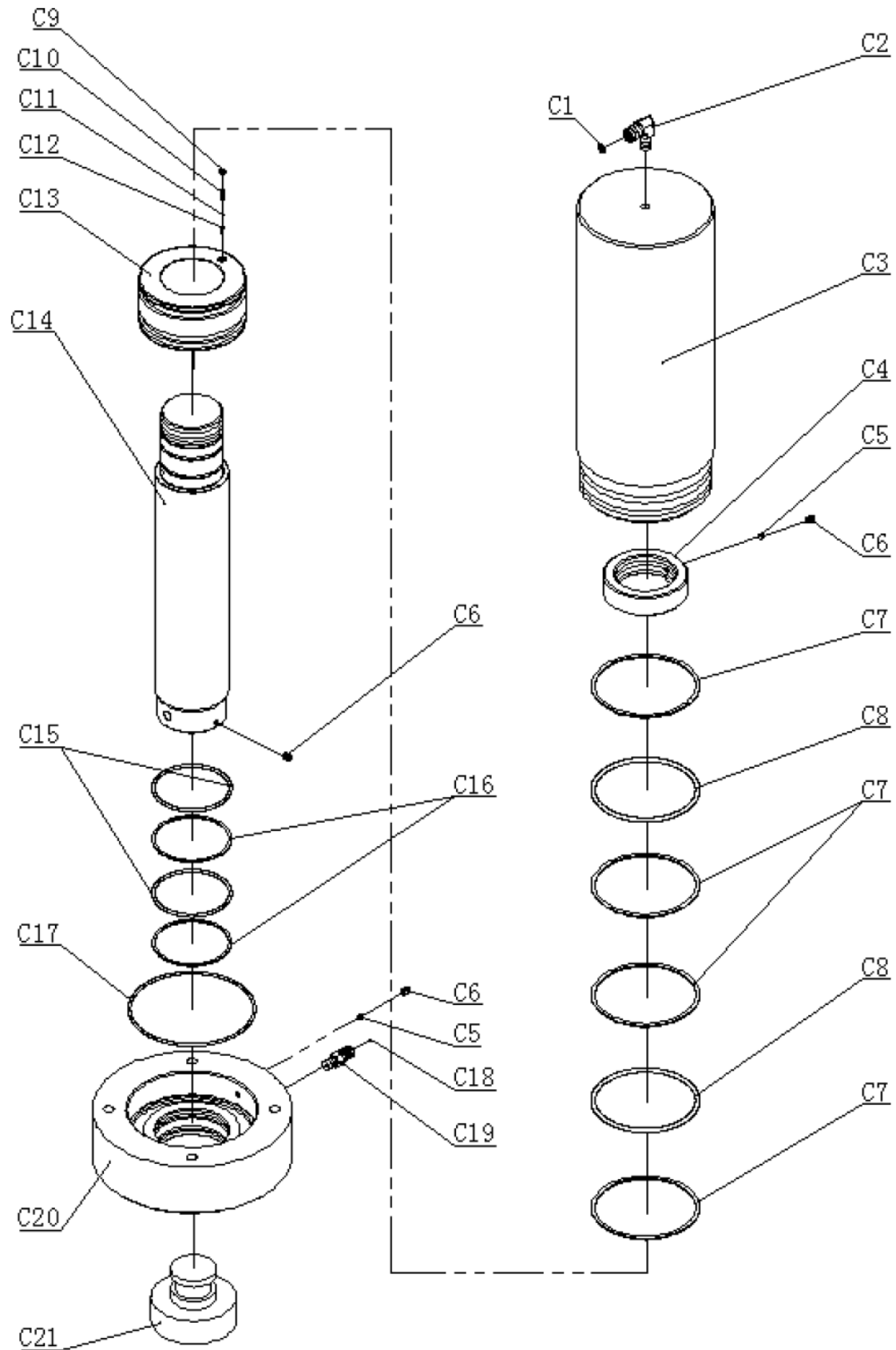


15.1.2 Main Frame Assembly – Parts List

Index No.	Part No.	Description	Size	Qty.
1	BA9-1009976	Ram Assembly		1
2	**	Body Frame		1
3	**	Hex Cap Screw	M12X130	4
4	**	Spring Cove		8
5	**	Spring		4
6	**	Socket Set Screw, Cone Point	M8X10	4
7	**	Steel Tube II		2
8	**	Retaining Rings, EXT	M16	4
9	**	Ball Bearing		4
10	BA1-1555	Ram Moving Equipment		1
11	**	Socket Head Cap Screw	M8X45	4
12	BA9-1020418	Handle Part		1
13	**	Base		2
14	**	Hex Cap Screw	M12X30	12
15	**	Flat Washer	M12	12
16	**	Lock Washer	M12	15
17	**	Hex Nut	M12	12
18	BA1-9599	Support		4
19	BA9-1227442	Working Bed		1
20	BA9-1020583	Heel Block		2
21	**	Pin		4
22	BA9-1227508	Circlip		8
23	BA9-1225313	Working Bed Moving Equipment		1
24	**	Hex Cap Screw	M10X30	4
25	**	Lock Washer	M10	8
26	**	Flat Washer	M10	5
27	BA9-1010151A	Cable 1.6M		1
28	BA9-1008579	Cable 4.3M		1
29	**	Hex Cap Screw	M10X20	3
30	**	Roller Pin		1
31	**	Retaining Rings, EXT	M20	8
32	**	Roller with Cover III		1
33	**	Roller Pin 2		2
34	**	Roller with Cover		2
35	**	Lifting Bar		2
36	**	Tube 2		4
37	**	Bushing		1
38	**	O-ring		2
39	**	Oil Tank		1
40	**	Adapter		1
41	**	Hex Cap Screw	M10X40	2
42	BA9-1019178	Pressure Gauge		1
43	**	Socket Head Button Screw	M5X8	3
44	**	Oil Hose 1		1
45	BA9-1004754	Oil Hose (Down)		1
46	BA9-1004755	Oil Hose 3		1
47	BA9-1004756	Oil Hose 1		1
48	BA9-1004757	Oil Hose 2		1
49	BA9-1004761	Pump Assembly		1
50	BA9-1021840	Handle Tube		1
51	BA9-1004760	Oil Hose		1
52	**	Under Plate		1
53	**	Socket Head Cap Screw	M12X45	4
54	**	Hex Cap Screw	M12X25	3
55	**	Fitting		1
56	**	Nylon Ring		1
57	**	Connecting 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 Ram Assembly – Exploded View

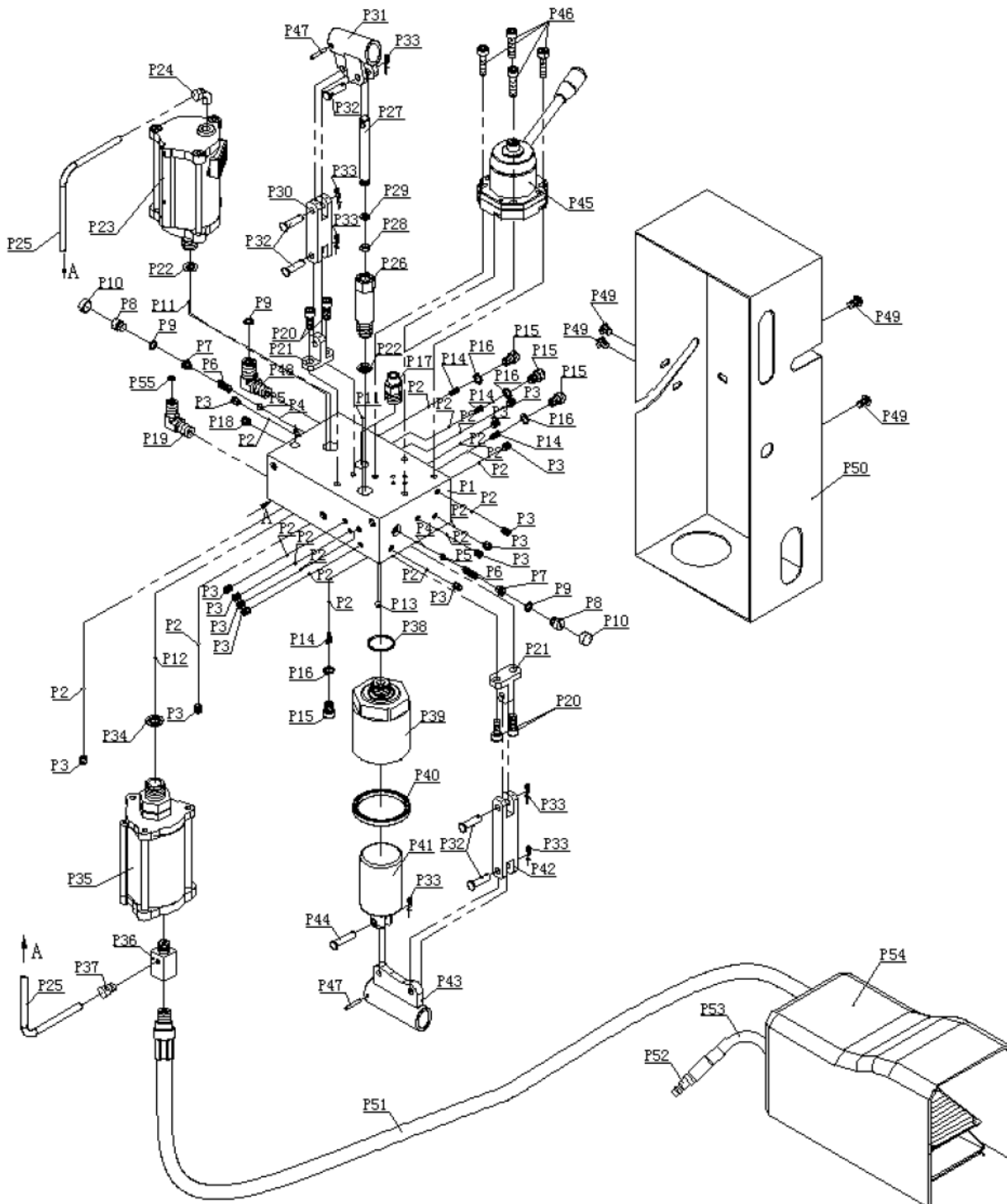


15.1.4 Ram Assembly – Parts List

Index No.	Part No.	Description	Size	Qty.
C1.....	**	O-ring.....		1
C2.....	BA9-1230010	Fitting.....		1
C3.....	BA9-1023048	Cylinder		1
C4.....	**	Nut		1
C5.....	**	Nylon Block.....		2
C6.....	**	Socket Set Screw, Flat Point	M8X10	3
C7.....	BA9-1020407	PTFE Washer		4
C8.....	BA9-1020408	O-ring.....		2
C9.....	BA9-1232553	Screw.....		1
C10.....	BA9-1232550	Spring		1
C11.....	BA9-1232551	Steel Ball	φ4.763	
C12.....	BA9-1232552	Valve Rod		1
C13.....	BA9-1023049	Piston.....		1
C14.....	BA9-1018201	Piston Rod		1
C15.....	BA9-1020409	O-ring		2
C16.....	BA9-1020410	PTFE Washer		2
C17.....	BA9-1010023	O-ring.....		1
C18.....	BA9-1230528	O-ring		1
C19.....	**	Connector I		1
C20.....	BA9-1017543	Ring for Ram		1
C21.....	BA9-1020254	Serrated Saddle.....		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.

15.1.5 Pump Parts Assembly – Exploded View

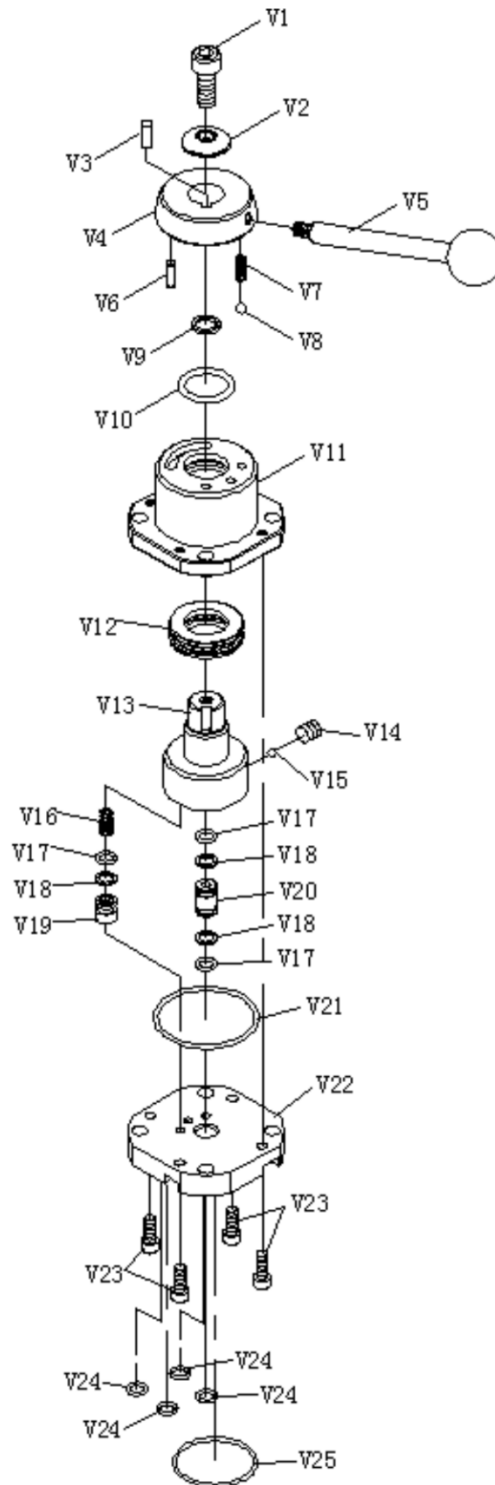


15.1.6 Pump Parts Assembly – Parts List

Index No.	Part No.	Description	Size	Qty.
P1	**	Pump		1
P2	**	Steel Ball	φ6	18
P3	**	Socket Set Screw, Flat Point	M8X10	14
P4	BA9-1012367	Steel Ball	φ3.5	2
P5	BA9-1012368	Steel Ball Base		2
P6	BA9-1012369	Spring		2
P7	**	Screw		2
P8	**	Plug Screw		2
P9	BA9-1012370A	O-ring		2
P10	**	Cover		2
P11	BA9-1010506	Steel Ball	φ5	2
P12	**	Steel Ball	φ7.1438	1
P13	BA9-1010507	Steel Ball	φ8	1
P14	**	Spring		4
P15	**	Plug Screw		4
P16	**	Copper Washer TT-245		4
P17	**	NPT 1/2" Connector		1
P18	**	NPT 1/4" Plug		1
P19	**	Fitting		1
P20	**	Socket Head Cap Screw	M8X20	4
P21	**	Connecting Rod Base		2
P22	BA9-1004766	Copper Washer TT-244		2
P23	BA9-1019743	Air Motor		1
P24	**	NPT 1/4"-8 Connector		1
P25	BA9-1232554	PU Tube 8*6		1
P26	BA9-1021260	Pump Core Base		1
P27	BA9-1021261	Pump Core		1
P28	BA9-1021262	O-ring		1
P29	BA9-1021263	Circlip		1
P30	BA9-1014671	Connecting Bar		1
P31	BA9-1014672	Handle Socket		1
P32	BA9-1014673	Pin 8*30		5
P33	**	R-Pin		6
P34	BA9-1010504	Copper Washer		1
P35	BA9-1019743	Air Motor		1
P36	BA9-1228543	Branch Joint		1
P37	**	Connector		1
P38	BA9-1010508	O-ring 30*2		1
P39	BA9-1232221	Big Pump Core Base		1
P40	BA9-1232222	U-Ring NOK53*63*6		1
P41	BA9-1232223	Big Pump Core		1
P42	**	Big Connecting Bar		1
P43	**	Low Pressure Socket		1
P44	**	Pin 8*35		1
P45	BA9-1004774	Manual Selector Valve		1
P46	**	Socket Head Cap Screw	M8X35	4
P47	**	Spring Pin M4X26		2
P48	BA1-1973	Fitting		1
P49	**	Socket Head Button Screw	M8X10	4
P50	**	Pump Cover		1
P51	**	Air Hose 1		1
P52	**	Air Hose Joint		1
P53	**	Air Hose 2		1
P54	**	Air Valve		1
P55	**	O-Ring		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.

15.1.7 Manual Selector Valve Assembly – Exploded View

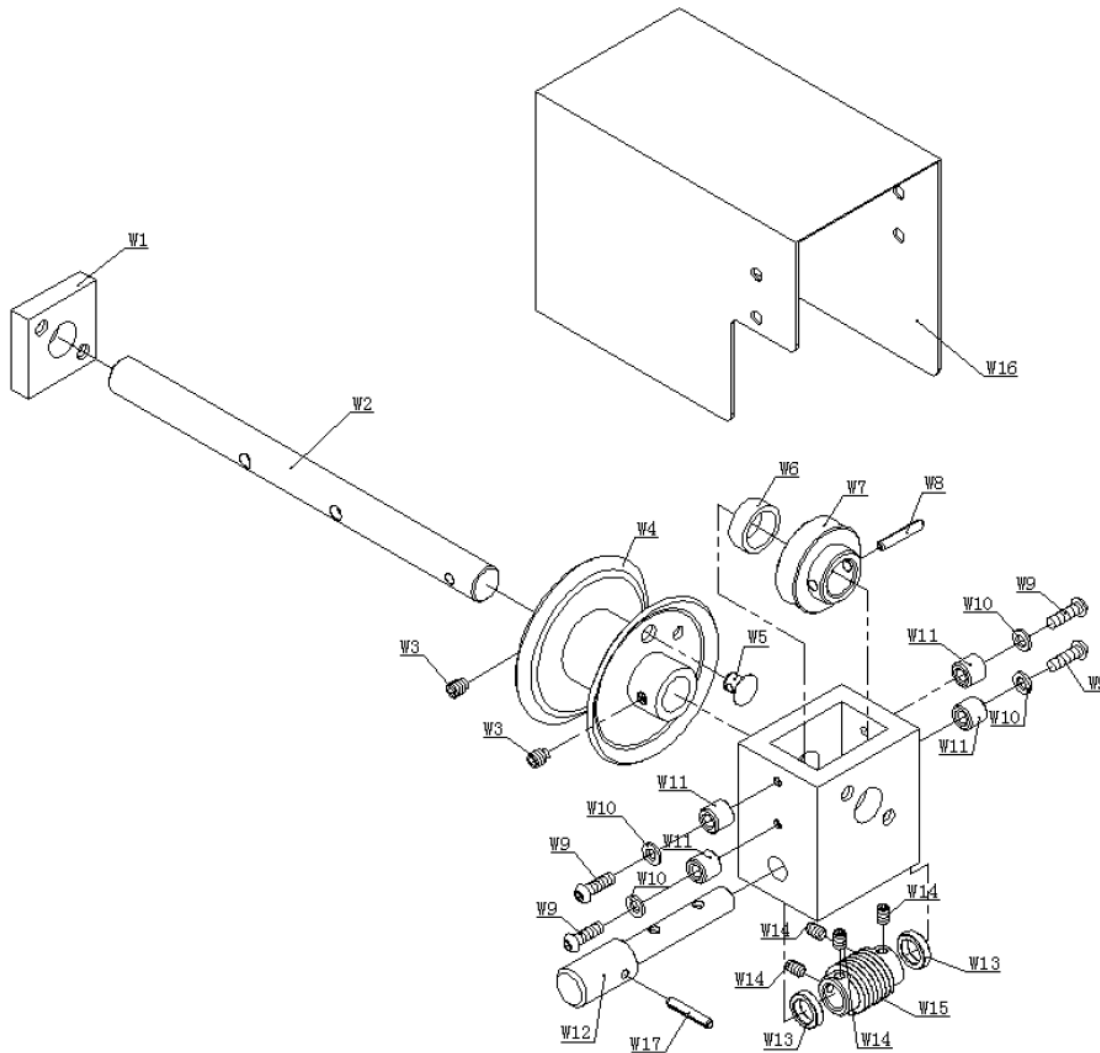


15.1.8 Manual Selector Valve Assembly – Parts List

Index No.	Part No.	Description	Size	Qty.
V1	**	Socket Head Cap Screw	M8X16	1
V2	**	T Washer		1
V3	**	Key		1
V4	**	Moving Cover		1
V5	BA9-1012512	Handle		1
V6	**	Pin		1
V7	BA9-1022680	Spring		1
V8	BA9-1016587	Steel Ball	φ5.5	1
V9	BA9-1012513	Copper Washer		1
V10	BA9-1012514	O-Ring		1
V11	**	Valve Jacket		1
V12	**	Ball Bearing	51105	1
V13	**	Valve Plug		1
V14	**	Hexagon Socket Set Screw		1
V15	**	Steel Ball		1
V16	**	Spring		1
V17	BA9-1012696	O-Ring		3
V18	BA9-1022681	PTFE Washer		3
V19	**	Slide Valve		1
V20	**	Connector		1
V21	BA9-1012695	O-Ring		1
V22	**	Valve Plate		1
V23	**	Socket Head Cap Screw	M6X16	4
V24	BA9-1012698	O-Ring		4
V25	BA9-1012684	O-Ring		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.

15.1.9 Working Bed Lifting Equipment Assembly – Exploded View

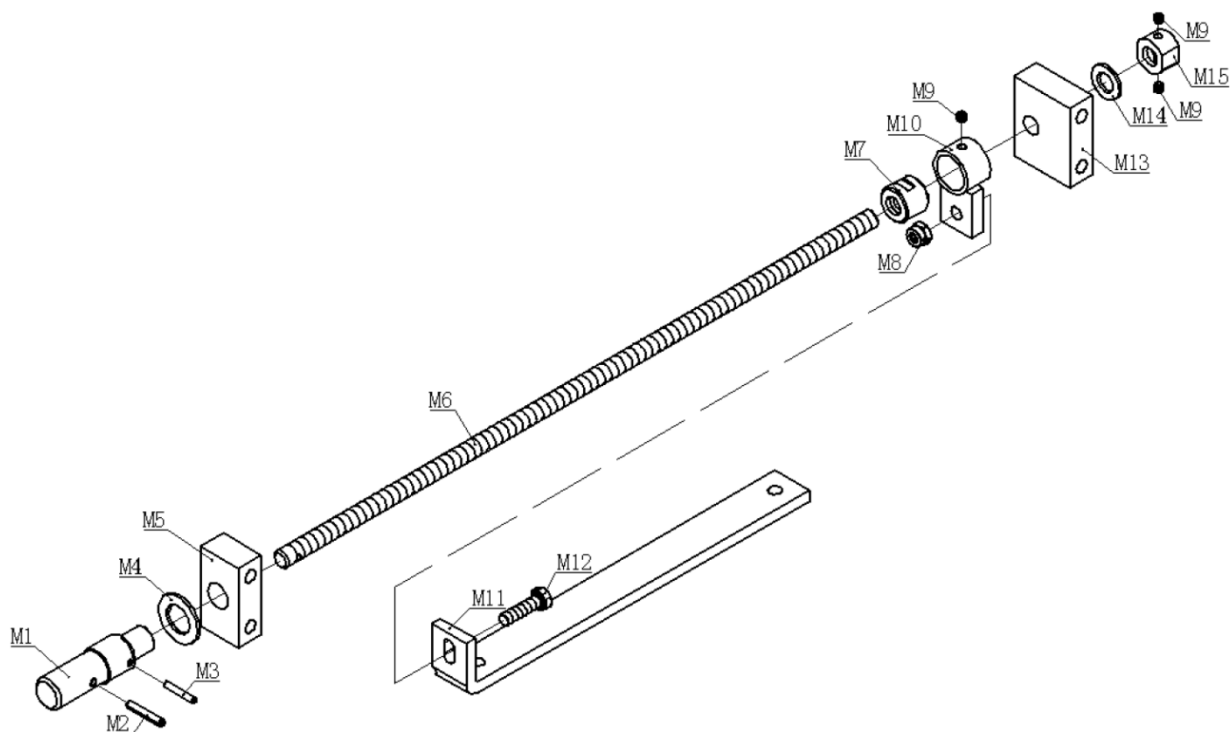


15.1.10 Working Bed Lifting Equipment Assembly – Part List

Index No.	Part No.	Description	Size	Qty.
W1.....	**	Support Plate.....		1
W2.....	BA9-1018160	Worm Shaft.....		1
W3.....	**	Socket Set Screw, Flat Point	M8X10	2
W4.....	**	Winch.....		1
W5.....	**	Rivet		1
W6.....	**	Worm Pad.....		1
W7.....	BA9-1009652	Worm		1
W8.....	BA9-1012581	Spring Pin	6X30	1
W9.....	**	Socket Head Button Screw	M6X20	4
W10.....	**	Flat Washer	M10	4
W11.....	**	Washer		4
W12.....	**	Worm Shaft.....		1
W13.....	**	Worm Washer.....		2
W14.....	**	Socket Set Screw, Cone Point	M6X10	4
W15.....	BA9-1009651	Worm		1
W16.....	**	Winch Cover		1
W17.....	**	Spring Pin	5X30	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.

15.1.11 Ram Moving Equipment Assembly – Exploded View



15.1.12 Ram Moving Equipment Assembly - Parts List

Index No.	Part No.	Description	Size	Qty.
M1	BA9-1020411	Worm Connecting Shaft		1
M2	BA9-1020412	Spring Pin	5X30	1
M3	BA9-1020413	Spring Pin	4X25	1
M4	BA9-1020414	Washer M18		1
M5	**	Support Base 2		1
M6	BA9-1008600	Screw		1
M7	BA9-1014283	Nut		1
M8	BA9-1014284	Damping Nut M8		1
M9	BA9-1008598	Socket Set Screw, Cone Point	M5X6	3
M10	BA9-1008580	Nut Cover		1
M11	BA9-1231627	Connecting Bar		1
M12	BA9-1020415	Socket Head Cap Screw	M8X25	1
M13	**	Screw Base 1		1
M14	**	Washer M12		1
M15	**	Locking 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.