RIVERLAKE

ultra high pressure hydraulic tools www.riverlackco.com

Operation and Maintenance Manual

PH123T, PH-100T,PH-102T,PH-200T2/3 Jaws, 100/200 Ton Safety Cage Hydraulic Puller

Read all instructions carefully and follow all recommended safety precautions to avoid personal injury, product damage or other property loss.

Riverlack is not responsible for any damage or injury caused by unsafe use, lack of maintenance or incorrect operation.

Do not remove warning labels or decals. Contact Riverlack or your local Riverlack distributor if you have any questions.

Keep these instructions for future use.

If you have no high-pressure hydraulic safety training, consult your distributor or service center about Riverlack Hydraulic Safety Courses.

Hydraulic Puller Systems INSTRUCTION SHEET

RIVERLAKE
ultra high pressure hydraulic tools www.riverlackco.com

⚠ The Safety Alert Symbol appears throughout this manual to warn you of potential hazards that may cause physical injury.You must pay close attention to this symbol and strictly comply with all safety messages that follow it, so as to avoid the risk of death or serious injury.
Safety Alert Symbols are used together with specific Signal Words. These words draw attention to safety warnings or property damage messages, and indicate the corresponding level of hazard severity.

► Safety Precautions

⚠ WARNING

Failure to observe and comply with the following precautions could result in death or serious personal injury. Property damage could also occur.

•Read and completely understand the safety precautions and instructions in this manual before operating the cylinder or preparing it for use. Always follow all safety precautions and instructions, including those that are contained within the procedures of this manual.

•Operating procedures will vary, depending on the system arrangement and the specific components being used. Always read, follow and completely understand all manufacturer's instructions when operating pumps, valves and all other devices used with the cylinders. Follow all safety precautions contained in the manufacturer's manuals.

•Always wear appropriate personal protective equipment (P.P.E.) when operating hydraulic equipment. Be sure to wear eye protection, work gloves and protective clothing. Use of additional P.P.E. safety items such as dust mask, non-skid safety shoes, hard hat, and hearing protection (used as appropriate for the conditions) will reduce the chance of personal injuries. The use of these items may also be required by local regulations or laws.

•Do not handle pressurized hoses. Escaping oil under pressure can penetrate the skin. If oil is injected under the skin, see a doctor immediately.

•Do not pressurize disconnected couplers.

•Do not remove or disable the pump relief valve.

•The system operating pressure must not exceed the pressure rating of the lowest rated component in the system.

•Never set a relief valve to a higher pressure than the maximum rated pressure of the pump and puller. If ratings are different, relief valve setting should not exceed the setting of the lowest rated component (pump or puller).

•Overloading may cause equipment failure and possible personal injury.

•Be sure setup is stable before lifting load. The puller should be located on a firm and level surface capable of supporting the full load.

•The puller should be positioned in line with the shaft or the component to be disassembled.

•Do not use the puller if the surface which will be impacted by the cylinder is not sufficiently flat.

•Do not use the puller if the pressure required to disassemble the component is higher than the maximum energy absorption capacity of the shaft.

•Do not weld, drill or otherwise modify a cylinder to attach a base plate or other support unless approved in writing by Riverlack Engineering Department. Use only the provided bolt holes.

•Always perform a visual inspection of the puller before placing it into operation. If any problems are found, do not use the puller. Have the puller repaired and tested before it is returned to service.

•Never use the puller if is leaking oil, damaged, altered or in need of repair.

•Always lift the puller using a hoist, crane or other suitable lifting device of sufficient rated capacity. Use only the supplied lifting eyes to attach the puller to the lifting device. Replace any missing or damaged lifting eyes.

•The puller can also be lifted and moved by a forklift using the forklift pockets.

•Allow only trained and experienced personnel to supervise and perform the puller operation.

•Be certain that no persons are working on or near the puller before the operation begins. Alert all personnel in advance that puller operation is about to occur.

•Keep all personnel clear of the work area while the puller is working. To avoid personal injury, keep hands and feet away from cylinder and load during operation.

•Maintain communication with the operator at all times during pulling operation to avoid accidents. Use hand signals, two-way radios or other appropriate forms of communication (as required by applicable laws and regulations) if the load is not visible to the operator.

•Operate pump and valve as required to ensure that the puller is working at a controlled rate.

•Closely watch the operation at all times. Stop the puller immediately if the setup becomes unstable.

•Always be certain that hydraulic pressure is fully relieved from the puller before disconnecting hydraulic hoses, loosening hydraulic fittings, or performing any cylinder disassembly or repair procedures.

•Expect system to be under high pressure when at rest despite gauge reading zero. Failure to follow procedure to dump pressure from the system could result in death or serious personal injury.

⚠ CAUTION

Failure to observe and comply with the following precautions could result in minor or moderate personal injury. Property damage could also occur.

•Be careful to avoid damaging hydraulic hoses. Avoid sharp bends and kinks when routing hydraulic hoses. Do not exceed the minimum bend radius specified by the hose manufacturer. Using a bent or kinked hose will cause severe back-pressure. Sharp bends and kinks will internally damage the hose, leading to premature hose failure.

•Do not drop heavy objects on hoses. A sharp impact may cause internal damage to hose wire strands. Applying pressure to a damaged hose may cause it to rupture.

•Do not lift hydraulic equipment by the hoses or couplers. Use the cylinder lifting eyes and appropriately rated lifting equipment.

•Keep hydraulic equipment away from flames and heat. Excessive heat will soften packings and seals, resulting in fluid leaks. Heat also weakens hose materials and packings.

•For optimum performance, do not expose hydraulic equipment to temperatures of 150˚F [65˚C] or higher. Protect all hydraulic equipment from weld spatter.

•Immediately replace worn or damaged parts with genuine Enerpac parts. Enerpac parts are designed to fit properly and to withstand high loads. NonEnerpac parts may break or cause the product to malfunction.
•Immediately replace worn or damaged parts with genuine Riverlack parts. Riverlack parts are designed to fit properly and to withstand high loads. Non-Riverlack parts may break or cause the product to malfunction.

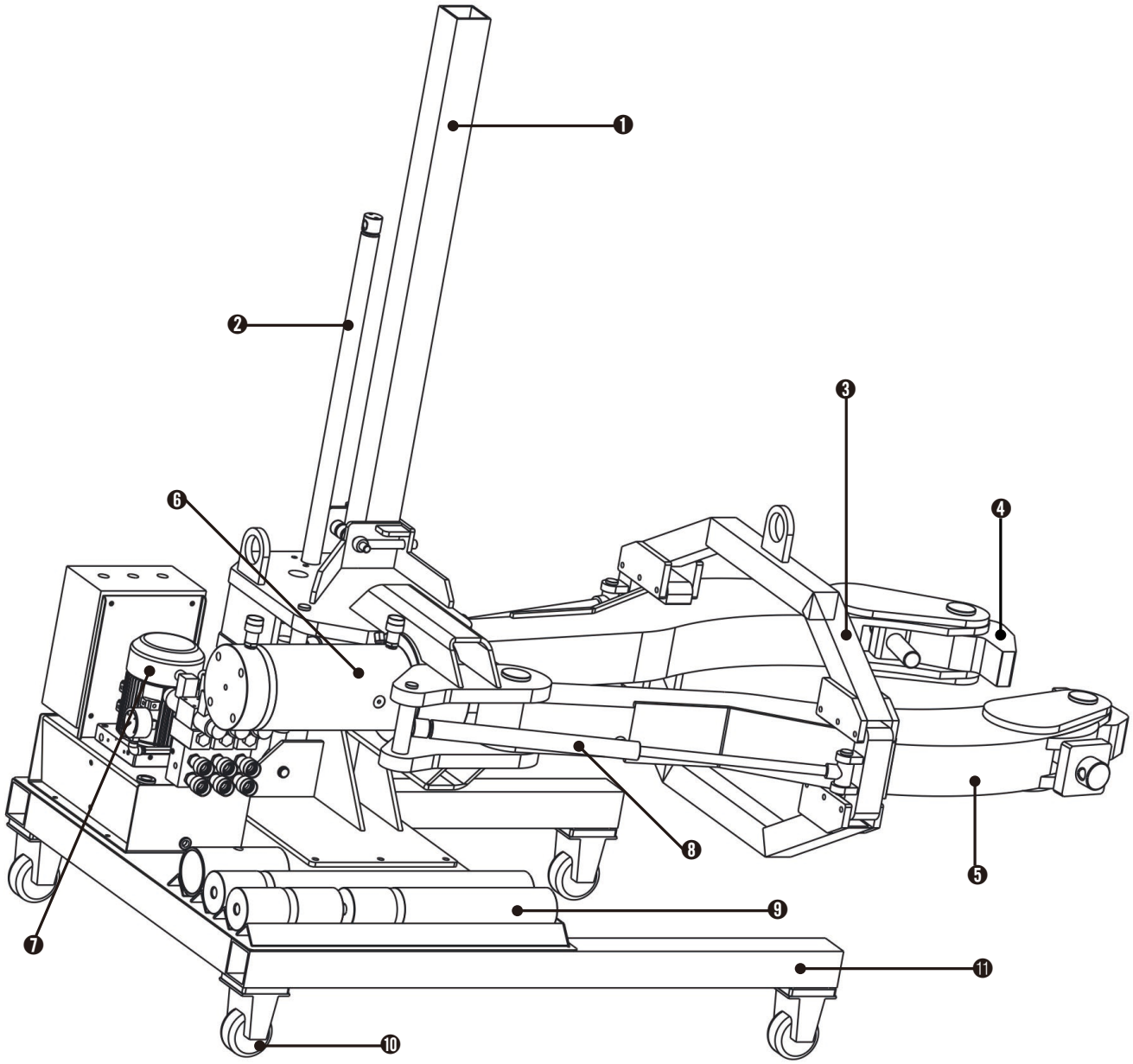
NOTICE

Failure to observe and comply with the following precautions could result in property damage and/or void the product warranty.
•Always use Riverlack pumps and hoses
•Always use Riverlack replacement parts.
•Hydraulic equipment must only be serviced by a qualified hydraulic technician. For repair service, contact the Riverlack authorized service center in your area.
•To help ensure proper operation and best performance, use of Riverlack oil is strongly recommended.

Compliance Statement(s)

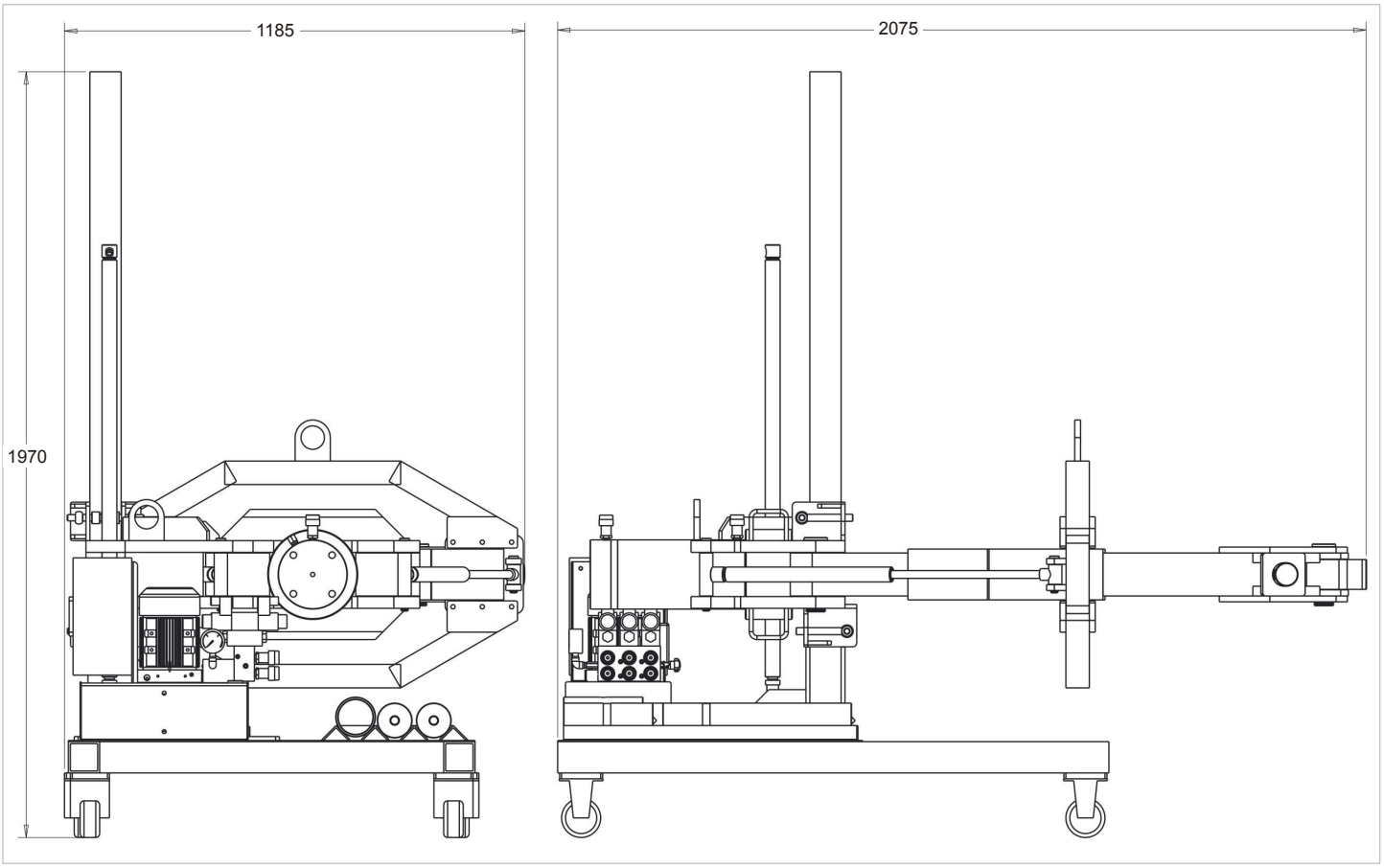
Riverlack declares that the product has been tested and conforms to applicable standards and that the product is compatible with all EU and UK Requirements.

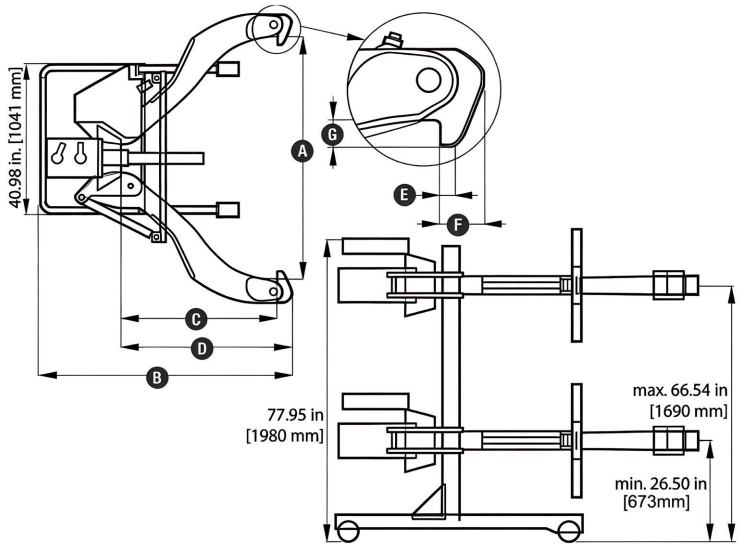
► PH102T Features & Components



NO	Name	NO	Name
1	Mast	7	Hydraulic Pump
2	Hoist Cylinder	8	Cage Cylinder
3	Cage	9	Pushing Adaptor
4	Jaw Tip	10	Casters
5	Jaw	11	Base
6	Pushing Cylinder		

► PH102T Hydraulic Puller Outline Dimensions





Model Number	Capacity	Number of Jaws	Spread (A)	Overall Length (B)	Reach (C)	Jaw Length (D)	Jaw Tip Width (E)	Tip Clearance (F)	Tip Depth (G)	Weight
PH-102T	100 tons [890 kN]	2	7.5 to 70inch [191 to 1778 mm]	77 inch [1956 mm]	50 inch [1270 mm]	53 inch [1346 mm]	1.25 inch [32 mm]	3.5 inch [89 mm]	3.5 inch [89 mm]	1700 lbs [771 kg]
PH-100T	100 tons [890 kN]	3	7.5 to 70inch [191 to 1778 mm	77 inch [1956 mm]	50 inch [1270 mm]	53 inch [1346 mm]	1.25 inch [32 mm]	3.5 inch [89 mm]	3.5 inch [89 mm]	1950 lbs [885 kg]
PH-123T	100 tons [890 kN]	3	7.5 to 70inch [191 to 1778 mm	77 inch [1956 mm]	50 inch [1270 mm]	53 inch [1346 mm]	1.25 inch [32 mm]	3.5 inch [89 mm]	3.5 inch [89 mm]	1950 lbs [885 kg]
PH-200T	200 tons [1779 kN]	4	6.5 to 70 in. [203 to 1778 mm]	78.5 in. [1994 mm]	48 in. [1219 mm]	53 in. [1346 mm]	1.25 in. [32 mm]	3.5 in. [89 mm]	3.5 in. [89 mm]	4150 lbs. [1882 kg]

► OPERATION

► 1. RECEIVING PREPARATION

1. Place the transport box smoothly and firmly on a level ground for subsequent operations.
2. Open the small side panel of the box and check that the pull rod is placed vertically.
3. Remove the remaining plywood in the box and clean up debris inside.
4. Inspect the appearance and key components of the tractor for any bumps, damage or other abnormalities that may have occurred during transportation.

► 2. ADJUSTMENT

1.HOIST STROKE SPEED ADJUSTMENT

The top of the lifting cylinder is equipped with a two-way flow control valve. Its core function is to control the descending speed of the pull rod assembly, preventing equipment impact or potential safety hazards caused by excessively fast descending. The adjustment specifications are as follows:

2.CHANGING THE JAW SPREAD:

If opening/closing the jaws using the standard cage setting does not provide enough spread or does not provide enough closure,
use the following adjustments to achieve the maximum and minimum spreads.

a. Support the jaws.
b. Remove 6 cap screws, lock washers and nuts on 1 jaw guide at a time.
c. Slide jaw guide inward/outward on cage 1 bolt hole.
d. Replace 4 cap screws, lock washer, and nuts and tighten appropriately.
e. Reverse this process to return to standard jaw spread.

3.ADJUSTING JAW TIPS:

Adjust jaw tips by turning 1 ¼” cap screw.
NOTE: Always use maximum pulling surface of jaw. To angle tip inward, turn cap screw clockwise. To angle tip outward, turn cap screw counterclockwise. Before pulling, always make certain machined caps are properly fitted to curved surface.

4.ADJUSTING SLIDE ROLLERS:

a. Lower slide and puller assembly until it rests solidly on base.
b. Loosen 5/8” hex bolt.
c. Move roller using eye bolts on each side of roller.
d. Adjust roller until equal spacing is obtained between mast and slide tube on both roller side and opposite side.
e. Tighten locking nut on eye bolt.
f. Tighten 5/8” hex bolt.

5.REMOVING PULLER FROM THE CART:

a. Support puller weight using lifting brackets provided.
b. Close puller hoist vertical control valve.
c. Disconnect puller hoist hose coupler at control panel.
d. Remove 2 of the ½” bolts which fasten locking plate to the puller lift bracket.
e. Remove puller from cart by rotating cart while keeping puller stationary

► 3. ELECTRICAL INSPECTION

a.Check the equipment nameplate to confirm the power supply specification is 220V 50Hz, and prepare the power supply line and leakage protection circuit breaker that meet the specifications.

b.Inspect the power supply line: no damage, loose connection or aging, reliable grounding protection, and wire diameter meeting the equipment power requirements.

c.Power connection: Insert the equipment power plug into the 220V power socket and ensure it is firmly connected without looseness.

► 4.HYDRAULIC SYSTEM PREPARATION

1.Check the oil level in the hydraulic power unit tank: the oil level should be in the middle of the oil gauge scale. If the oil level is too low, add the specified type of hydraulic oil. Mixing different types of hydraulic oil is prohibited.

2.Inspect hydraulic hoses and fittings: no damage, kinking or aging, intact fitting seals with no signs of leakage.

- Main frame, columns and clamp components free of deformation, cracks or excessive wear
- Mobile casings in good condition with effective braking, base flat and stable
- All pins and connecting bolts free of looseness or loss

3.Adjust equipment posture:

- Unfold the vehicle-mounted base, lock the caster brakes, and ensure the equipment is placed on level, solid ground
- Adjust the column height to match the workpiece position and tighten the positioning bolts
- Test the clamp opening/closing and cylinder extension/retraction to ensure no jamming or abnormal noise

► 5.STARTUP TEST AND FUNCTION VERIFICATION

• Select 2-jaw or 3-jaw tool according to the drawing workpiece specification. When switching jaw quantity, loosen the main cylinder fixing bolts, rotate the cylinder body to the calibrated position matching the jaw tool, then retighten. Select the appropriate drawing interface and install drawing feet according to the workpiece structure. Choose the compensation rod of corresponding length based on the relative assembly position between the drawing part and the workpiece.

• Connect the equipment power supply. If the power indicator shows red, the equipment is in non-operating state. Troubleshoot before subsequent operations.

• For lifting adjustment of the pull rod assembly, ensure stable operation and precise positioning to lay the foundation for subsequent drawing operations. The specific operations are as follows:

a. Switch the hydraulic cylinder control valve rod to the "Pull Rod Lifting Oil Supply" position to provide hydraulic power for pull rod lifting.

b. Start the hydraulic pump, turn on the remote up control switch to make the pull rod assembly rise slowly. After reaching the target working height, release the remote switch to complete pull rod lifting and positioning.

c. To lower the tractor height, start the hydraulic pump, turn on the remote down control switch to make the pull rod assembly descend slowly. After reaching the target position, close the vertical control valve to ensure firm positioning.

• Trial Cycle

Press the lifting or lowering button to check whether the lifting device works normally.

Press the open or clamp button and check whether the open-clamp action is correct.

Press the forward or backward button to check whether the forward and backward movement of the

main cylinder is normal.

► 6.SET-UP | PULLING AN OBJECT

SET-UP:

1. Transport the puller by use of the puller cart or forklift.
2. Line the puller up to the workpiece.
3. Open the jaws.

OPENING THE JAWS:

I. Place cylinder control valve lever in “Oil Supply” position.

II. Place cage control lever in “Jaw Open” position and activate pump by pushing remote switch to the “On” position to open jaws to the desired spread.

4. Position the workpiece to be removed in between the jaws.
5. Continue to adjust the height until the workpiece and extending cylinder are aligned. See RAISING THE PULLER on page 5.
6. Close the jaws.

CLOSING THE JAWS:

I. Place cylinder control valve lever in “Oil Supply” position.

II. Place cage control lever in “Jaw Closed” position and activate pump by pushing remote switch to the “On” position to close jaws to the desired spread or for clamping.

7. Adjust the jaw tips appropriately.

PULLING AN OBJECT:

1. Extend the cylinder ram towards the workpiece until there is contact.

EXTENDING CYLINDER:

I. Place cylinder control valve in “Extend” position.

II. Activate pump with jog switch.

2. Continue to extend the ram. The workpiece will begin to move gradually off the shaft.
3. Retract the cylinder.
4. Completely remove the workpiece.

RETRACTING CYLINDER:

I. Place cylinder control valve in the “Retract” position.

II. On a single acting cylinder the cylinder ram will retract without activating the pump.

► 7.Operation Completion

1.Pressure Release: Operate the control handle to relieve pressure, fully release residual pressure in the hydraulic system, and ensure no pressure in the pipelines.

2.Equipment Reset:

- Retract the main cylinder piston rod to the initial position
- Open the clamps to maximum stroke
- Adjust the column to the lowest transport position

3.Turn off the power unit: Press the "Stop" button, disconnect the 220V power plug, arrange and store the power cord.

► Troubleshooting

No.	Problem	Possible Causes	Solutions
1	1. Trolley hydraulic cylinder cannot lift 2. Spindle cannot advance / retract 3. Arm cannot close / open	Pump unloading valve is open	Close the pump unloading valve
		Directional control valve not in proper position	Move directional control valve to proper position
		Fittings not fully tightened	Tighten fittings
		Low pump oil level	Add oil to pump reservoir as required
		Pump failure	Repair or replace pump if necessary
		Hydraulic cylinder seal leakage	Repair or replace cylinder
2	1. Trolley hydraulic cylinder lifts only partially 2. Spindle advances / retracts only partially 3. Arm closes / opens only partially	Low pump oil level	Add oil to pump reservoir as required
		Fittings not fully tightened	Tighten fittings
		Cylinder piston rod stuck	Repair or replace cylinder
3	1. Trolley hydraulic cylinder lifts erratically 2. Spindle advances / retracts erratically 3. Arm closes / opens erratically	Air in hydraulic system	Bleed air from hydraulic system
		Cylinder piston rod stuck	Repair or replace cylinder
4	1. Trolley hydraulic cylinder lifts slower than normal 2. Spindle advances / retracts slower than normal 3. Arm closes / opens slower than normal	Connection leakage	Repair connection leakage
		Fittings not fully tightened	Tighten fittings
		Pump failure	Repair or replace pump if necessary
5	1. Trolley hydraulic cylinder lifts but does not stay in raised position 2. Spindle cannot advance / retract 3. Arm cannot close / open	Pump failure	Repair or replace pump if necessary
		Connection leakage	Repair connection leakage
		Incorrect system setup	Check hose connections between pump and cylinder
		Cylinder seal leakage	Repair or replace cylinder
6	Hydraulic cylinder leaks oil	Cylinder seal worn or damaged	Repair or replace cylinder
		Internal cylinder damage	Repair or replace cylinder
		Loose connection	Tighten or repair connection
7	Trolley hydraulic cylinder cannot lower, or lowers slower than normal	Directional control valve not in proper position	Move directional control valve to proper position
		Pump reservoir overfull	Drain oil from pump reservoir as needed
		Improper hose connection	Check hose connections
		Restrictive hose limits oil flow	Replace with larger diameter hose
		Internal cylinder damage	Repair or replace cylinder