

## OPERATING INSTRUCTIONS

### Hand Pumps- 700 Bar (10,000 psi)

Model No.: PH1035, PH1070, PH2035, PHA2035, PH2070, PHA2100,  
PH2220, PH2350, PH2700, PHD2220, PHD2350, PHD2700, PF2070



#### **WARNING**

Read and follow all Safety Instructions, Warnings, Cautions and Important information provided in this manual before using the equipment. They are provided for the safety of those operating the equipment and to prevent personal injury and/or damage to property when using this equipment.

**THIS EQUIPMENT SHOULD ONLY BE USED BY OPERATORS  
WHO HAVE BEEN TRAINED IN THE SAFE USE OF HIGH  
PRESSURE HYDRAULIC EQUIPMENT**



## **WARNING:**

- Always wear the correct personal protective equipment when operating high pressure hydraulic tools and equipment.
- Always stay clear of loads supported by hydraulic systems, the load must be secured mechanically before work can commence.
- Always keep your hands and feet clear of the work activity during operation to avoid personal injury.
- Never handle pressurised hydraulic hoses. Escaping oil under pressure can penetrate the skin causing serious injury. Contact a doctor immediately if oil is injected under the skin.
- Never operate the system above the maximum rated output pressure.
- Never connect to the system components, fittings, couplers, hoses, valves etc. that are NOT rated to the full system operating pressure.
- Never exceed equipment ratings. Never attempt to lift a load greater than the capacity of the cylinder. Overloading causes equipment to fail and possible personal injury or damage to equipment.
- Boss cylinders and pumps are designed to operate at a maximum of 700 bar (10,000 psi) unless specified. Never connect a cylinder to a pump with a higher output pressure.
- Never use pumps and cylinders with disconnected couplers. Always ensure where couplers are used that they are all fully engaged. Failure to do so can result in the system becoming overloaded and can result in a catastrophic component failure potentially causing severe personal injury.
- Always ensure the system has a stable set up before operating the equipment. Cylinders should be located on a flat surface that has the capacity to support the load, cylinder bases and other supports should be used where applicable. Avoid situations where the load is not directly centred on the cylinders. Loads that are off centre place considerable strain on the cylinder and piston. This can result in the load slipping or the cylinder failing with potentially dangerous results. Always distribute the load evenly across the entire surface of the cylinder saddle. Always use a saddle to protect the cylinder rod.



## **WARNING:**

- Never weld to or modify cylinders, pumps or other system components as they have been engineered and tested to meet specific standards.
- Always immediately replace worn or damaged parts with genuine Boss Hydraulics parts. The use of non-genuine parts can result in failure potentially causing personal injury and/or property damage.



## **CAUTION:**

- Avoid damage to hydraulic hoses from sharp objects, vehicles and heavy objects falling on them, never kink or fit hoses with a sharp bend in them. All of these things can cause internal damage to the hose leading to premature hose failure.
- Keep hydraulic equipment away from sources of heat and flames. Heat will soften seals and hoses which results in hydraulic fluid leaks. For optimum performance, equipment should not be exposed to temperatures of 65° C (150° F) or higher. Always protect hoses from weld splatter or sparks from cutting or grinding tools.



## **IMPORTANT:**

- Never lift or carry hydraulic equipment by the hose or couplers. Use carry handles or another safe method to transport or lift components.
- High pressure hydraulic equipment should only be serviced, adjusted, repaired and tested by qualified hydraulic technicians.
- After unpacking the equipment it should be inspected by a qualified person to ensure there is no shipping damage or missing part.
- A gauge is highly recommended to be used, so the pressure in the hydraulic system can be monitored.

# 1. SETUP/ INSTALLATION

## Connecting the Pump:

- Remove shipping plugs from pump port outlets.
- Connect hoses to pump. To seal threads, use thread sealer or thread tape. When using seal tape, apply tape one thread back from end of fitting to prevent excess tape entering the hydraulic system.
- Install a pressure gauge in the system to monitor pressure.
- Connect the hoses to your cylinder or tool.
- For single-acting cylinders, connect one hose from the pump to the cylinder; For double-acting cylinders, connect two hoses. Connect one hose from Port A of the pump to the advance port of the cylinder. Connect the second hose from Port B of the pump to the retract port of the cylinder.

## IMPORTANT:

- To prevent contaminants from entering the hydraulic system, do not operate the pump with oil fill plug loosened or removed.

## Before Using The Pump:

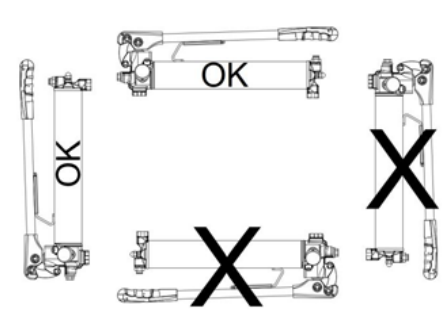
- Inspect all system fittings and connections to ensure they are tight, rated to 700 Bar and are leak free.
- Check oil level in the reservoir and add oil if needed. Refer to instructions in Maintenance section.

## WARNING:

- In certain situations the pump handle can “spring back”. Always keep your body to the side of the pump, away from the line of force of the handle.
- When operating the pump, keep hands and fingers away from the pinch point area between the pump and the lifting handle.
- Never add extensions to pump handle. Extensions may cause the pump to become unstable during operation.
- To prevent mechanical damage, do not use the pump handle to carry the pump. Use the designated carry handle.

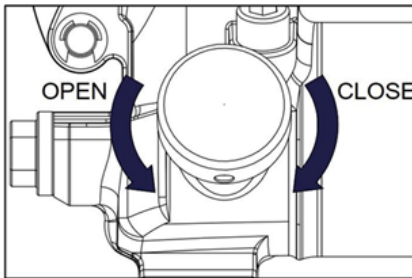
## Pump Position:

- The pump may be used in either the horizontal or vertical position. When operated in the vertical position, the hose end of the pump must be pointed down, or the pump will pick up air and will not build up pressure.



## Two Stage Pumps:

- With no load on the pump, the pump operates in the high flow stage for fast advance of the cylinder. When the load is increased, the pump changes automatically to the low flow stage to allow for higher pressures. After the pump changes, less force is required on the handle.
- Except for PHD models, all other models are designed for use with single-acting cylinders and are equipped with an integral release valve.
  1. Close the release valve by turning the knob clockwise until it stops. **DO NOT OVERTIGHTEN.**
  2. Open the release valve by turning knob counter-clockwise to release the pressure and allow the oil to flow back to the reservoir



### WARNING:

- If release valve knob is difficult to turn or becomes stuck, discontinue using pump immediately. Have pump inspected and repaired by a BOSS authorised dealer.
- Check the oil level of the reservoir and add oil as necessary. See section on Maintenance.
- Replace the oil fill plug.

## Models PHD2220, PHD2350, PHD2700:

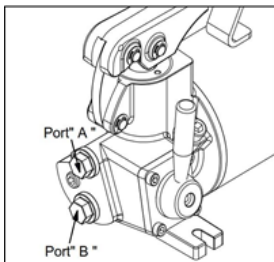
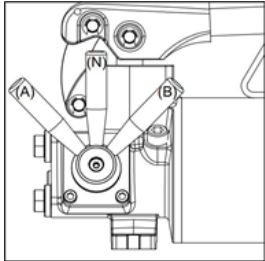
- These models are equipped with a 4-way, 3 position valves. Position the lever on 4-way valve to select functions as follows:
  - (A) Flow directed to Port “A”. Port “B” returns flow to the reservoir.
  - (N) Neutral – Ports “A” and “B” open to the reservoir.
- Loosen and remove oil fill plug to provide reservoir venting during the following steps.
- Fully close release valve.
- Position pump in the horizontal position at a higher level than the cylinder.
- Position the cylinder with the plunger end facing down. (If using a pull cylinder that the plunger end up)
- Operate the pump to extend the piston of the cylinder. (retract if using a pull cylinder)
- Open release valve to retract cylinder (extend is using a pull cylinder). This will force any air trapped in the system to the pushed back into the reservoir.
- Repeat steps 2 to 6 as needed to ensure smooth operation of the cylinder.

**Models PHD2220, PHD2350,  
PHD2700:**

- (B) Flow directed to Port “B” Port “A” returns flow to the reservoir.

**⚠ WARNING:**

- Valves do not have a load holding device. Be sure load is supported by blocking, mechanical stands or other appropriate supports before moving valve lever to the neutral (N) position.



**Air Bleeding:**

- Loosen oil plug several turns to allow reservoir venting during operation.
- Position the pump in the horizontal position at a higher level than the cylinder.
- Put cylinder in horizontal position with port facing upwards.

**Air Bleeding (cont):**

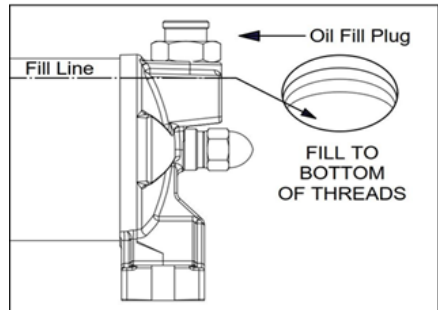
- Advance and retract the cylinder 2 to 3 times to full stroke.
- Repeat steps 2 to 4 as needed to ensure smooth operation of the cylinder.
- Check the oil level of the reservoir and add oil if necessary. See section on Maintenance.

**2. MAINTENANCE:**

**Adding Oil to the Pump:**

Check oil regularly and add oil if required. Refer to procedure below:

- Place pump in the horizontal position on a level surface.
- Remove oil fill plug from reservoir
- Check oil level (see figure below). If oil level is low, add additional oil until level is touching the bottom on the thread.
- Reinstall the oil fill plug into the reservoir. Ensure the plug is fully tightened.
- Remove air from the system if necessary and recheck the oil level.



## 2. MAINTENANCE (CONTINUED)



### IMPORTANT:

- Always add oil with the cylinders fully retracted (extended with pull Cylinders) or the pump will contain more oil than reservoir capacity.
- Do not overfill! There must be an air space in the reservoir to allow proper operation. If the reservoir contains too much oil, a vacuum will form preventing oil from flowing into the piston of the pump when operating.

**Pump oil should be changed twice a year. The following conditions require more frequent oil changes:**

- Rigorous duty, where oil may leak out or become contaminated.
- Highly humid environment and extreme changes in temperature that can result in condensation inside the reservoir.
- Dirty or dusty environments that may contaminate the oil.

### Flushing the Pump:

If you suspect your pump has been contaminated or discover sludge or other deposits on internal components, you should thoroughly flush the pump.

- Remove the old oil from the reservoir, then thoroughly clean and refill with nonflammable flushing oil.
- Reassemble the pump head to the reservoir and pump the handle approx 50 times with the release screw open.
- Empty the reservoir and refill with clean hydraulic oil (BOSS recommends and uses grade 46 oil).

### 3. TROUBLESHOOTING



#### WARNING:

- To prevent personal injury, release pump pressure and disconnect the hose from the pump before commencing repairs.

PROBLEM	CAUSE	SOLUTION
Pump loses pressure	System components leaking	Repair or replace leaking components as necessary
Pump not delivering fluid	Low oil level in reservoir	Check oil level and add oil is required
	Check ball seats are worn or damaged	Repair or replace check ball seats or replace pump body
Pump doesn't achieve rated pressure	Low oil level in reservoir	Check oil level and add oil is required
	System components leaking	Repair or replace worn or damaged components
	Fluid leaking past inlet or outlet checks	Repair inlet or outlet checks
	Piston seal leaking	Replace piston seal
	Relief valve faulty or set wrong	Replace or re adjust relief valve
Pump handle has "spongy" feel	Air trapped in system	Bleed air from system, Refer Air Bleeding
	Too much oil in reservoir	Check oil level



## 4. SPECIFICATIONS

Model	Pressure Rating (bar) 1 <sup>st</sup> Stage / 2 <sup>nd</sup> Stage	Oil Cap. (cc)	Oil Volume per Stroke (cc) 1 <sup>st</sup> Stage / 2 <sup>nd</sup> Stage	Weight (kg)
PH1035	- / 700	350	- / 3.2	5
PH1070	- / 700	700	- / 3.2	6.5
PH2035	13.8 / 700	350	7 / 1.0	5.5
PH2070	13.8 / 700	700	13 / 2.8	7.3
PH2220	27.5 / 700	2200	39.5 / 2.8	13.5
PHD2220 *	27.5 / 700	2200	35.6 / 2.8	15
PH2350	28 / 700	3500	30 / 3	16.5
PHD2350*	28 / 700	3500	30 / 3	16.8
PH2700	28 / 700	7000	113 / 4	24
PHD2700*	28 / 700	7000	113 / 4	25
PHA2035	13.8 / 700	350	12.9 / 1	2.3
PHA2100	13.8 / 700	1000	12.9 / 2.3	3.5
PHA2200	13.8 / 700	2000	12.9 / 2.3	6
PHAD2200*	13.8 / 700	2000	12.9 / 2.3	7







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