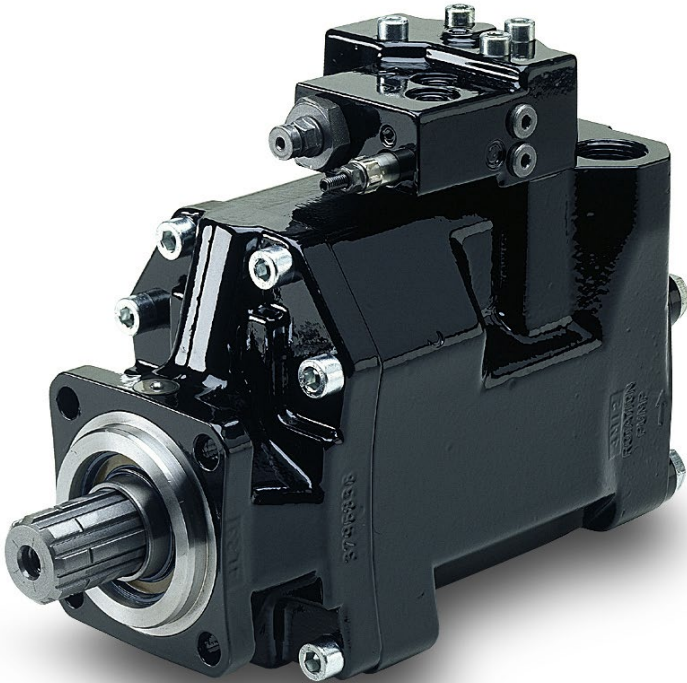


# Vp1 Series Axial Piston Variable Displacement Pumps Installation Manual

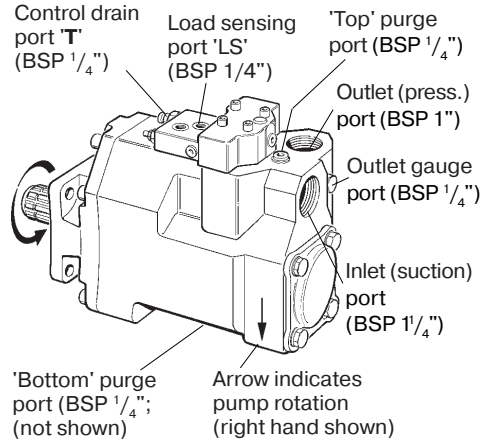
---



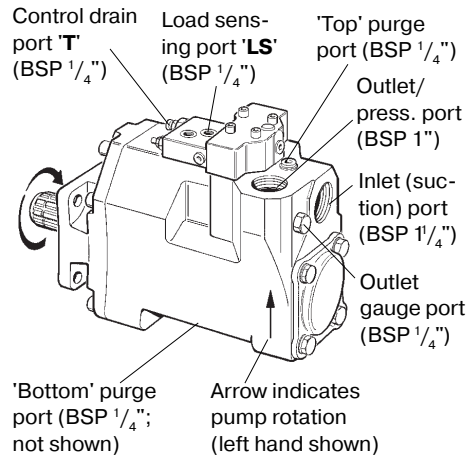
ENGINEERING YOUR SUCCESS.

## 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 VP1-0457-060/-075 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.
7. Fill the pump with oil and bleed the pump before start-up.



**Fig. 1.** Ports, right hand rotating pump.



**Fig. 2.** 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:

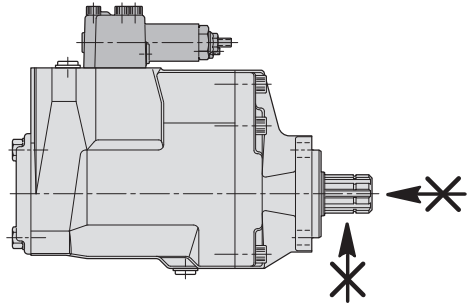
- The suction fitting must be ordered separately (refer to pg. 7)
- VP1-045/-060/-075 installation on a PTO: please refer to page 3 for information.

## 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:

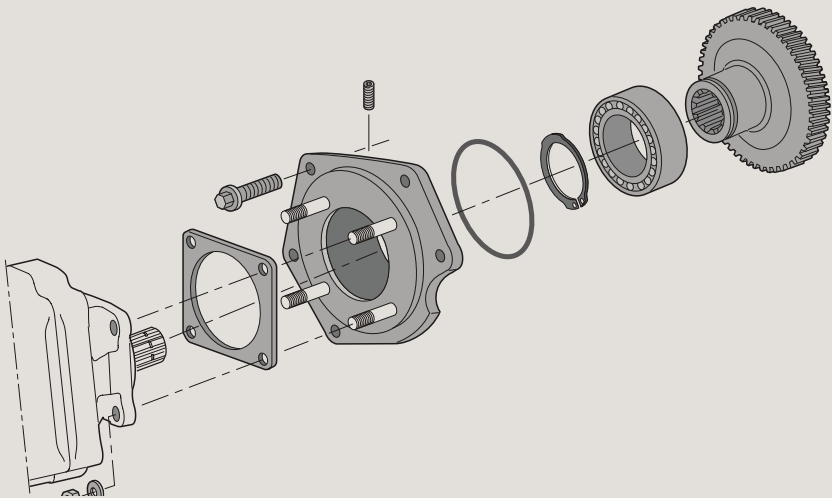
- a) A gear drive with a bearing supported gear is acceptable (as shown in the illustration below)
- b) A gear mounted directly on the VP1 input shaft is usually **not** acceptable
- c) A belt drive pulley installed directly on the VP1 input shaft is usually **not** allowed



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

### NOTE:

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



**Fig. 4.** VP1-045/-060/-075 shown with a bearing supported gear on an engine PTO adapter (example).

## VP1 installation on an engine PTO

### BPV-VP1 unloading valve

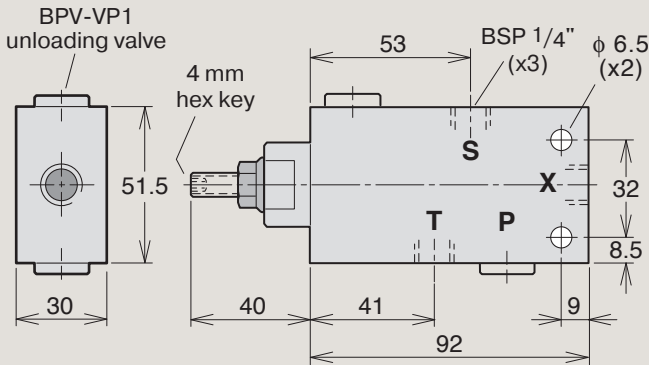
**The BPV-VP1 unloading valve is utilized in hydraulic systems where the pump is in constant operation.**

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.

(If the pump is assembled above the oil-tank and during a longer standstill of the Truck, some of the oil in the pump housing can be 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 MSG30-8226-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).

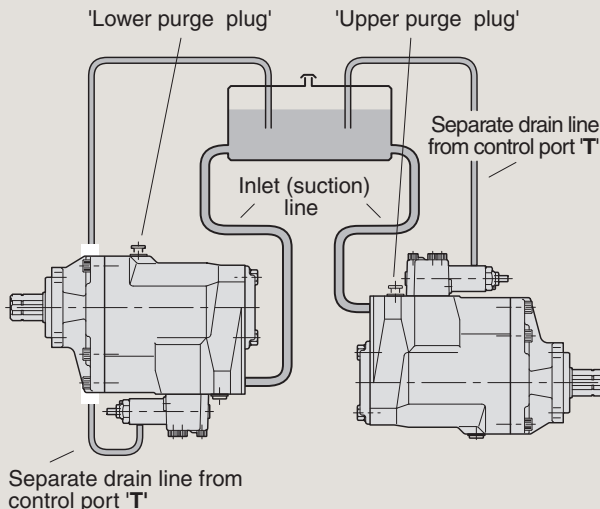
Operating viscosity limits:

- 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.

**NOTE:** Before start-up, open the uppermost purge plug and purge the pump. After purging, make sure the plug is tightened **but not to more than 30 Nm**.



**Fig. 6.** Purging the VP1.

## Tandem coupling VP1-045/-060/-075

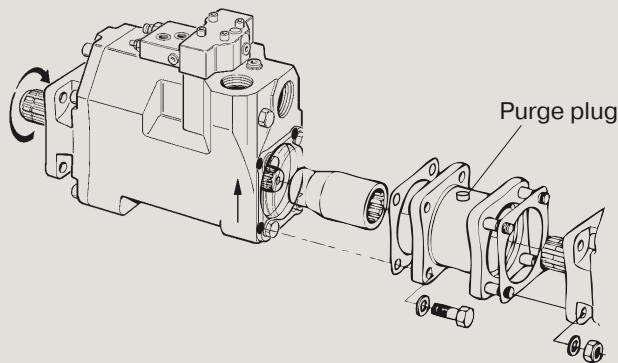
The VP1 pump has a through-shaft which means that an additional pump, such as a VP1 or other Truck pumps/Pumps can be installed in tandem with the VP1 by means of an adaptor kit (fig. 7).

### NOTE:

The bending moment caused by the weight of a tandem assembly normally exceeds that allowed by the PTO.

To prevent damage, the auxiliary pump should be supported by a bracket attached to the gearbox; it must **not** be fastened to the truck chassis.

Likewise, when the tandem assembly is installed on a separate bracket and driven by a cardan shaft, the auxiliary pump should have a support attached to the pump bracket.



**Fig. 7** Adaptor kit (P/N 379 7795) for tandem coupling.

### IMPORTANT:

Contact Parker Hannifin for additional information when considering tandem mounting a second VP1 pump. The maximum torque that can be transmitted through the first pump VP1-045/-060/-075 in tandem is 420 Nm.

### Installation information tandem coupling

1. The pump must be filled with oil and then purged before start-up.
2. Adaptor between the pumps shall be mounted with the purge plug pointing upwards, fill and purge the adaptor with oil.
3. When using VP1 pumps in Tandem set the standby pressure on the controls with a difference of 5 Bar ( Example 27 bar on Pump1 and 32 bar on pump 2).

## LS control adjustments

### Signal pressure limiter

- The signal pressure relief valve is factory set at 350 bar (fig. 8).
- The LS pressure relief valve must not, under any circumstance, be set higher than 380 bar when the hydraulic system is being delivered to a customer.
- Make sure max pressure not exceed 400 bar. The pressure can easily be measured in the gauge port on the pump housing.

### Differential pressure setting

- The standby pressure,  $\Delta p$ , is factory set at 25 bar but is adjustable to 35 bar.
- This 25 bar setting and the installed, standard orifices usually provide an acceptable directional valve characteristic as well as system stability.

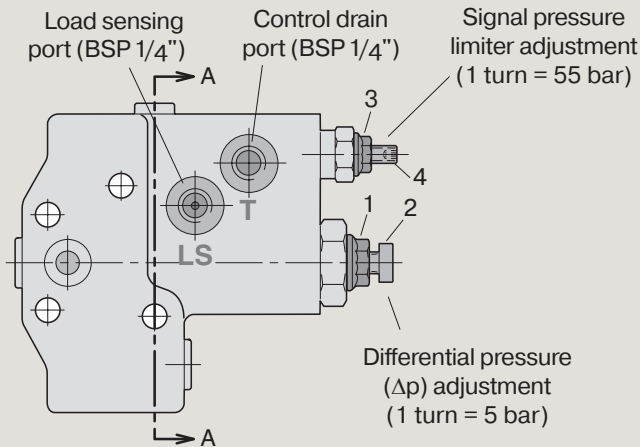
For additional information, please contact Parker Hannifin.

### Standby Pressure (factory set at 25 bar)

Item	Wrench / Dimension
1	Wrench / 13 mm
2	Hex Head / 4 mm

### Signal Pressure (factory set at 350 bar)

Item	Wrench / Dimension
3	Wrench / 10 mm
4	Hex Head / 3 mm



**Fig. 8.** LS control adjustments.

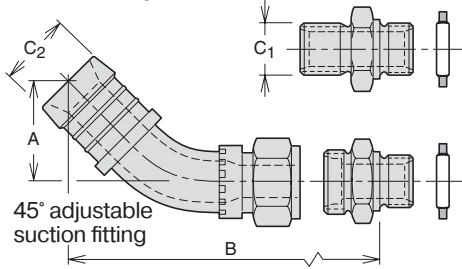
#### NOTE:

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

## Fitting kits for VP1-045/-060/-075 pumps

### Kits with 45° and 90° suction fitting

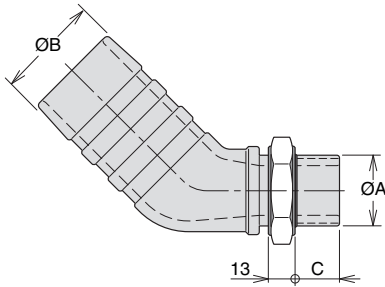
Pressure fitting



#### 45° fitting

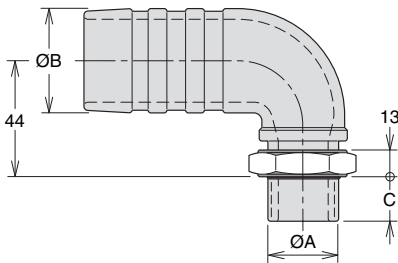
C <sub>1</sub>	ØC <sub>2</sub> mm	A mm	B mm	Order no.
BSP 3/4"	2"	71	154	379 9563
BSP 1" *	2 1/2"	64	147	379 9562

\* Above 100 l/min



#### 45° fitting

ØA	ØB inch	C mm	Ordering no.
BSP 1 1/4"	2"	18	00509035116
BSP 1 1/4"	2 1/2"	18	00509021916



#### 90° fitting

ØA	ØB inch	C mm	Ordering no.
BSP 1 1/4"	2"	18	00509034616

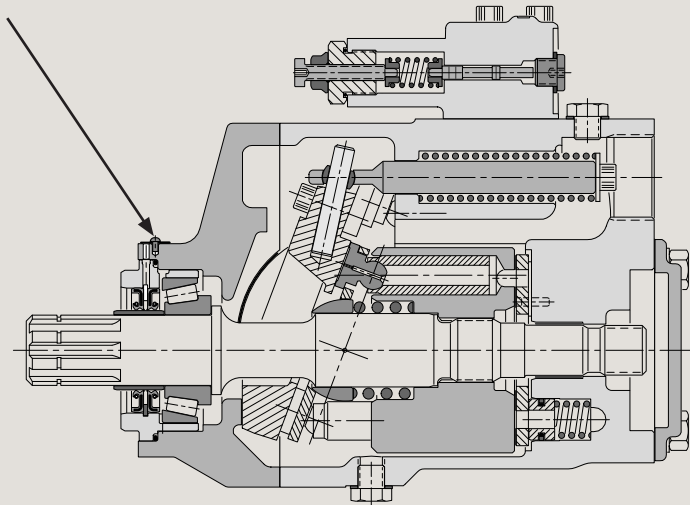
**Fig. 9.** Suction fittings.



**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 gearbox caused by improper maintenance of the hydraulic system.



**Fig. 10** Indication hole.

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

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:

- ISO 13849-1:2015
- SS-EN ISO 4413:2010

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 Manger

Pump & Motor Division Europe



## **WARNING – USER RESPONSIBILITY**

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Parker-Hannifin Corporation, its subsidiaries and authorized distributors provide product or system options for further investigation by users having technical expertise.

The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalogue and in any other materials provided from Parker or its subsidiaries or authorized distributors.

To the extent that Parker or its subsidiaries or authorized distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.

## **Offer of Sale**

Please contact your Parker representation for a detailed "Offer of Sale".

### **Parker Hannifin Manufacturing Sweden AB**

Pump & Motor Division Europe

Flygmotorvägen 2

461 82 Trollhättan

Sweden

Tel. +46 (0)520 40 45 00

[www.parker.com/pmde](http://www.parker.com/pmde)

MSG30-8222-INST/UK

Art. No 3780474- 14

© Copyright 2022

All rights reserved

