

This 'Original instructions' document assumes that the operator carrying out any operation with this product is trained and competent to do so. This manual does not attempt to cover all details or variations in the equipment. Nor does this manual claim to provide for every possible contingency met in connection with the installation, operation, or maintenance thereof. Should further information be desired, or should a particular problem arise which is not covered in sufficient detail, the matter should be referred to Hi-Force.

OPERATING INSTRUCTION MANUAL

HP-MANUALLY OPERATED HYDRAULIC PUMP - STEEL



Hi-Force HP-Manually Operated Hydraulic Pumps (Steel) are designed to operate single-acting hydraulic cylinders and tools with a maximum working pressure of 700 bar (10,000 psi) This manual applies to the Hi-Force HP-Manually Operated Hydraulic Pumps (Steel) ONLY. It contains the latest product information available at the time of publication and approval. For information relating to the servicing of HP-Manually operated hydraulic pump, see the servicing instructions, which are available on the Hi-Force website. Hi-Force reserves the right to make changes to this document at any time without notice.

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NOTE: Images contained within this document are for illustrative purposes **ONLY**.

1.0 Inspection upon Receipt

Upon receipt of the product, visually inspect the item for any evidence of shipping damage. Please note: the warranty does not cover shipping damage. Notify the courier immediately if shipping damage is found and refrain from putting the product into service. The carrier is responsible for repair and replacement costs resulting from damage that occurred in transit.

2.0 Safety Precautions

2.1 Introduction



Read and follow all the instructions and safety warnings carefully before handling, installation or use of any hydraulic equipment. Failure to do so could lead to equipment damage, equipment failure, personal injury or even death. Hi-Force will not be held responsible for any damage to the equipment, injury or death resulting from the unsafe use of, lack of maintenance to, or incorrect operation of the product. If in doubt on the correct use of any Hi-Force equipment, contact your nearest Hi-Force office or distributor. Only qualified personnel should be allowed to operate hydraulic equipment. If an operator has not been trained on high-pressure hydraulic equipment and its safe usage, consult your local Hi-Force sales office or distributor who can offer training courses for operators.

2.2 Work Area Safety

- Keep work areas clean and well lit. Cluttered spaces and inadequate lighting can result in unnecessary accidents.
- Keep bystanders clear of any hydraulic tool activity. People working in close-range should be made aware of high-pressure work before commencing.

2.3 General Hydraulic System Safety Precautions

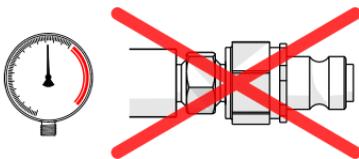


WARNING! Failure to observe and obey the following safety precautions could result in property damage, significant personal injury or death;



- When operating any hydraulic equipment, all operators should ensure that all necessary personal protective equipment (PPE) is worn, as specified by their employer. Steel toe-cap safety shoes, safety glasses/visor, and protective gloves should be worn at all times. All relevant risk assessments should be completed before the use of the equipment.
- Keep hydraulic equipment away from open flames and direct heat.
- **NEVER** use a coupler as a tool handle, especially if the system is pressurised.

- **NEVER** handle a pressurised hydraulic hose. Hydraulic fluid escaping under pressure from a ruptured hose can penetrate the skin and lead to a significant medical emergency, and in some cases, death. Should this incident occur, seek out medical attention immediately.
- Seek medical attention immediately if a hydraulic injection injury (no matter how minor) occurs.
- The system operating pressure **MUST NOT** exceed the pressure rating of the lowest-rated component in the system. It is good practice to use a pressure gauge to monitor the entire system.
- **NEVER** attempt to pressurise a system that is not correctly coupled to its operational pump.



- **NEVER** pressurise an unconnected male coupler/s.

- **NEVER** attempt to disconnect a hose from a hydraulic system until the system's pressure has been completely released. Doing so can result in that pressure becoming trapped within the system and relieving trapped pressure can be dangerous.
- **NEVER** try to relieve trapped hydraulic pressure in the system by loosening or attempting to remove the coupler. Trapped hydraulic pressure can cause a loosened coupler to dislodge unexpectedly with great force. This action could result in serious personal injury or death.
- Loosening a coupler under pressure can result in the escape of hydraulic fluid at high pressure, which can penetrate the skin and cause significant injury or death.
- **NEVER** use a hammer and punch to unseat a coupler check valve that is under pressure. Doing so could result in the sudden, uncontrolled release of hydraulic fluid at high pressure, which could cause significant injury or death.
- **NEVER** attempt to solve, or clean-up leaks in the system while the system is pressurised.
- Immediately replace any worn or damaged parts using genuine Hi-Force parts only.
- Do not use any hydraulic equipment if you are under the influence of alcohol, drugs or medication. Lack of attention whilst operating high-pressure hydraulic tools can result in personal injury or death.



CAUTION!

Failure to observe and obey the following safety precautions could result in property damage, equipment damage or minor/moderate personal injury;

- **NEVER** lift, carry or move any hydraulic components by the hose or hoses connected to them.
- Avoid damaging hydraulic hoses. **ALWAYS** route hoses to ensure that they are free from sharp bends and kinks. Using a sharply bent or kinked hose will result in severe back-pressure, which can lead to hose failure.
- **NEVER** use a coupler/s to lift, carry or position a tool.

- Servicing of hydraulic equipment must only be undertaken by a qualified technician.



- **DO NOT** drop or place heavy objects on a hydraulic hose, as this may cause internal damage, which could result in rupture of the pressurised hose. A ruptured hose could cause significant damage to components and possible severe injury to personal operating nearby.
- **DO NOT** let familiarity gained with any hydraulic tools allow you to become complacent. Complacency with any tooling can result in a lack of discipline toward working guidelines and safety principles.
- **DO NOT** remove any labels from the product. Replace any damaged or unreadable labels immediately.
- Avoid loose clothing and jewellery that could get caught in moving parts, tie back long hair.

2.4 Hydraulic Pump Specific Safety Precautions



WARNING! Failure to observe and obey the following safety precautions could result in property damage, serious personal injury or death;

- **NEVER** invert the pump or lay it on its side, either in use, in transport or in storage.
- **DO NOT** weld any items to the pump or modify it in any way from its delivered condition. Your warranty may be invalidated, and it could lead to serious personal injury.
- **NEVER** exceed the maximum rated capacity of any hydraulic pump/circuit. See Section 4.1 for model-specific pressure capacity ratings.
- **DO NOT** overload hydraulic systems. The pump relief valve only protects against overloading of the pump. It does not protect against overloading of the system.



CAUTION! Failure to observe and obey the following safety precautions could result in property damage, equipment damage or minor/moderate personal injury;

- **ALWAYS** stand the pump on a stable, level surface during operation.
- To protect your warranty, only use the hydraulic oil grade specified in Section 6.2.

3.0 Declaration of Incorporation/Conformity

Hi-Force declares that this product has been tested and complies with the standards and declarations as set out in the Declaration of Incorporation/Conformity (DoI/DoC). The DoI/DoC is included as Annex A to this instruction document and is supplied with all shipments of this product.

4.0 Oil Specification

Hi-Force tools will use 1 of 2 grades of oil, dependant on the tool. The tools are designed to operate at temperatures between -20°C and 80°C. Details of the oil used in this product can be found in, Section 6.2

ISO Hydraulic Oil Grade	Temperature Range: Degrees Celcius (°C)	
	From:	To:
ISO15	-23	44
ISO46	-2	73

4.1 HP-Steel Specifications

Refer to the nameplate on the pump for identification.

Model Number	Valve Type	Displacement per stroke (cm ³)		Usable Oil Capacity (litres)	Handle Effort (kg)	Weight (kg)
		1 st stage	2 nd stage			
Single stage pumps for single acting cylinders and tools.						
HP110	2-way	2.9	-	1.0	45	5.6
Two stage pumps for single acting cylinders and tools.						
HP227	2-way	12.9	2.3	2.3	38	10.5
HP257	2-way	12.9	2.3	4.1	38	15.2
HP227FP*	2-way	12.9	2.3	2.3	38	10.5
HP227FPC**	2-way	12.9	2.3	4.1	38	15.2

*HP227FP comes with a foot operated handle.

**HP227FPC Comes with a foot operated handle, pressure gauge, gauge mounting block and 3 meter hoses with male coupler.

5.0 Component Identification

1	Oil Reservoir	5	Filler Cap (dipstick attached)
2	Handle	6	Outlet Port 3/8 NPT
3	Transit plug	7	Release Valve
4	Breather	8	Identification plate

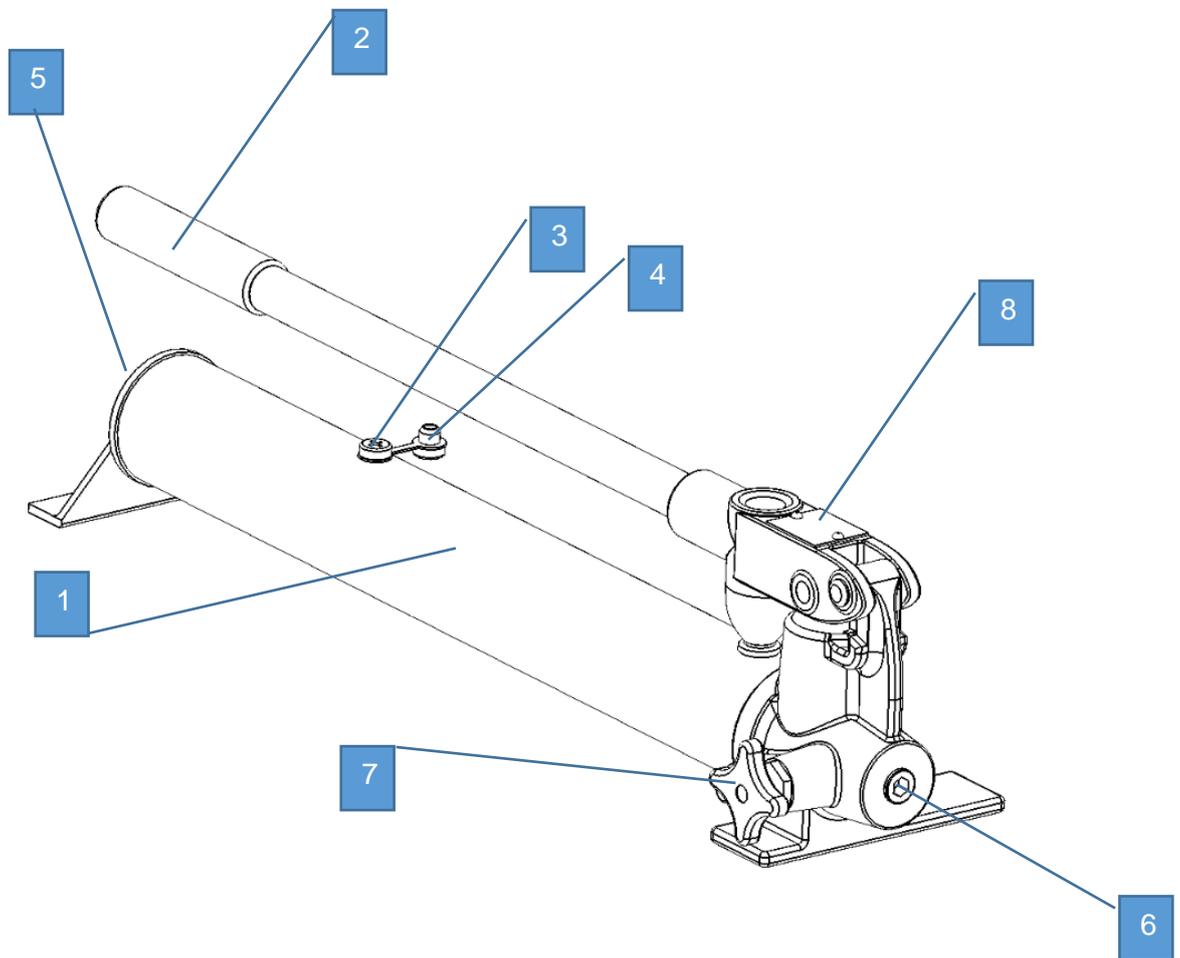


Figure 5.1: Component Identification (HP110 Model shown)

6.0 Installation/Setup

6.1 Before First Use / Preparation

- Check for any signs of wear in the pump or connected components.
- Unscrew the transit plug (3) and fit the breather (4) this will maximise the oil volume available and prevent oil reservoir pressure build up.

6.2 Filling the Pump with Fluid - ISO15 grade.

IMPORTANT: Only add fluid to the reservoir when the connected system is fully de-pressurised and returned to its closed position. Failure to do so will result in the system containing more fluid than the reservoir can hold.

Fill/top-up the pump as follows: **HP110**

- Stand the pump Head down on a firm, level surface.
- Remove the filler cap (5) from the reservoir.
- Fill the reservoir with clean, high quality ISO15 hydraulic oil, leaving a small air space of approximately 1-2cm between the top of the fluid and the filler plug.
- Replace the filler cap (5).

Fill/top-up the pump as follows: **HP227/HP257**

- Stand the pump on a firm, level surface.
- Remove the transit plug/breather (3/4) from the reservoir.
- Fill the reservoir with clean, high quality ISO15 hydraulic oil, leaving a small air space of approximately 1-2cm between the top of the fluid and the filler plug.
- Replace the transit plug/breather (3/4).

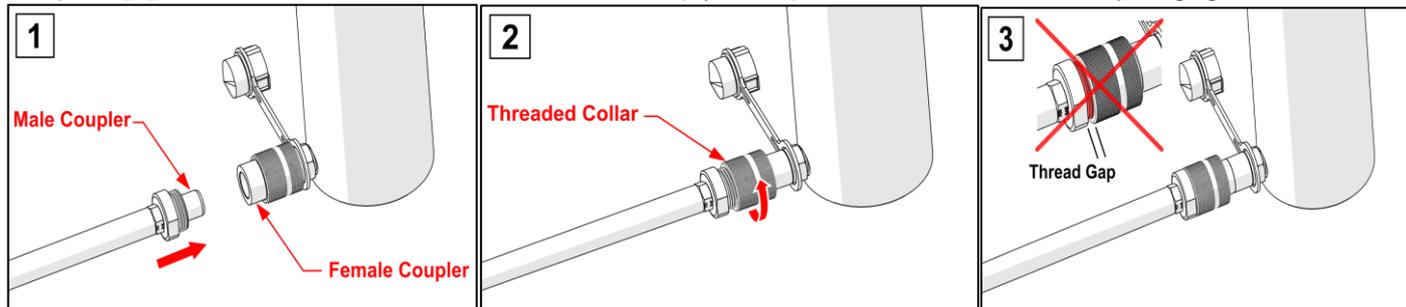
6.3 Hydraulic Connections

Remove the hexagon headed plug and make a hydraulic connection to the outlet port (6). This port has a 3/8" NPT female thread, and the connection should be sealed, as appropriate, with a suitable thread sealant.

⚠ WARNING! **DO NOT** overtighten this fitting. It can cause damage to the pump head or lead to failure of the fitting at below rated pressure.

When making a connection between two couplers, ensure that these connections are fully connected, with no thread gap and hand tight only.

To do so: Ensure that all threads are clean with no damage [1] Press the male coupler into the female coupler, [2] then turn the threaded-collar clockwise (by hand) until the threads are fully engaged.



IMPORTANT: Make sure that all coupler threads are fully engaged.

⚠ WARNING! Only use hoses with a 4:1 safety rating on burst pressure.

6.4 Bleeding Trapped Air from the Hydraulic System

⚠ WARNING! The bleeding of trapped air from a hydraulic system must only be performed by qualified personnel who have been trained and are competent to do so.

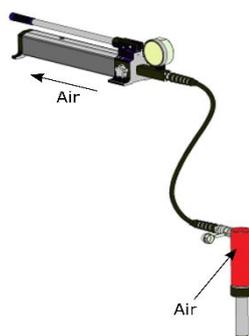
The method of air removal will depend on the hydraulic system under test. Safe, effective methods of air removal, must be established before starting any operation. Pressure testing with air trapped in the hydraulic system can lead to an increased risk to the equipment and the operator.

NOTE: To reduce the likelihood of introducing air into the hydraulic system, make sure that all hoses are pre-filled with fluid before connecting them to the hydraulic system.

Cylinder and hoses are not always completely filled with oil when new. For safe and efficient operation, trapped air must be removed from the system. The following procedure must be carried out with the cylinder/s connected to the pump, but not operating under load.

To remove air from the system, proceed as detailed below:

- Make sure the pumps oil filler breather cap is fitted. (if applicable)
- With all hydraulic connections made, position the cylinder/s below the level of the hydraulic pump, as illustrated in figure 5.2.



Using the pump, fully advance and retract the cylinder/tool piston several times until the operation is smooth. (Refer to the pumps operating manual for details of pump operation).

Figure 5.2

7.0 Operation

Hi-Force will not always be aware of what equipment this pump will be used with. It is the responsibility of the owner and all operators to read, understand and comply with all appropriate safety warnings and operating instructions relating to the equipment used.

NOTE: Every pump is factory-fitted with an adjustable pressure relief valve. The valve is factory set to the maximum working pressure of the pump model specified.

This valve can be adjusted by the customer, to any desired pressure within the rating of the pump. Details for the method of adjustment for this valve are available on request.

⚠ WARNING! **NEVER** set the pressure relief valve above the rated maximum working pressure of the pump (as displayed on the specification plate) or above the maximum pressure for the system.

IMPORTANT: Before use, make sure the reservoir has sufficient capacity for the required operation.

⚠ CAUTION! Make sure the fluid level does not drop below the minimum operating level, as this may cause air to be pumped into the system. Fluid levels can be checked using the dipstick attached to the reservoir filler cap (4).

- Turn the pressure release valve (7) clockwise to close it. (See figure 5.1)
- Pressurise the system by operating the pump handle (2) (See figure 5.1)

⚠ CAUTION! Only use the pump handle supplied. **DO NOT** use handle extensions.

⚠ CAUTION! **NEVER** jerk the handle during operation. This makes the pump inefficient and can cause unexpected over pressurisation. A smooth, steady action produces the best results and will reduce operator fatigue.

- Release the system pressure by slowly opening the pressure release valve (7) anti-clockwise. (See figure 5.1)

IMPORTANT: After operation, fully return all hydraulic fluid to the pump. Monitor the hydraulic fluid level in the reservoir to prevent over-filling of the tank.

8.0 Maintenance and Storage

- Inspect the pump for damage before and after each use.
- Keep hydraulic fluid clean. Change as necessary.
- Keep contaminants from entering the system, by fitting dust caps to couplers and blanking off open ports.
- Zero the pump pressure before storing.
- Have the pump serviced regularly, by a Hi-Force authorised repair centre.
- Replace the transit plug to prevent the entry of moisture and/or dirt into the oil. This will also prevent any accidental environmental spillage.

9.0 Troubleshooting

Hi-Force HP manually operated hydraulic pumps should be serviced and repaired only by authorised Hi-Force repair centres. The following table gives possible causes and solutions for common problems.

TROUBLESHOOTING GUIDE		
Problem	Possible Cause	Solution
1. No delivery of operating fluid.	a. No oil in the reservoir.	Fill reservoir as per section 5.2
	b. Suction valve not seating.	Remove contaminants or have steel balls replaced.
	c. Relief valve sticking or not sealing.	Contact your local Hi-force distributor.
	d. Delivery valve failure.	Have steel balls replaced.
2. Handle drops rapidly on its own.	a. Suction ball not sealing correctly.	With the release valve open, pump fluid around the pump. This may dislodge the dirt. If this does not work, contact your local Hi-Force office / distributor.
3. Handle rises as pressure drops.	a. Delivery valve not sealing correctly.	With the release valve open, pump fluid around the pump. This may dislodge the dirt. If this does not work, contact your local Hi-Force office / distributor.
4. Handle is hard to pump in low pressure. HP227/HP257 only	a. The low pressure relief valve is set been adjusted to high.	Contact your local Hi-Force office / distributor.
5. Loss of effective pumping stroke, and/or high-pressure building.	a. Air trapped in the pump.	Follow bleeding procedure as per section 5.4
6. erratic pressure reading on gauge and/or slight over-pressurisation	a. Uncontrolled use of the pump handle.	Follow operation guidance notes in section 6. If this does not work, contact your local Hi-Force office / distributor.

UK Head Office:

Hi-Force Limited
Prospect Way, Daventry, Northamptonshire
NN11 8PL
United Kingdom

Tel: + 44 1327 301000

Fax: + 44 1327 706555

Email: daventry@hi-force.com

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www.hi-force.com

Hi-Force Global offices: **www.hi-force.com/en-uk/hi-force-offices**