



Bulletin HY30-8214-INST/UK



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# Installation and Startup Manual Hydraulic Pumps Series VP1-095/-110/-130

Effective: May 01, 2015

Supersedes: January 01, 2013

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## Important installation information

1. Make sure max input torque and max bending moment of the PTO (including the VP1 pump) are not exceeded. Also, make sure the direction of rotation of the VP1 pump correspond to the PTO, and that pump and PTO specifications are not exceeded in the application.
2. When VP1-095, -110 and -130 is assembled to an engine PTO make sure that the pump isn't overheated in the off-load mode. For more information, see page 4, BPV-VP1 unloading valve.
3. Never use excessive force when installing a gear, coupling or sleeve on the VP1 pump shaft.
4. The pump should be installed below the lowest oil level in the reservoir (fig. 6, pg. 5); if this is not possible, please contact Parker Hannifin for further information.
5. A separate drain line must be installed between the control drain port T and the reservoir (refer to fig. 6, pg. 5); connect the drain line directly to the oil cooler (if the hydraulic system is so equipped).
6. A pressure relief valve is recommended in the outlet (pressure) line from the pump; it should be set 15–20 bar higher than max pressure setting of the pump.

Example: The main pressure relief valve located in the directional control valve.

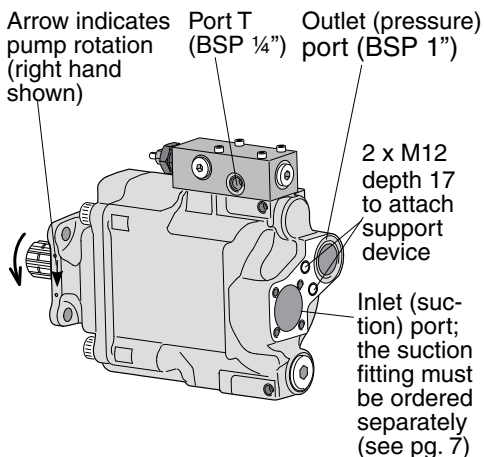


Fig. 1. VP1-095/-110/-130 main ports; right hand rotating pump.

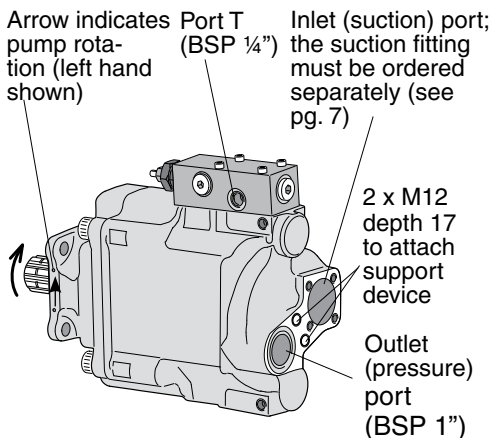


Fig. 2. VP1-095/-110/-130 main ports; left hand rotating pump.

**NOTE:** Always run a function, after adjusting the standby pressure or the max pressure setting, before you read the value.

**NOTE:** - The suction fitting must be ordered separately (refer to pg. 7)  
- VP1-095/-110/-130 installation on a PTO: please refer to page 3 for information.

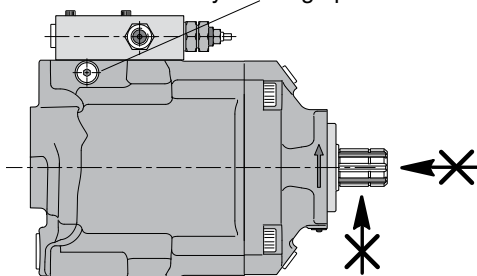
## VP1 installation on a PTO /engine PTO

The VP1 input shaft must **not** be subject to external radial and/or axial forces (see illustration to the right).

Installation examples:

- a) A gear drive with a bearing supported gear is acceptable (as shown in the illustration below)
- b) A gear mounted directly on the VP1 input shaft is usually **not** acceptable
- c) A belt drive pulley installed directly on the VP1 input shaft is usually **not** allowed

Gauge port **M** (BSP  $\frac{1}{4}$ ");  
system high pressure



**NOTE:** If an installation according to b) or c) above, is considered, contact Parker Hannifin.

Fig. 3. Usually, no external radial and/or axial forces are allowed on the VP1 shaft

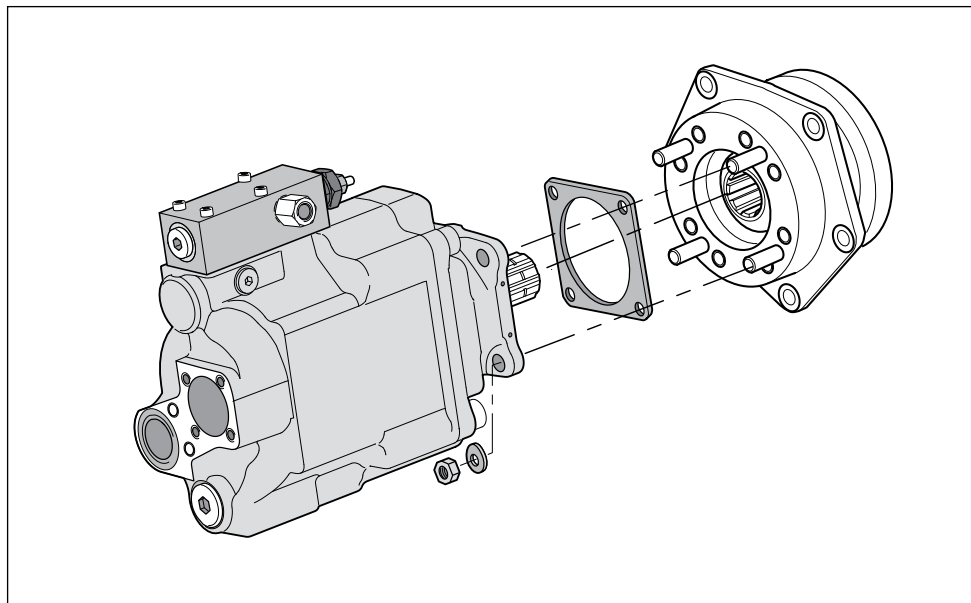


Fig. 4. VP1-095/-110/-130 shown with a bearing supported gear on an engine PTO adapter (example).

## VP1 installation on an engine PTO

### BPV-VP1 unloading valve

The BPV-VP1 unloading valve is utilized in hydraulic systems where the pump is in constant operation.

The valve protects the pump from being overheated in the off-load mode by allowing a small flow through the pump. When load sensing valve function is engaged, the bypass flow is cut off (as port 'X' is being pressurized).

The valve will also de-air the suction line and the pump body after a long standstill.

(The pump is assembled above the oil-tank and during the standstill some of the oil in the pump housing has been drained back to the oil-tank)

Valve type	Ordering number
BPV-VP1	<b>379 8799</b>

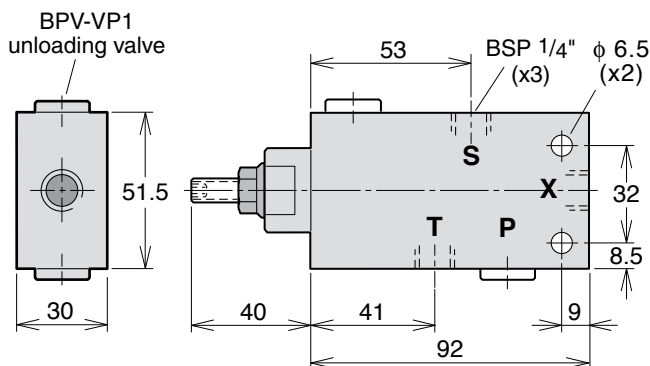


Fig. 5. BPV-VP1 unloading valve.

For more information also see HY30-8226-INST/UK, Installation Information Unloading Valve BPV for VP1

## Start-up procedure

- Make sure the entire hydraulic system is as clean as possible before filling it with a recommended fluid.

- The pump must be filled with fluid and then purged before start-up (fig. 6).

Please note, that purging should only be performed when the pump is connected to the reservoir and the entire system is filled with hydraulic fluid.

- Air in the VP1 (or in the rest of the hydraulic system) can cause excessive noise and damage pump performance.
- When starting up the system, activate high flow/low pressure in order to purge the hydraulic system properly.
- As previously pointed out, a separate drain line is required between control port T and the reservoir (fig. 6).
- Do **not** install a suction filter in the inlet line.

## Fluids

Suitable fluids: Mineral based, hydraulic fluids type HLP (DIN 51524), ATF (automatic transmission fluids) and API/CD motor oils.

### Fluid temperature

Main circuit: Max 75 °C.

### Viscosity

Recommended viscosity: 20 – 30 mm<sup>2</sup>/s (cSt).

Operating viscosity limits:

- Min 10 mm<sup>2</sup>/s; max 400 mm<sup>2</sup>/s
- At start-up: max 1000 mm<sup>2</sup>/s.

### Filtration

- 25 µm (absolute) in clean environment and/or low pressures (<200 bar)
- 10 µm (absolute) in contaminated environment and/or high pressures (200 bar and above).
- Fluid cleanliness should follow ISO standard 4406, code 20/18/13.

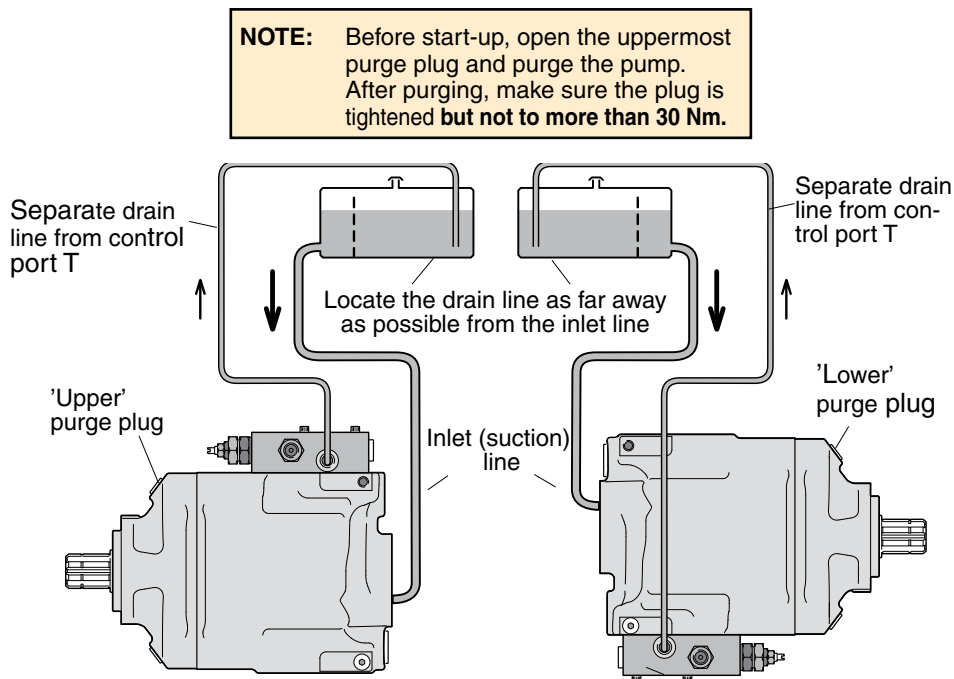


Fig. 6. Purging the VP1-095/-110/-130 (right hand pumps shown)

## LS control adjustments

(VP1-095/-110/-130)

### System pressure limiter

- The system (high) pressure relief valve is factory set at 350 bar.
- Although it can be set higher, the system pressure relief valve must **not**, under any circumstance, be set higher than 400 bar when the hydraulic system is being delivered to the final customer.
- Make sure 'max peak pressure 420 bar', as measured in gauge port M on pump (see fig. 3), is not exceeded.

### Standby pressure

- The standby pressure,  $\Delta p$ , is factory set at 25 bar but is adjustable between 15 and 40 bar.
- The 25 bar setting and the standard orifices usually provide an acceptable directional valve characteristic as well as system stability.
- For additional information, please contact Parker Hannifin.

### Adjustments (refer to fig. 7 below)

1. System (high) pressure adjustment screw; factory set at 350 bar (1 turn approx. 140 bar)<sup>1)</sup>
2. Counter nut for adjustment screw 1
3. Bushing; basic valve setting, factory set; **DO NOT TOUCH!**

Note: Before you read the measured value, always activate and run a function after you have made the adjustment of settings.

Adjust standby pressure first and then the system pressure.

4. Standby pressure adjustment bushing; factory set at 25 bar (1 turn approx. 17 bar)<sup>1)</sup>
5. Counter nut for bushing 4.

- <sup>1)</sup> Before attempting to change a setting, the corresponding counter nut must be opened; it should be re-tightened after the adjustment.

Item	Wrench / dimension
1	Hex Head Wrench / 4 mm
2	Wrench / 13 mm
3	<b>DO NOT TOUCH</b>
4	Wrench / 27 mm
5	Wrench / 27 mm

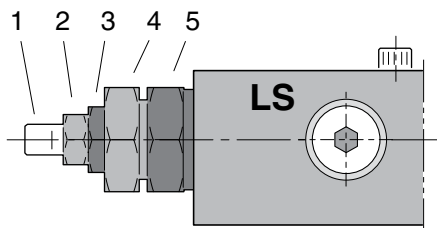


Fig. 7. VP1-095/-110/-130 control adjustments.

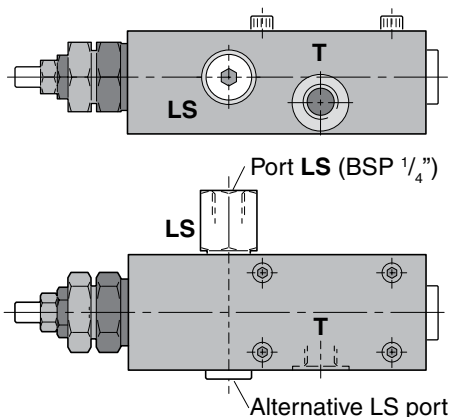
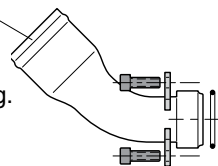


Fig. 8. VP1-095/-110/-130 control ports.

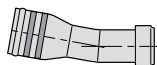
**NOTE:** Always run a function, after adjusting the standby pressure or the max pressure setting, before you read the value.

## Suction fittings for VP1-095/-110/-130

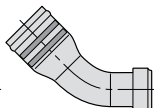
A 'suction fitting' consists of a straight, 45° or 90° suction fitting, clamps, cap screws and an O-ring.



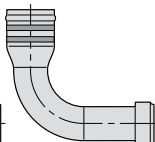
Suction fitting	Diameter	Order no.
'Straight'	2 1/2"	378 0637
45°	2 1/2"	378 0634
90°	2 1/2"	378 1980
Straight <sup>(2)</sup>	3"	378 3523
45 <sup>(2)</sup>	3"	378 3367
90 <sup>(2)</sup>	3"	378 8690



'Straight' fitting



45° fitting



90° fitting

2) Utilize the 3" fitting when the reservoir is below the pump or flow is larger than 140 l/min.

**NOTE:** A fitting is not included with the pump; it must be ordered separately.

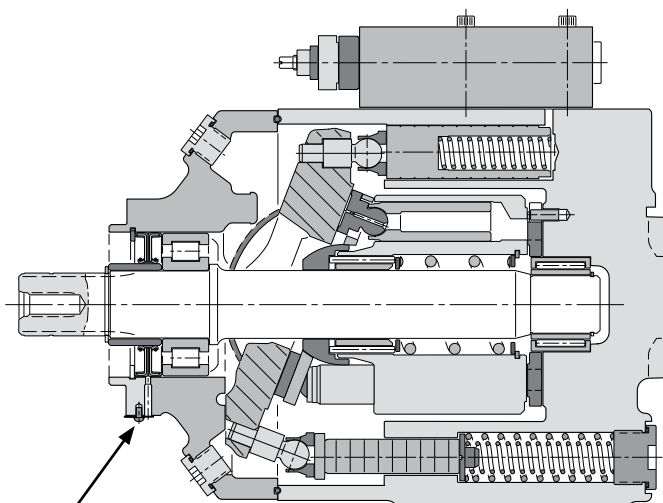


Fig. 9. VP1-095/-110/-130 indication hole.

If any oil should come out of the indication-hole on the pump;

- Stop the system immediately.
- Determine the cause of leakage.
- Replace damaged parts.
- Make sure you have corrected the source of the problem, not only the symptom.

Parker can not be held responsible for damage to PTO, engine and gear-box caused by improper maintenance of the hydraulic system.

## **Position notification regarding Machinery Directive 2006/42/EG:**

Products made by the Pump & Motor Division Europe (PMDE) of Parker Hannifin are excluded from the scope of the machinery directive following the "Cetop" Position Paper on the implementation of the Machinery Directive 2006/ 42/ EC in the Fluid Power Industry.

All PMDE products are designed and manufactured considering the basic as well as the proven safety principles according to:

- SS EN ISO13849-2:2008-09, C.2 and C.3 and,
- SS EN 982+A1:2008,

so that the machines in which the products are incorporated meet the essential health and safety requirements.

Confirmations for components to be proven component, e. g. for validation of hydraulic systems, can only be provided after an analysis of the specific application, as the fact to be a proven component mainly depends on the specific application.

### **Dr. Hans Haas**

General Manager  
Pump & Motor Division Europe



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