

Hi-Force® HYDRAULIC TOOLS

INSTRUCTION MANUAL – Electric Driven Pump Series HEP: Model Series: HEP1, HEP103, HEP2, HEP3, HEP5



Description:

Hi-Force HEP series pumps are designed to operate high pressure hydraulic cylinders and tools with a maximum working pressure of 700 bar. These instructions cover all HEP series models. Refer to nameplate on pump for the full model identification.



Please read this instruction booklet carefully before operating the product and keep in a safe place for future reference.

It is the responsibility of the purchaser to ensure that operators are properly trained in the safe use of this equipment and have access to **Hi-Force Operating and Safety Instructions**.

No modification and/or additions may be made to this equipment without the written permission of the manufacturer. It is expected that the product is used by competent technical personnel who have been properly trained to use hydraulic lifting equipment

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:-
HEP12 series – 700bar (10,000psi)
HEP103 series – 700 bar (10,000psi)
HEP2, HEP3 & HEP5 series – 700 bar (10,000psi)




Sufficient time should be allocated to planning your hydraulic system.


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

 Always stand the pump on a stable level surface during operation.


 Never invert the pump or lay it on its side either in use, during transportation or in storage.

 Inspect all hoses on a regular basis for damage and wear. **Do Not** use hoses that are frayed, abraded or leaking.





Never lift, pull or carry any hydraulic pump or 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.

 **Never** pressurize disconnected couplings

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.

 Always isolate the pump from the electrical supply when carrying out any maintenance work or adjustments to the pump.

 Be aware of hot surfaces on the motor of the electric pump. Do not obstruct the free flow of cooling air around the motor fan and casing.

Instructions for HEP1 series two stage compact pumps:

Two Models: HEP1211S and HEP1212S

Specification:

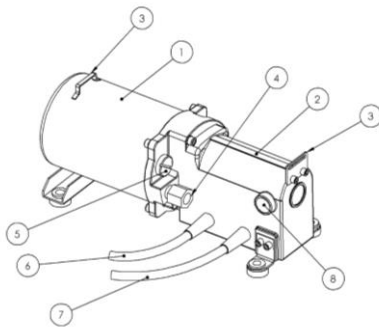
Model No:	Electric Motor	Hydraulic Pump	Oil Capacity
HEP1211S	0.35kW-110v- 1-Phase-50/60Hz	1st Stage: 2 l/min to 10 Bar 2nd Stage: 0.2 l/min to 700 Bar	1.0 litres (Useable 0.8 litres)
HEP1212S	0.35kW-220v- 1-Phase-50/60Hz	1st Stage: 2 l/min to 10 Bar 2nd Stage: 0.2 l/min to 700 Bar	1.0 litres (Useable 0.8 litres)

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INSTRUCTION MANUAL – Electric Driven Pump Series HEP: Model Series: HEP1, HEP103, HEP2, HEP3, HEP5

These pumps are suitable for use with single acting cylinders or tools only. All cylinders used with these pumps must be rated at 700 bar maximum operating pressure. These pumps should never be used with double acting cylinders. If in doubt consult **Hi-Force Ltd**; or your approved **Hi-Force** distributor.

Description of parts:



HEP1 pump unit

1. Oil reservoir
2. Electric motor
3. Loop for carrying strap
4. Hydraulic connection.
5. Oil filler plug.
6. Power lead
7. Lead to control pendant.
8. Carbon brush cover.

Operation.

- Connect pump to power supply.
- Depress the ON button on the control pendant to start the motor and advance the cylinder/ tool. When the button is released the motor stops and the pump will maintain pressure to hold the load in place.
- To retract the cylinder depress the OFF button on the pendant to return oil to tank. **Note:** The cylinder will retract fully even if the button is released.
- If it is required to stop the cylinder retracting part way through its travel then it will be necessary to press the ON button once more to build up pressure again.

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:

- Use only Hi-Force HFO32 oil to keep the reservoir topped up. Ensure that connected cylinders are fully retracted before checking oil level otherwise reservoir may become pressurised and damaged.
- The Oil should be changed completely after approximately 300 hours working time. To drain the oil, remove the filler plug and tip the oil out. Dispose of used oil in accordance with environmental procedures.
- The oil reservoir is sealed but when connecting new hoses and cylinders air can become trapped in the reservoir causing intermittent operation or the pump not to deliver oil. To remove the air, fully retract cylinder. Stand pump vertically with filler plug (5) uppermost. Remove the filler plug, and top up with oil. Replace filler plug and operate pump several times in a vertical position.
- If the pump will still not deliver oil stand the pump level on its feet and insert a smooth round ended rod through the hole in the rear end of the reservoir and push the rubber bladder inwards by about 30mm while operating the motor. Take care not to damage the rubber bladder.
- Carbon brush replacement. The brushes will wear down in use and eventually cause the motor to stop. Replace with genuine brushes only. Disconnect from power supply. Remove the two rubber covers (8) and remove fitting screws so that brushes can be

removed and replaced. Replace covers afterwards.

Instructions for HEP103 series two stage compact pumps:

Models: HEP103241LS, HEP103242LS, HEP103241S, HEP103242S, HEP103341, HEP103342, HEP103441, HEP103442, HEP103441LS, HEP103442LS

Specification:

Model No:	Electric Motor	Hydraulic Pump	Oil Capacity
HEP103**	0.45kW-100/110v-1-Phase-50/60Hz-9.5A	1st Stage: 2.5 l/min to 150 Bar 2nd Stage: 0.35 l/min to 700 Bar	5.0 litres (Useable 4 litres)
HEP103**	0.45kW-220/240v-1-Phase-50/60Hz-9.5A	1st Stage: 2.5 l/min to 150 Bar 2nd Stage: 0.35 l/min to 700 Bar	5.0 litres (Useable 4 litres)

Instructions before use.

Visually inspect all components for damage or oil leaks. Ensure control pendant cable is correctly fitted **before** connecting to the mains supply. Oil filler plugs are shut tightly when being shipped and not in use. Before pump is to be used, turn this plug by 1 to 2 turn anti-clockwise to open the vent. See Figure 1.



Figure 1:

DO NOT OPERATE PUMP WITH VENT CLOSED AS THIS MAY CAUSE NO OIL DELIVERY OR A BUILD UP OF PRESSURE.

- Ensure the correct power supply is used for your model of Hi-Force pump. Either 110V or 220/ 240V 50/60Hz single phase.

- Check the oil level before use. Retract the cylinder fully beforehand to do so. Only use Hi-Force Hydraulic oil.

Operation.

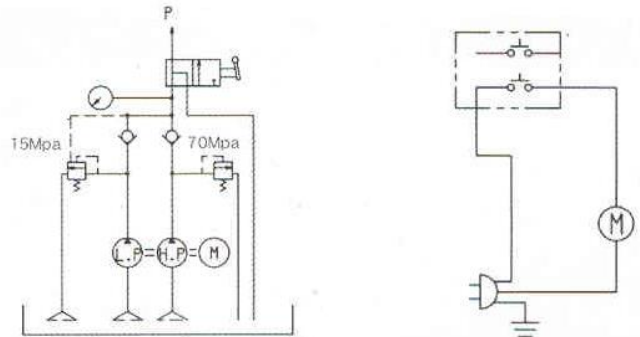
HEP103341 and HEP103342

1. Close release valve lever by turning clockwise 45°. See Figure 2.
2. Press 'ON' button to advance cylinder. Release the button and the cylinder will hold its position.
3. To retract cylinder return release valve lever to its original position.



Figure: 2

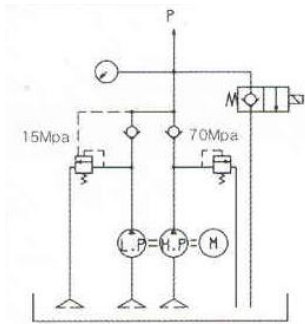
Circuit Diagram: HEP103341, HEP103342



HEP103241LS HEP103242LS

1. Press 'ON' button to run the motor to advance the cylinder. If the 'ON' switch is released the motor stops and the cylinder's piston remains stopped for load holding.
2. Press 'OFF' button to retract cylinder.

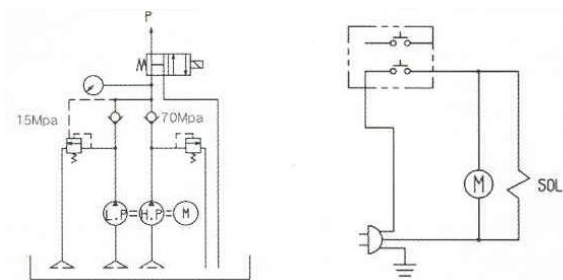
Circuit Diagram: HEP103241LS, HEP103242LS



HEP103241S HEP103242S

1. Press 'ON' button to run the motor to advance the cylinder.
 2. Release 'ON' button to stop the motor and the cylinder retracts.
- Note: The 'OFF' button has no function.

Circuit Diagram: HEP103241S, HEP103242S



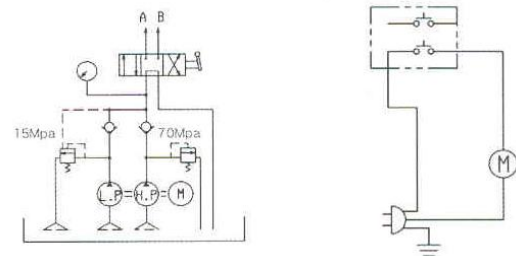
HEP103441 HEP103442

1. Turn manual valve handle to left hand side position (45° max). Press 'ON' button to advance cylinder. (Flow to port A. Port B returns flow to the reservoir). See Figure 2.
2. Before retracting the cylinder, return valve handle to neutral (front) position. (Both ports A and B are blocked).
3. Turn manual valve handle to the right hand side position (45° max). Press 'ON' button to retract the cylinder (Flow to port B; port A; returns flow to the reservoir). See Figure 3.



Figure: 3

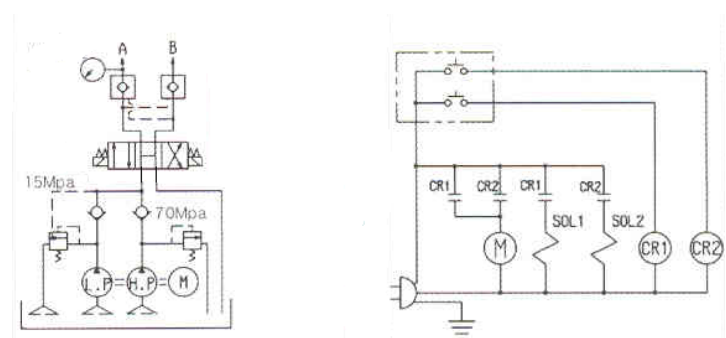
Circuit Diagram: HEP103441, HEP103442:



HEP103441LS HEP103442LS

1. Press 'ON' button to run the motor and to advance the cylinder. (Flow to port A. Port B returns flow to reservoir). The motor stops with button 'ON' released.
2. Press 'OFF' button to run the motor and to retract the cylinder. (Flow to port B; port A; returns to the reservoir.)
3. Pressure holding of both A and B ports by means of pilot-operated check valves when no buttons pressed.

Circuit Diagram: HEP103441LS, HEP103442LS



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:

- Inspect the pump for damage after each use.
- Change the oil every 300 working hours using Hi-Force HFO46 oil.

Have the pump serviced regularly by a Hi-Force authorised repair centre.

Instructions for HEP2, HEP3 & HEP3 series two stage electric Driven Pumps

Motor size and supply options:

HEP2 Series: Motor 1.5kW
 Supply: 110/115v single phase 50Hz or 60Hz
 220/240v single phase 50Hz or 60 Hz
 380/440v three phase 50/60Hz

HEP3 & HEP5 Series: Motor 2.2kW
 Supply: 110/115v single phase 50Hz or 60Hz
 220/240v single phase 50Hz or 60 Hz
 380/440v three phase 50/60Hz

Common models and typical uses are given below:-

Model No:			Hydraulic Connection
HEP207111	HEP310121	HEP517122	No control valve, Pump (P) and Tank (T) connections for single and double acting cylinders, controlled by remote mounted valves.
HEP207112	HEP310122	HEP517142	
HEP207114	HEP310124	HEP517144	
HEP207121	HEP310141	HEP517162	
HEP207122	HEP310142	HEP517164	
HEP207124	HEP310144		
HEP207211	HEP310221	HEP517242	2 way valve for operating single acting cylinders and tools requiring advance and retract, but no "hold" function. E.g. Crimpers and cutters
HEP207212	HEP310222	HEP517244	
HEP207214	HEP310224	HEP517262	
HEP207221	HEP310241	HEP517264	
HEP207222	HEP310242		
HEP207224	HEP310244		
HEP207311	HEP310321	HEP517342	3 way valve for operating single acting cylinders requiring advance, retract and central load hold position. E.g. Simple lifting operations
HEP207312	HEP310322	HEP517344	
HEP207314	HEP310324	HEP517362	
HEP207321	HEP310341	HEP517364	
HEP207322	HEP310342		
HEP207324	HEP310344		
HEP207411	HEP310421	HEP517442	4 way valve for operating double acting cylinders, requiring advance, retract and central load hold position. E.g. lifting and positioning where more control is required.
HEP207412	HEP310422	HEP517444	
HEP207414	HEP310424	HEP517462	
HEP207421	HEP310441	HEP517464	
HEP207422	HEP310442		
HEP207424	HEP310444		

Note: Models with a suffix 'S' (e.g. HEP207414S) have a 3 or 4 way solenoid operated valve with a remote control pendant.

Note: Models with a suffix 'S-AR' (e.g. HEP310322S-AR) have a 3 way solenoid operated valve with an auto retract function.

IDENTIFICATION OF COMPONENTS

Refer to figure 1 and 2.

FIGURE 1

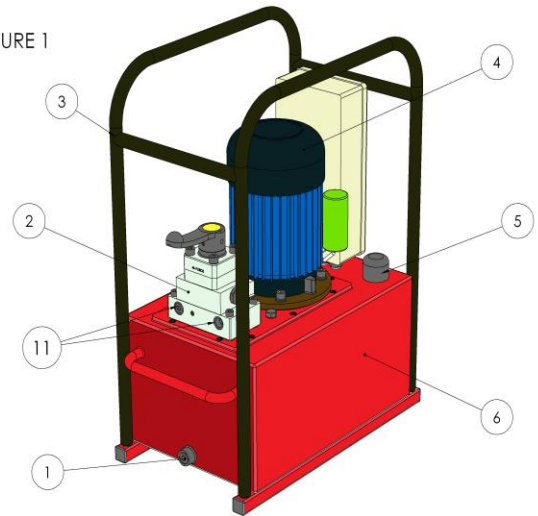
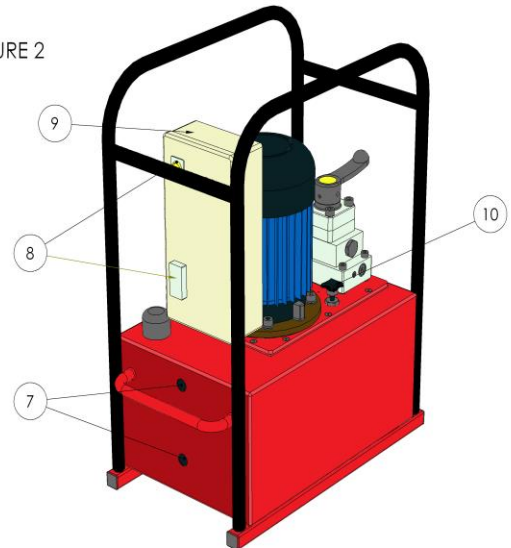


FIGURE 2



1. Hydraulic oil drain plug.
2. Hydraulic directional control valve – if fitted (type will vary)
3. Roll frame (optional).
4. Motor.
5. Oil filler breather cap.
6. Tank.
7. Hydraulic oil level gauge.
8. On/off switches
9. Electrical control box.
10. Adjustable pressure relief valve.
11. Hydraulic service connections, (one or two ports, depending on valve type)
12. Remote control pendant (fitted to models with solenoid valves only).

PREPARING THE PUMP FOR FIRST USE

1. Immediately after unpacking, examine the pump for signs of transit damage and if found contact the shipping company.
2. Establish the oil level in the oil reservoir using the level gauge on the end of the tank. Depending on the shipping method used, the reservoir may either be supplied full or empty. If the reservoir is empty it must be correctly filled before use. Remove the temporary transit plate which is fitted in the position of the filler breather cap (5) by undoing the 3 screws. Fit the filler breather cap (packed separately) using the 3 screws which held the transit plate.
3. To fill the reservoir: Remove the filler cap (5) and fill the tank with clean HFO46 oil to the upper level indicator (7).
4. Make sure that the voltage indicated on the motor rating plate corresponds with the available supply.
5. Remove steel or plastic hexagon headed plugs and make hydraulic connections to service ports (11). These ports have a 3/8" NPT female thread and the corresponding male connections should be wrapped with PTFE tape or other suitable sealant. N.B On 3 way valves the service port is the right hand one, when viewed as in figure 1.
6. Ensure the lever of the hydraulic directional control valve (2) is in the neutral position: This is fully anticlockwise for models with 2 way valve or the central position for models with 3 or 4 way valves. Where valves are remotely mounted, ensure these are adjusted such that pressure will not build up during the starting operation. See table on page 1.
7. Ensure switch is set to 'off' (8). Connect motor to required power source.

8. Check the direction of the motor rotation by turning the starter switch (8) to the 'ON' position then to the 'off' position, whilst doing this observe the motor fan. The motor should run in a clockwise direction viewed from above. If the direction is wrong check the wiring of the electrical connector. **Running the pump with incorrect rotation may damage the low pressure pump unit.**

OPERATION OF PUMPS WITH MANUAL VALVES

Hi-Force does not necessarily know what equipment this pump will power. Read and understand the appropriate operating instructions relating to the equipment in use.

1. With all hydraulic connections made and motor running, operate the directional control valve (2) if fitted to control the cylinders or tools in use.

For pumps with 2 way valves: Turning the lever fully clockwise will supply oil to the service port and advance the cylinder. Turning the lever anticlockwise will retract the cylinder.

For pumps with 3 way valves: Mid position is the load hold position. Moving the lever so that it is above the service port (anti-clockwise) will supply oil to the port and advance the cylinder. Moving the lever away from the service port will connect the service port to tank and retract the cylinder.

For pumps with 4 way valves: Mid position is the load hold position. Moving the lever so that it is above either service port will supply oil to that port and connect the opposite port to tank.

2. The pump is fitted with an adjustable pressure relief valve (10) to restrict the output pressure to any desired value up to the maximum working pressure of the pump. To increase the relief valve setting

turn the control knob clockwise. To decrease the relief valve setting turn the control knob anticlockwise. Leaving the pump running for extended periods with the relief valve operating will cause the oil to overheat.

- 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.

3. Ensure that the oil level does not fall below the minimum level as shown by the lower indicator (7)

OPERATION OF PUMPS WITH SOLENOID VALVES

1. Turn switch to 'on' position (8)
2. Depress 'advance' button on pendant to advance cylinder. (Cylinder remains in the load holding position when button released).
3. Depress 'retract' button to retract cylinder.

OPERATION OF PUMPS WITH SOLENOID VALVE AND AUTO RETRACT FUNCTION

1. Turn switch to 'on' position (8)
2. Depress 'advance' button on pendant to advance cylinder. (Cylinder will not remain in the load- holding position when button is released).
3. Release 'advance' button to retract cylinder.

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:

- Inspect the pump for damage after each use.
- Change the oil every 500 working hours using Hi-Force HFO46 oil.
- Have the pump serviced regularly by a Hi-Force authorised repair centre.

Always make sure that:

- The pump is cleaned before returning to storage.
- Lubricate moving parts.