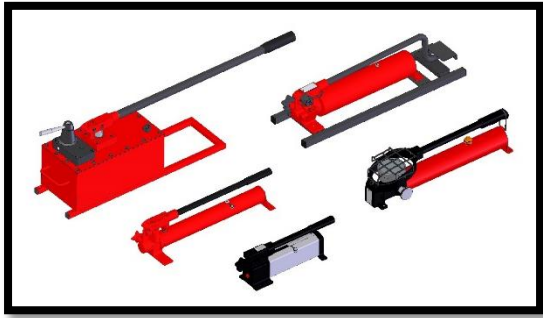


Hi-Force® HYDRAULIC TOOLS

INSTRUCTION MANUAL – HYDRAULIC HAND PUMPS: Model Series: HP110, HP227-257, HP211-252D, HPX1500-2800



NOTE: Spare parts sheets for these products are available from the Hi-Force website at:

www.hi-force.com

or from your local regional Hi-Force Sales office or authorized local Hi-Force distributor.

1.0 Inspection of the product upon receipt:

On receipt of the product, visually inspect the item for any evidence of shipping damage. Please note shipping damage is not covered by warranty. If shipping damage is found notify the carrier immediately and refrain from putting the product into service. The carrier is responsible for repair and replacement costs resulting from damage in transit shipment.

2.0 Safety Precautions:



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



All operators should ensure that all necessary personal protective equipment as specified by their employer is worn when operating any hydraulic equipment. Safety shoes, safety glasses/ visor and protective gloves should be worn at all times. All relevant risk assessments should be completed prior to use of the equipment



Warning: All ancillary equipment to be used with these ranges of hydraulic manual pumps **MUST** be rated for use at the same operating pressure as the pump model to be used:-

HP110 – 700bar (10,000psi)

HP227 – HP257 – 700 bar (10,000psi)

HP211, HP212, HP232, HP252–700 bar (10,000psi)

HP232D, HP252D – 700 bar (10,000 psi)

HP245 – HP245D – 700 bar (10,000 psi)

HPX1500 – 1500 bar (21,755 psi)

HPX2800 – 2800 bar (40,610 psi)



Sufficient time should be allocated to planning your hydraulic system. Make sure that all the components are fit for the intended use.



Ensure there is sufficient oil capacity in the pump reservoir to fully operate the system to be used.



DO NOT exceed the rated pressure of the pump or the rated capacity of the system to be used. Under no circumstances ever tamper with the internal safety relief valve of the pump.



Keep hydraulic pumps away from flames and direct heat.

Hydraulic pumps must only be serviced by a qualified technician.

To protect your warranty, only use Hi-Force's hydraulic oil.

Immediately replace any worn or damaged parts using genuine Hi-Force parts only.

The system operating pressure must not exceed the pressure rating of the lowest component in the system. Where possible, use a pressure gauge to monitor the system.

Avoid damaging hydraulic hose. Always route hoses to ensure that they are free from sharp bends and kinks. Using a bent or kinked hose will cause severe back-pressure and can also lead to the failure of the hose.



Never lift or carry any hydraulic components by the hose or hoses connected to them.

Do not handle a pressurized hydraulic hose. Oil escaping under pressure from a ruptured hose can penetrate the skin and lead to a serious medical emergency and in certain cases death. Should this incident happen medical attention must be sought immediately.

Always operate the system under no load condition prior to the actual lift to ensure that no air is trapped in the hydraulic circuit.

Do not drop or place heavy objects on a hydraulic hose as this will cause internal damage to the hose which could result in rupture when the hose is pressurized and could result in serious damage to components, and possible serious personal injury to operating personnel.

3.0 General Information:

HP110 – Single Speed Manual Operation Steel Construction Pump – Displacement: 2.9 cm³ per stroke- 700 bar maximum working pressure.

HP227, HP257 – Two Speed Manual Operation Steel Construction Pump – Displacement: 1st Stage 12.9 cm³: 2nd Stage 2.3 cm³ - 700 bar maximum working pressure.

HP245, HP245D – Two Speed Manual Operation Steel Construction Pump – Displacement: 1st Stage 113 cm³: 2nd Stage 4 cm³ - 700 bar maximum working pressure.

HP211 – Two Speed Manual Operation Aluminium Construction Pump – Displacement: 1st Stage 12.9 cm³: 2nd Stage 1 cm³ - 700 bar maximum working pressure.

HP212, HP232/D, HP252/D – Two Speed Manual Operation Aluminium Construction Pump – Displacement: 1st Stage 12.9 cm³: 2nd Stage 2.3 cm³ - 700 bar maximum working pressure

HPX1500 – Two Speed Manual Operation Steel Construction Pump – Displacement: 1st Stage 20 cm³: 2nd Stage 1 cm³ - 1500 bar maximum working pressure

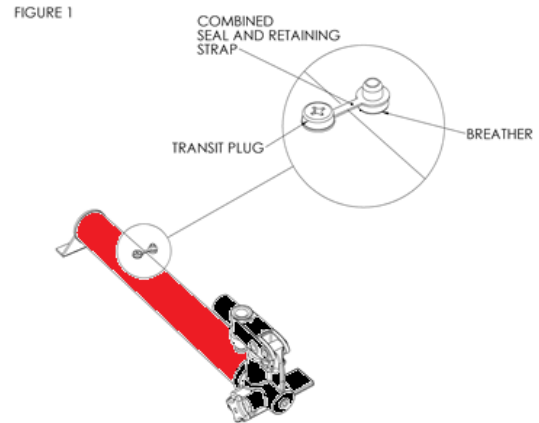
HPX2800 – Two Speed Manual Operation Steel Construction Pump – Displacement: 1st Stage 20 cm³: 2nd Stage 0.8 cm³ - 2800 bar maximum working pressure

4.0 Description:

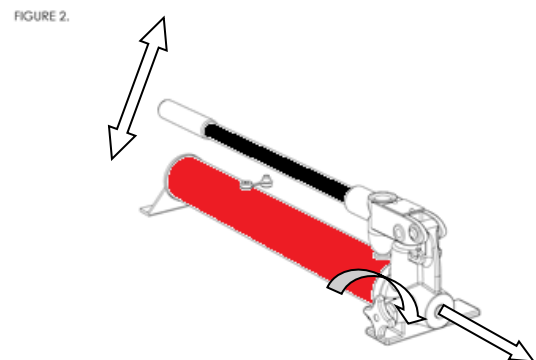
HP110:

1. The pump may be used either horizontally or vertically with the hose end downwards. The pump is equipped with a pressure relief valve factory set at the maximum operating pressure. Before use unscrew

transit plug and replace with breather on the top of the tank. This will maximise the oil volume available. See Figure 1.

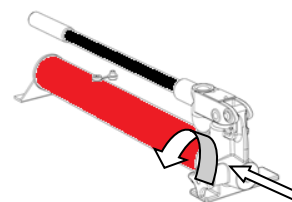


2. To advance the cylinder, turn the release knob clockwise. Operate pump handle. See Figure 2



3. **Note: The cylinder will automatically be held in the advance position and will not retract of its own accord.**
4. To retract the cylinder turn release knob anti-clockwise slowly, ensuring that the cylinder does not retract too fast as to make the operation unsafe. See Figure 3.

FIGURE 3.



Hi-Force® HYDRAULIC TOOLS

INSTRUCTION MANUAL – HYDRAULIC HAND PUMPS: Model Series: HP110, HP227-257, HP211-252D, HPX1500-2800

5. If pump is to be transported after use, replace the transit plug in tank.

WARNING: DO NOT RELY ON THE PUMP VALVE FOR POSITIVE LOAD HOLDING. IF IT IS REQUIRED TO LOCK THE LOAD IN POSITION USE A MANUAL SHUT OFF VALVE IN THE CIRCUIT. NEVER WORK UNDER A LOAD SUPPORTED ONLY BY HYDRAULIC MEANS.

FILLING WITH OIL.

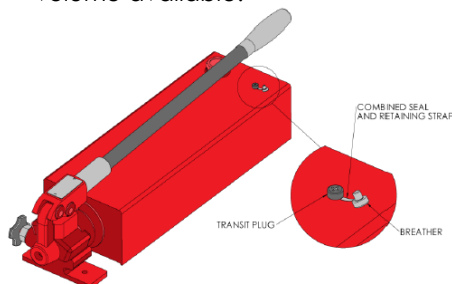
Ensure cylinder is full retracted.

HP110: Position pump vertically with pump head downwards. Remove central plug on rear of pump and check oil level using dipstick fitted to plug.

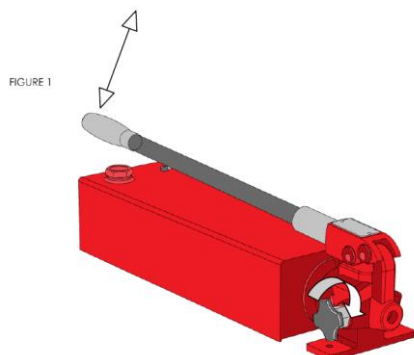
Use only Hi-Force HF032 oil.

HP227/HP257

- 1) The pump may be used either horizontally or vertically with the hose end downwards. The pump is equipped with a pressure relief valve factory set at the maximum operating pressure. Before use unscrew transit plug and replace with breather on the top of the tank. This will maximise the oil volume available.



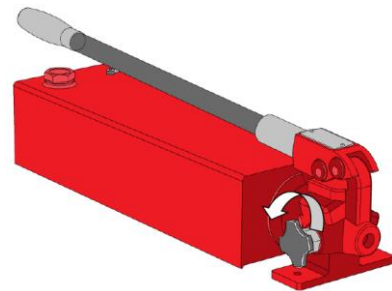
- 2) To advance the cylinder, turn the release knob clockwise. Operate pump handle. The pump will automatically switch from low pressure (high flow) operation to high pressure (low flow) as the pressure increases. See Figure 1. (HP257 used in diagrams).



Note: The cylinder will automatically be held in the advance position and will not retract of its own accord.

- 3) To retract the cylinder turn release knob anti-clockwise slowly, ensuring that the cylinder does not retract too fast as to make the operation unsafe. See Figure 2

FIGURE 2.



- 4) If pump is to be transported after use, replace the transit plug in tank.

WARNING: DO NOT RELY ON THE PUMP VALVE FOR POSITIVE LOAD HOLDING. IF IT IS REQUIRED TO LOCK THE LOAD IN POSITION USE A MANUAL SHUT OFF VALVE IN THE CIRCUIT. NEVER WORK UNDER A LOAD SUPPORTED ONLY BY HYDRAULIC MEANS.

HP211, HP212, HP232, HP252.

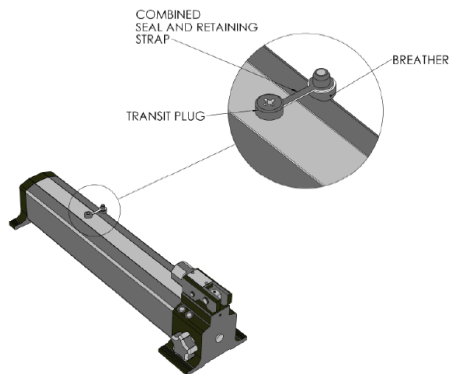
The HP211, HP212, HP227, HP232 and HP252 two speed hand pumps are manually operated hand pumps suitable for a wide range of applications. All models are supplied complete, with a pre-filled oil reservoir ready for immediate use. All models feature low handle effort characteristics for easy operation and lightweight design and are of strong durable construction. All 4 pumps have a max working pressure of 700 bar and are of Aluminium construction.

- 1) The pump may be used either horizontally or vertically with the hose end downwards. The pump is equipped with a pressure relief valve factory set at the maximum operating pressure. Before use unscrew transit plug and replace with breather on the top of the tank. This will maximise the oil volume available

Hi-Force® HYDRAULIC TOOLS

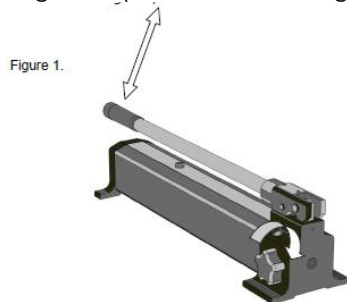
INSTRUCTION MANUAL – HYDRAULIC HAND PUMPS:

Model Series: HP110, HP227-257, HP211-252D, HPX1500-2800



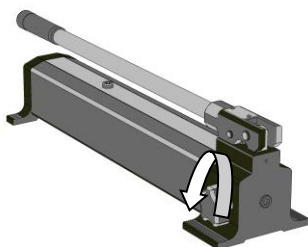
- 2) To advance the cylinder, turn the release knob clockwise. Operate pump handle. The pump will automatically switch from low pressure (high flow) operation to high pressure (low flow) as the pressure increases.

See Figure 1. (HP232 used in diagrams).



Note: The cylinder will automatically be held in the advance position and will not retract of its own accord.

- 3) To retract the cylinder turn the release knob anti-clockwise slowly, ensuring that the cylinder does not retract too fast as to make the operation unsafe. See Figure 2. below



- 4) If the pump is to be transported after use, always re-fit the transit plug in the tank.

WARNING: DO NOT RELY ON THE PUMP VALVE FOR POSITIVE LOAD HOLDING. IF IT IS REQUIRED TO LOCK THE LOAD IN POSITION USE A MANUAL SHUT OFF VALVE IN THE CIRCUIT. NEVER WORK UNDER A LOAD SUPPORTED ONLY BY HYDRAULIC MEANS.

FILLING WITH OIL

Ensure cylinder is full retracted.

HP211/HP212/ HP232/ HP252: Position pump horizontal on a flat surface remove plug on the top of the tank and check oil level with dipstick on plug.

Use only **Hi-Force HF032 or HFO46** oil only.

BLEEDING THE HYDRAULIC SYSTEM

Connect a cylinder to the pump. Position the cylinder below the level of the pump with its pressure ports uppermost. Ensure the bleed screw on the pump is open. Operate the cylinder 3-4 times over its full stroke and all air should be forced back to the pump reservoir.

Warning: when using a small cylinder with long hoses it is possible that air can remain trapped in the hose if the volume of the hose is greater than the volume of the cylinder. In this case the bleeding must be carried out using a shorter hose before use.

See Figure 3. Below;

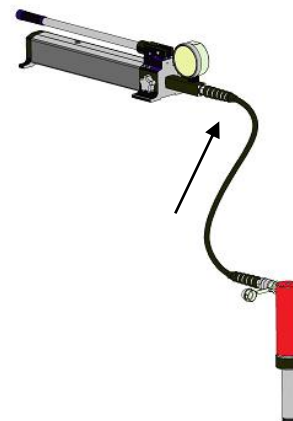


Figure 3:

Hi-Force® HYDRAULIC TOOLS

INSTRUCTION MANUAL – HYDRAULIC HAND PUMPS: Model Series: HP110, HP227-257, HP211-252D, HPX1500-2800

HPX1500 – HPX2800 Ultra High Pressure Manual Pump.

INTRODUCTION

The operating and maintenance procedures listed within this manual should be adhered to and will enable the operator to obtain maximum efficiency and reliability from the equipment.



PRECAUTIONS

Prior to connecting the hydraulic pump to any equipment, the user is to ensure that:-

- The working pressure of the hydraulic pump and the equipment to be operated are compatible.
- The reservoir pump capacity is adequate to operate the equipment throughout its range.
- The hydraulic oil specifications used within the pump and the equipment are compatible.

TECHNICAL SPECIFICATION- HPX1500

Working Pressure: 1500 Bar
Total Oil Capacity: 1800 cm³
Effective Oil Capacity: 1200 cm³
Displacement/Pump stroke, Low-press: 20 cm³
Displacement/Pump stroke, High-press: 1.0cm³
Pumping Effort: 370N
Weight: 6.5kg

TECHNICAL SPECIFICATION- HPX1500

Working Pressure: 2800 Bar
Total Oil Capacity: 1800 cm³
Effective Oil Capacity: 1200 cm³
Displacement/Pump stroke, Low-press: 20 cm³
Displacement/Pump stroke, High-press: 0.8cm³
Pumping Effort: 370N
Weight: 6.5kg

RECOMMENDED OIL

Hydraulic oil, viscosity class ISO 32

Prior to use:

Operate the handle with the Release valve open as shown in figure 1. This will assist in bleeding the pump of air trapped in the system.

Figure 1:



During test and operation of the pump it is recommended that a length of hose is either connected to a tool or terminated with a coupling and blanking plug is connected to the pump.

This assists in moving a reasonable quantity of oil from the pump prior to pressurising and prevents air from gathering and being trapped in the system.

Description of Pump Operation:

A dual piston system which delivers low pressure or high pressure throughout the pump stroke. The system switches automatically between low and high pressure to ensure maximum efficiency whatever the load.

Safety Feature:

The pump is equipped with an internal tamper proof safety valve that regulates the maximum working pressure. The safety valve is set to the maximum pump working pressure and is factory pre-set.

Installation

General

Always check that hoses, couplings, cylinders and tools, etc; that are connected to the pump are designed for use at a working pressure that equals or exceeds the maximum working pressure of the pump.

Connecting the hydraulic hose

Connect the hydraulic hose using a G 1/4" coupling, or use a Hi-Force quick coupling, tightening to a maximum torque of 40–50 Nm. Air can become trapped in the hydraulic system when you connect hoses and tools, and this can lead to problems with operation. Refer to the heading Bleeding the hydraulic system.

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HYDRAULIC TOOLS

INSTRUCTION MANUAL – HYDRAULIC HAND PUMPS: Model Series: HP110, HP227-257, HP211-252D, HPX1500-2800

Other accessories

All accessories that are connected to the pump must be designed for a working pressure that is at least equal to the maximum working pressure of the pump.

Connecting cylinders/tools

Cylinders or tools can only be connected to the pump when the system is depressurised. Always make sure that the release knob is in the open position (Figure. 1) before connecting any accessory equipment.

OPERATION OF THE PUMP

Rotate the release valve clockwise (figure; 2) until it seats, then raise the pump handle.

The low pressure piston is withdrawn. The stationary high pressure piston mounted in the valve body is simultaneously withdrawn from the hollow low pressure piston. The vacuum that is then created both in the low pressure piston's pump bore and inside the piston causes oil to be sucked from the oil container via a passage, past the two intake balls and into each other, the intake balls close and the oil from both the high and low pressure piston is forced past the discharge ball and out into the discharge connection.

When the load on the pump increases to around 20-30 bar, a valve opens a passage between the low pressure pump piston's pump bore and the oil container. The low pressure function is now disengaged. Only the high pressure piston is working.

The safety valve opens a passage between the high pressure piston and the oil container when the load reaches maximum working pressure.

When the release valve is turned anti-clockwise (Figure 1), a passage is opened between the discharge connection and the oil container allowing the pressure to be released.

Figure: 2



Maintenance

To ensure reliable operation and long life it is important to carry out maintenance at set intervals. You should always follow these simple rules:

Always make sure that:

- The pump is cleaned before returning to storage.
- Lubricate moving parts.
- Check that there are no external hydraulic oil leaks.
- Make sure the pump has not suffered any external damage, as a result of impacts, etc.

Servicing

Checking the oil level

The oil level should always be measured when the cylinder/tool is in its lowest or retracted position.

The filler hole on the hydraulic oil reservoir is also used to check the level. Position the pump with the pump head facing downwards, and remove the filler plug. The level is correct when the oil reaches the bottom edge of the filler hole. Refit the filler plug, tightening it to a maximum torque of 20 Nm.

OIL LEVEL

Place the pump on a horizontal surface, remove filler cap from the oil tank. Fill-up with the recommended grade of oil until the level is approx. 20mm from the bottom of the filler hole.

BLEEDING

Place the pump on a bench or similar, with the pump head slightly inclined downwards and the ram on the floor standing on its pressure head. Pump up to approx. half its stroke and leave to stand for a few minutes. Allow the ram to retract very slowly. Repeat this operation a few times until all the oil has been bled from the system. In order to bleed the pump system separately, pump with the release valve fully open (Figure 1).