

V1.0

# 6 TON HYDRAULIC PIPE BENDER HHW-1A

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## USER MANUAL



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Please read and understand all instructions before use. Retain this manual for future reference.

## SPECIFICATIONS

Max. Bending Thickness	1.5 to 3.5 mm
Max. Bending Capacity (dia.)	1 in.
Jack Capacities	6 Tons (12,000 lb / 5,443 kg)
Dies	3/8, 1/2, 3/4 and 1 in.
Dimensions	16-7/8 x 14-7/8 x 5-1/8 in.

## INTRODUCTION

The 6 Ton Hydraulic Pipe Bender is capable of bending angles from 0° to 90° on pipes with a diameter ranging from 3/8 to 1 in. A storage case is included to easily transport the pipe bender from site to site.

## SAFETY

**WARNING! Read and understand all instructions before using this tool. The operator must follow basic precautions to reduce the risk of personal injury and/or damage to the equipment.**

Keep this manual for safety warnings, precautions, operating or inspection and maintenance instructions.

## HAZARD DEFINITIONS

Please familiarize yourself with the hazard notices found in this manual. A notice is an alert that there is a possibility of property damage, injury or death if certain instructions are not followed.

**DANGER!** This notice indicates an immediate and specific hazard that will result in severe personal injury or death if the proper precautions are not taken.

**WARNING!** This notice indicates a specific hazard or unsafe practice that could result in severe personal injury or death if the proper precautions are not taken.

**CAUTION!** This notice indicates a potentially hazardous situation that may result in minor or moderate injury if proper practices are not taken.

**NOTICE!** This notice indicates that a specific hazard or unsafe practice will result in equipment or property damage, but not personal injury.

## WORK AREA

1. Operate in a safe work environment. Keep your work area clean, well-lit and free of distractions.
2. Keep anyone not wearing the appropriate safety equipment away from the work area.
3. Store tools properly in a safe and dry location. Keep tools out of the reach of children.

## PERSONAL SAFETY

**WARNING! Wear personal protective equipment approved by the American National Standards Institute (ANSI).**

### ***PERSONAL PROTECTIVE EQUIPMENT***

1. Always wear impact safety goggles that provide front and side protection for the eyes. Eye protection equipment should comply with ANSI Z87.1 standards based on the type of work performed.
2. Wear the appropriate type of full-face shield in addition to safety goggles, as the work can create chips, abrasive or particulate matter.

3. Wear gloves that provide protection based on the work materials or to reduce the effects of tool vibration.
  - 3.1 Do not wear gloves when operating a tool that can snag the material and pull the hand into the tool.
4. Wear protective clothing designed for the work environment and tool.
5. Non-skid footwear is recommended to maintain footing and balance in the work environment.
6. Wear steel toe footwear or steel toe caps to prevent a foot injury from falling objects.

## ***PERSONAL PRECAUTIONS***

Control the tool, personal movement and the work environment to avoid personal injury or damage to the tool.

1. Do not operate any tool when tired or under the influence of drugs, alcohol or medications.
2. Avoid wearing clothes or jewelry that can become entangled with the moving parts of a tool. Keep long hair covered or bound.
3. Do not overreach when operating the tool. Proper footing and balance enables better control in unexpected situations.

## **SPECIFIC SAFETY PRECAUTIONS**

**WARNING! DO NOT let comfort or familiarity with product (gained from repeated use) replace strict adherence to the tool safety rules. If you use this tool unsafely or incorrectly, you can suffer serious personal injury.**

1. Use the correct tool for the job. This tool was designed for a specific function. Do not modify or alter this tool or use it for an unintended purpose.
2. Check the cylinder's oil level before operating the pipe bender to avoid damaging the ram mechanism.

3. The oil bolt must be loose to ventilate the tool and the release valve must be closed before proceeding to bend a pipe.
4. The outside pipe diameter must fit the bending die's groove. A mismatched may damage or shatter the pipe die when under pressure.
5. The contact surface between the tube and the two swaging blocks must be smooth. Coat swaging blocks with lubricating oil.
6. Make sure a pipe's weld seam is not at the bending point. This can damage the pipe and/or the die.
7. Excessive pressure can damage the pipe bender. Do not exceed the working pressure (see Specifications).

## INJECTION INJURY

**DANGER! Seek immediate, professional medical treatment if fluid penetrates your skin. It may feel like a pricking or sting. Do not wait for the appearance of symptoms. A toxic reaction can occur from the exposure. Delay in treatment can lead to amputation or death.**

Inform the medical staff that you have a fluid penetration injury as soon as you arrive at the medical facility. The severity of the symptoms will depend on the type of fluid injected. Bring the Safety Data Sheet for the fluid with you to the medical facility if possible.

## INJECTION PRECAUTIONS

Fluid can penetrate the skin at 100 PSI pressure. Fluid escaping under pressure from the tool has sufficient force to penetrate your clothing and skin. Follow the precautions below to avoid an injection injury.

1. Always check for leaks wearing a face shield, safety goggles, rubberized gloves and protective clothes.
2. Release all pressure from the system before you inspect it.

3. Do not use your hands to detect a fluid leak. Use a large piece of wood, cardboard or paper and watch for discolouration.
4. Replace damaged parts with identical manufacturer's components to ensure it is rated to handle the pressure.

## HYDRAULIC PRECAUTIONS

**DANGER! Seek immediate medical attention if hydraulic fluid under pressure penetrates your skin. See Injection Injury precautions for instructions before using a pressurized hydraulic system.**

1. Do not touch or handle hydraulic hoses or components while under pressure. Hydraulic fluid escaping under pressure has sufficient force to penetrate your clothing and skin. A pinpoint hole may inject hydraulic fluid into your body. Seek immediate medical attention if this occurs (see Injection Injury).
2. Never exceed the hydraulic system's load capacity (see Specifications).
3. Do not adjust the hydraulic system's relief setting. The settings are preset by the factory.
4. Hydraulic oil under pressure is hot and can cause a burn injury if touched, sprayed or spilled. Allow the hydraulic system to cool before conducting maintenance.
5. Hydraulic components require regular inspection. Release all pressure from the system before you inspect it. Replace damaged hydraulic parts with identical manufacturer's components.
6. Do not attempt makeshift repairs to a hydraulic system. Such repairs can fail suddenly and create a hazardous condition.
7. Hydraulic fluid has a combustible flash point of 200°F (93°F). Do not expose the fluid to an ignition source.
8. Change your clothing immediately if sprayed with hydraulic fluid. Store clothing or rags contaminated with hydraulic fluid in an approved metal safety can with a spring-closing lid and venting designed to contain a fire.

9. Only use hydraulic fluid in the pump. Do not substitute or mix brake fluid, or any other fluid, with the hydraulic fluid. This can result in a pump failure and injure the user or bystander. It may also damage the pump.

## UNPACKING

**WARNING! Do not operate the tool if any part is missing. Replace the missing part before operating. Failure to do so could result in a malfunction and personal injury.**

Remove the parts and accessories from the packaging and inspect for damage. Make sure that all items in the parts list are included.

Contents:

- Pipe Bender
- Bending Dies, 4 pieces
- Storage Case

## OPERATION

Numbered references in parenthesis (#1) refer to the included Parts List.

1. Place the pipe bender on a flat surface that can support the tool.
2. Lift the upper plate (#6) and remove the swaging blocks (#7).
3. Choose the swaging blocks of the correct size and drop into the correct lower plate (#9) openings based on the pipe diameter and length.
4. Close the upper plate, aligning the swaging blocks with the correct holes.
5. Close the pipe bender release valve (#2) to allow hydraulic pressure to build during pumping. Loosen the oil bolt (#3).
6. Select the correct size bending die and install on the ram (#12).

- 6.1 Using a mismatched die size for the pipe can result in a misshapen bend.
7. Lubricate the rollers and dies where it will touch the pipe with a little oil.
8. Pump the handle (#5) to advance the die towards the front, stopping short to allow insertion of the pipe.
9. Insert a length of pipe into between the rollers and die.
  - 9.1 A pipe's seam should not face the die directly.
  - 9.2 Adjust the rollers so the pipe is resting in the notches.
10. Advance the die until the pipe is held in place by pressure. Check the alignment again.
11. Pump the handle and apply slow gradual pressure to the pipe until it has reached the correct bend angle.
  - 11.1 The swaging blocks should rotate to keep the pipe in the notches. Stop if one of the rollers is not rotating. Release pressure and oil the contact points with the plates.
12. Release pressure by opening the release valve (#2) while holding the pipe. The ram will retract automatically and release the pipe.
13. Open the release valve and close the oil bolt (#3) when work is complete.

## **CARE & MAINTENANCE**

1. Maintain the tool with care. A tool in good condition is efficient, easier to control and will have fewer problems.
2. Inspect the tool components periodically. Repair or replace damaged or worn components. Only use identical replacement parts when servicing.
3. Follow instructions for lubricating and changing accessories.
4. Only use accessories intended for use with this tool.



5. Keep the tool handles clean, dry and free from oil/grease at all times.
6. Maintain the tool's labels and name plates. These carry important information. If unreadable or missing, contact Princess Auto Ltd. for replacements.

**WARNING! Only qualified service personnel should repair the tool. An improperly repaired tool may present a hazard to the user and/or others.**

## BLEEDING THE HYDRAULIC SYSTEM

Bleed excess air from the hydraulic system as follows:

1. Open the release valve (#2) by turning it counterclockwise.
2. Remove the oil filler plug and fill the pump with hydraulic fluid to full level.
3. Pump several full strokes to eliminate any air in the system.
4. Check the oil filler hole and, if necessary, top off the oil filler hole with hydraulic oil.
  - 4.1 Do not add too much or too little. Too much oil will force the excess oil to leak from the cylinder seals and possible damage them. Not enough oil will cause a loss of power as air is sucked in, causing a drop in pressure.
5. Replace the oil filler plug and close the release valve.
6. Test the ram several times for proper operation before putting it into use. If, after bleeding, the ram still does not appear to be working properly, do not use the ram until a qualified service technician has repaired it.

## LUBRICATION

Inspect and lubricate the tool when required. Only use light oil to lubricate the tool. Other lubricants may not be suitable and could damage the tool or cause a malfunction during use.

## STORAGE

When not in use for an extended period, apply a thin coat of lubricant to the steel parts to avoid rust. Remove the lubricant before using the tool again.

## DISPOSAL

Recycle a tool damaged beyond repair at the appropriate facility.

Contact your local municipality for a list of disposal facilities or by-laws for electronic devices, batteries, oil or other toxic liquids.

**IMPORTANT! DO NOT pollute the environment by allowing uncontrolled discharge of waste oil.**

## DISPOSAL - HYDRAULIC FLUID

Do not drain hydraulic oil into the sewer system or dispose in an uncontrolled location. Hydraulic fluid may take more than a year to breakdown in the environment and the ingredients may still be toxic. Contact your local municipality for proper disposal instructions or locations.

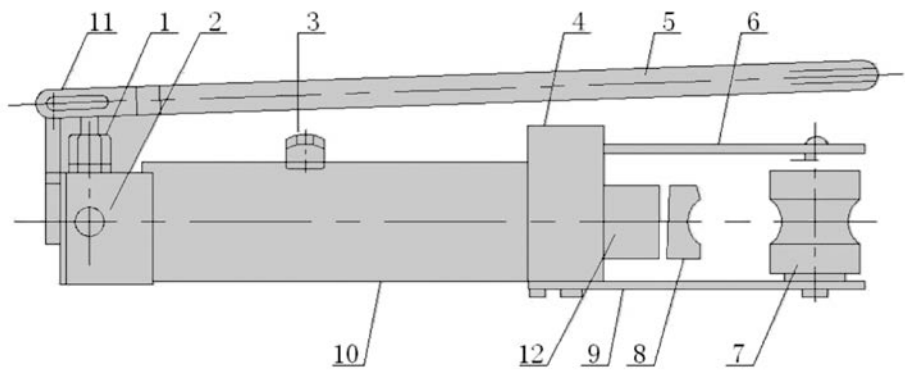
## TROUBLESHOOTING

Visit an authorised location for a solution if the tool does not function properly or parts are missing. If unable to do so, have a qualified technician service the tool.

PROBLEM(S)	POSSIBLE CAUSE(S)	SUGGESTED SOLUTION(S)
The ram moves unsteadily after extending it to a certain length.	<ol style="list-style-type: none"> <li>1. The oil bolt is not loose.</li> <li>2. The pump's oil outlet valve is not sealed.</li> <li>3. The oil outlet valve's steel ball is misshapen and cannot form a seal.</li> </ol>	<ol style="list-style-type: none"> <li>1. Loosen the oil bolt.</li> <li>2. Replace the oil seal.</li> <li>3. Replace the steel ball.</li> </ol>

<b>PROBLEM(S)</b>	<b>POSSIBLE CAUSE(S)</b>	<b>SUGGESTED SOLUTION(S)</b>
Oil leaking from the end of the ram.	The seal rings are damaged.	Replace the seal rings.
Oil leaking from the release valve	The inner pressure ring is loose or damaged.	Dismantle the limit screw and release valve. Tighten the pressure ring.
Ram's pushing force is weak.	<ol style="list-style-type: none"> <li>1. The steel ball in the release valve does not create a seal.</li> <li>2. The steel ball in the release valve is loose or has fallen out.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace the steel ball.</li> <li>2. Tighten the release valve or replace the steel ball at the top of the release valve.</li> </ol>
Oil leakage appears at the top the ram.	The ram's seal ring is damaged.	Replace the o-ring.
Insufficient oil suction from the while pumping the handle.	<ol style="list-style-type: none"> <li>1. Oil is low</li> <li>2. Oil is dirty.</li> </ol>	<ol style="list-style-type: none"> <li>1. Top up hydraulic oil.</li> <li>2. Drain and replace hydraulic oil.</li> </ol>
Die is cracked or damaged.	<ol style="list-style-type: none"> <li>1. Load on the die is one sided due to stuck swaging block.</li> <li>2. Previously bent pipe is inserted into die, but is misaligned, causing a one-sided load.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check if the positions of the two swaging blocks are the same. Put some oil to the touching surfaces of swaging blocks and the pipe.</li> <li>2. Check the alignment before applying pressure.</li> </ol>
Abnormal withdrawal of the ram.	The outlet valve's steel ball cannot reset.	Pump the handle to extend the ram. Keep pressure once extended and strike the handle seat (#11) with a hammer several times, to rest the steel ball.

# PARTS BREAKDOWN



## PARTS LIST

#	DESCRIPTION
1	Piston Pump
2	Release Valve
3	Oil Bolt
4	Oil Pump Seat
5	Handle
6	Upper Plate
7	Swaging Blocks
8	Bending Dies
9	Lower Plate
10	Bracket
11	Handle Seat
12	Ram