



Series V12

Series V12 is a bent-axis, variable displacement motor. It is intended for both open and closed circuits, mainly in mobile applications, but the V12 can also be utilized in a wide variety of other applications.

Features

- Max intermittent pressure to 480 bar and continuous operating pressure to 420 bar
- Thanks to low weight pistons with laminated piston rings and a compact design of the rotating parts, the V12 tolerates very high speeds
- High allowable speeds and operating pressures means high output power; the overall efficiency remains high throughout the entire displacement range
- The 9-piston design provides high start-up torque and smooth motor operation
- Wide displacement ratio (5:1)
- Broad range of controls and accessory valves for most applications
- Small envelop size and a high power-to-weight ratio
- ISO, cartridge and SAE versions
- Low noise levels due to a very compact and sturdy design with smooth fluid passages
- Positive piston locking, strong synchronizing shaft, heavy-duty bearings and small number of parts add up to a compact and robust motor with long service life and proven reliability.

Series V14

Series V14 is a new generation of variable displacement, bent-axis motors, a further development of our well known V12 motor.

It is designed for both open and closed circuit transmissions with focus on high performance machines .

Applications

- Excavators
- Forestry machines
- Mining and drilling machines
- Wheel loaders
- Winch drives

Optional equipment

- Integrated sensors for speed and displacement
- Integrated flushing and pressure relief valves

Additional benefits (compared to those of the V12)

- Improved speed capability
- Improved control performance
- Reduced number of parts
- Stronger shaft bearing support.

(cont'd ...)



Available motors

Model	Frame size	Version	Chapter
V12	60	ISO	2
	“	Cartridge	“
	“	SAE	“
	80	ISO	“
	“	Cartridge	“
	“	SAE	“
V14	160	ISO	“
	“	Cartridge	3
	“	SAE	“
	160	ISO	“
T12	“	SAE	“
	60	Cartridge	4
	80	“	“

Series T12

The T12 two-displacement motor is tailor-made for track drives. It allows a high ratio between high and low speed and installs as easily as a fixed displacement motor. Max speed ratio is 3.33-to-1.

The T12 is a cartridge motor based on the well proven V12 series. The specially designed end cap with dual side ports permits a very short installation.

A simple setting device moves the cylinder barrel to the maximum or minimum displacement position. The setting is controlled by an external hydraulic pilot signal. A brake valve can be fitted without increasing the axial length of the motor. The twin ports have the same mounting pattern as those of the F12 and V12 motors.

The F12/V12 accessory valve program also fits the T12 motor. As an option, integrated pressure relief valves can be included.



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Two-position control (HO T __ I)

The displacement is controlled by means of pilot pressure in port X5. When this pressure exceeds the threshold pressure, 15 bar, the displacement is switched to min.

The T12 motor can be ordered with max and/or min displacement limiters.

The control is available in two versions:

- **HO T 01 I** (with standard nozzles) provides a 'fast' control response (max-to-min and min-to-max)
- **HO T 02 I** (optional) with 'slow' control response.

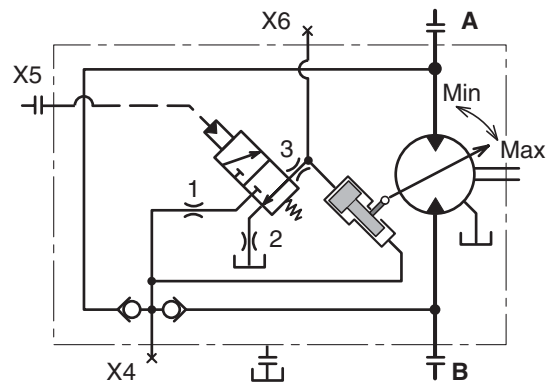
Gauge and pilot ports

- X4 Servo supply (before nozzle)
- X5 Pilot pressure (min 15 bar; standard)
- X6 Setting piston pressure (decreasing displ.)

Port size

- M14x1.5 (all)

NOTE: '1', '2' and '3' are nozzles.



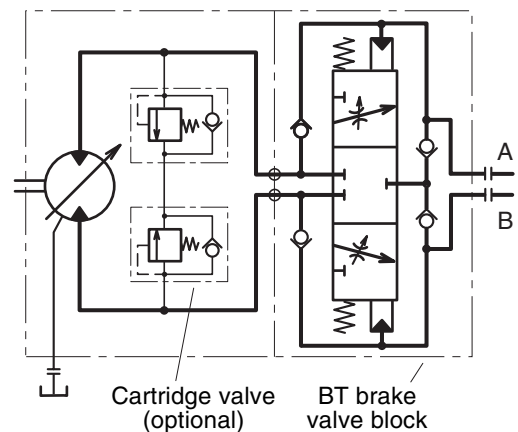
T12 schematic (no pilot pressure; the control is in max displacement position).

BT brake valve block (optional)

The BT brake (overcenter) valve is used to prevent overspeed in an open circuit (e.g. when the vehicle goes downhill).

The brake valve installs directly on the main port flange.

NOTE: For additional information refer to 'Mobile motor/pump accessories', catalogue HY17-8258/UK.



T12 with cartridge valves and brake valve block type BT.

Pressure relief valves (optional)

As an option, T12 motors can be ordered with pressure relief valves, designed to protect the motor and the main hydraulic system from short duration pressure peaks.

The non-adjustable cartridge valves are integrated in the motor end cap and available with the following pressure settings:

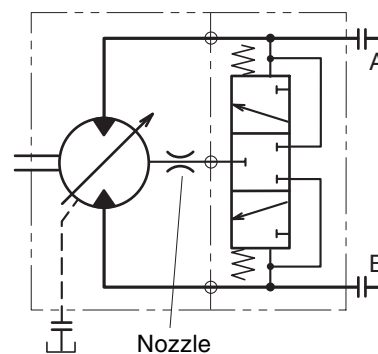
280, 300, 350, 380, 400 or 420 bar.

FV flushing valve block (optional)

The FV flushing valve supplies the T12 motor with a cooling flow usually required when the motor is operating at high speeds and/or high power levels.

The valve block mounts directly on the main port flange.

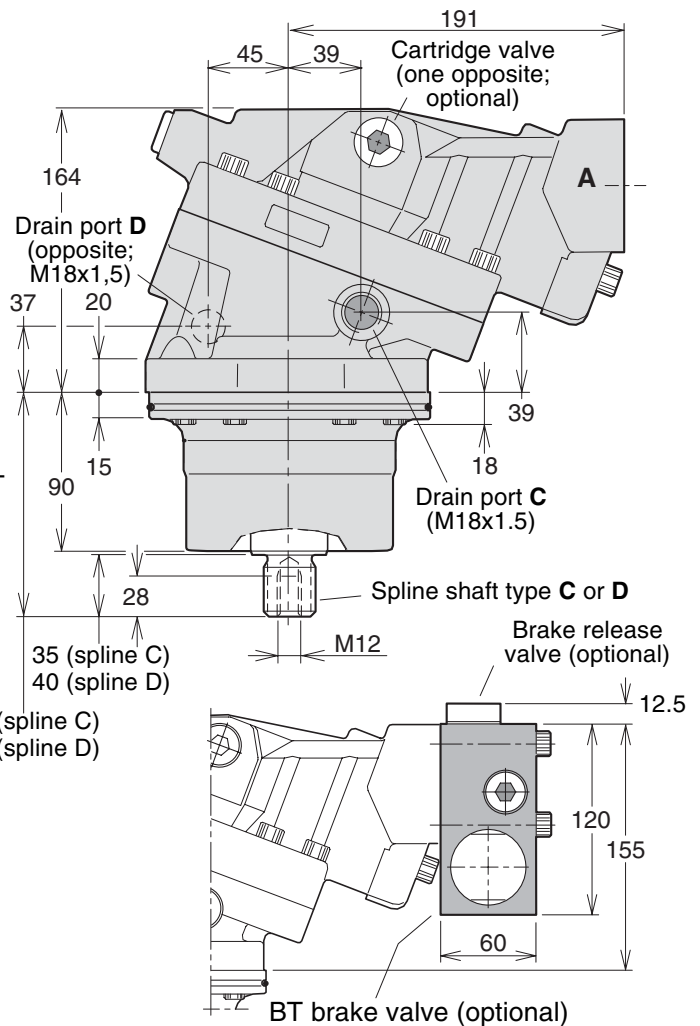
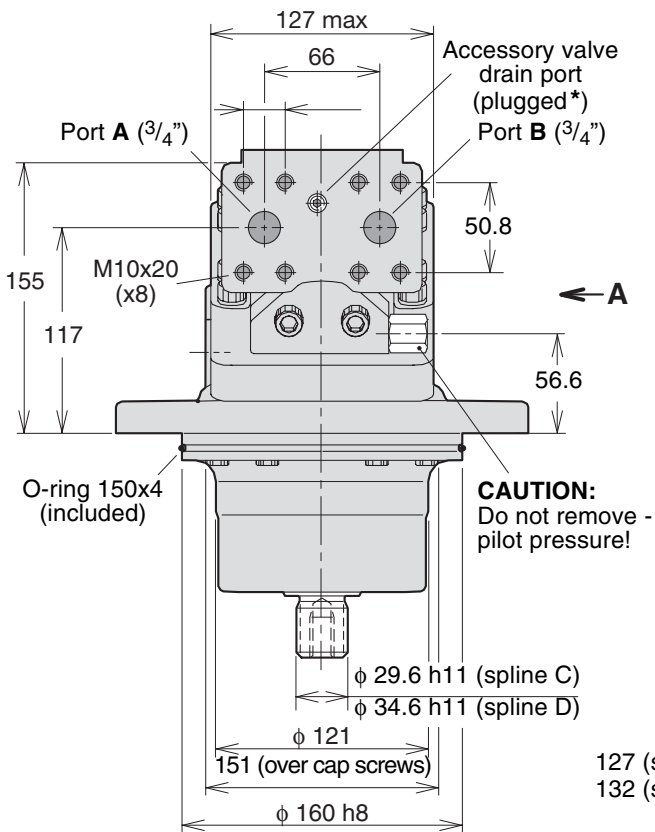
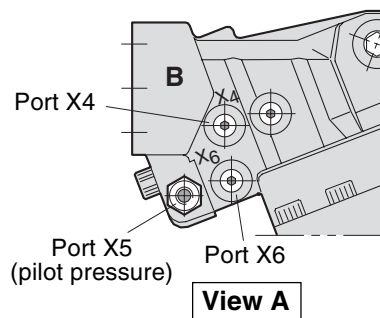
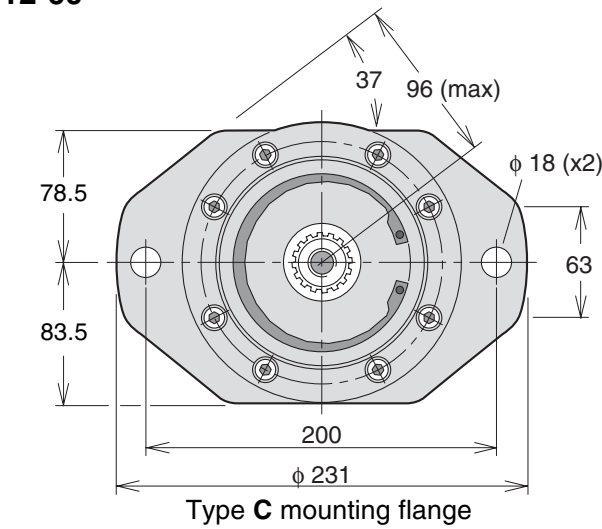
NOTE: For additional information refer to 'Mobile motor/pump accessories', catalogue HY17-8258/UK.



T12 with flushing valve block type FV.

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T12-60



*** NOTE:**

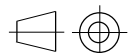
The accessory valve drain port plug **must be removed** before installing one of the following valves:

- **BT** brake valve (with flushing valve 'L' and/or brake release funktion 'B')
- **FV** flushing valve.

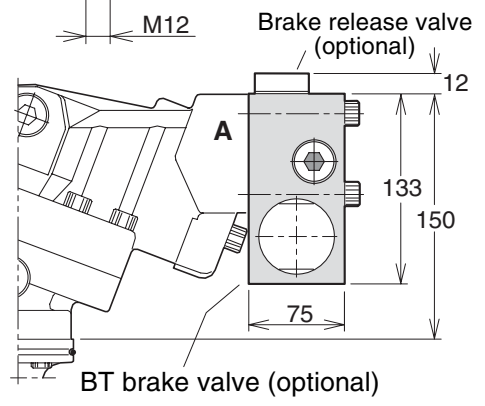
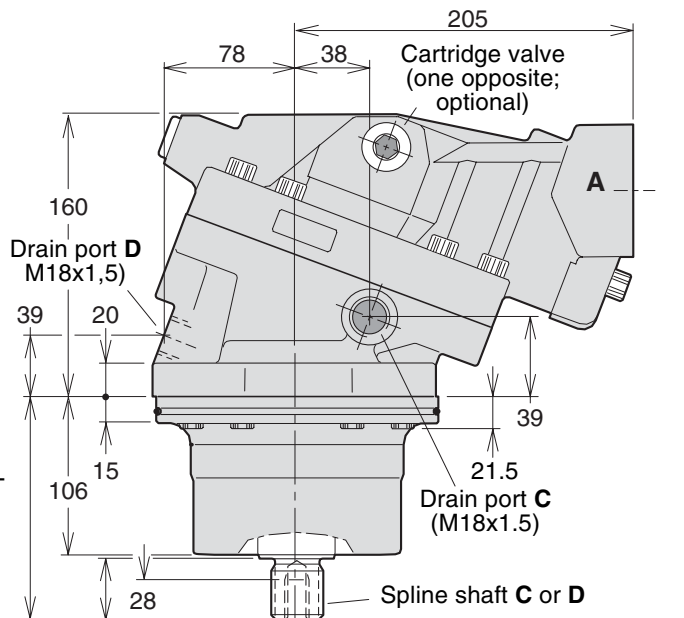
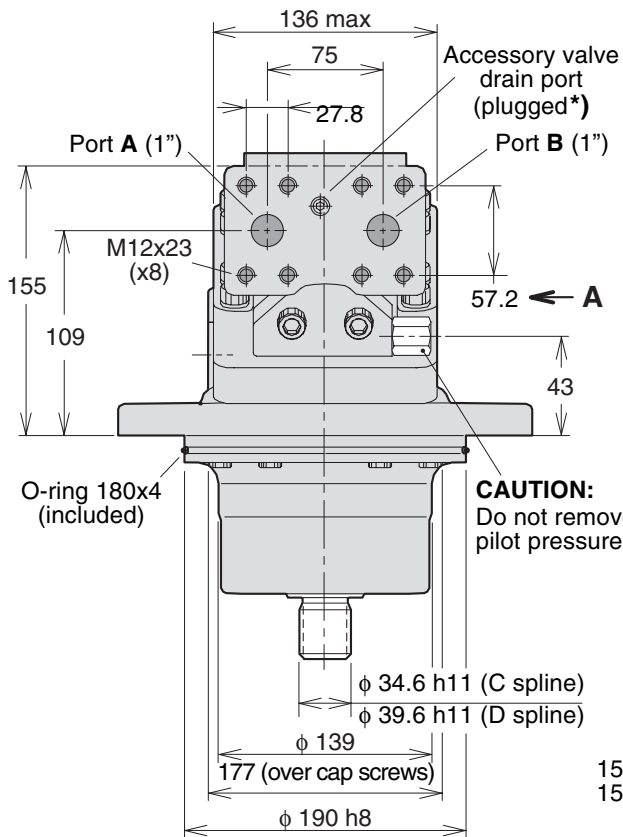
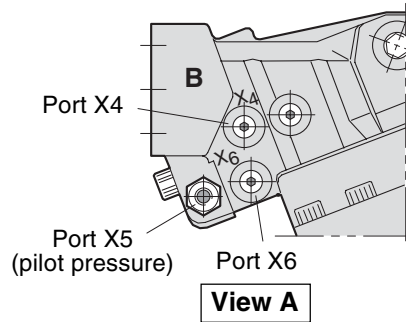
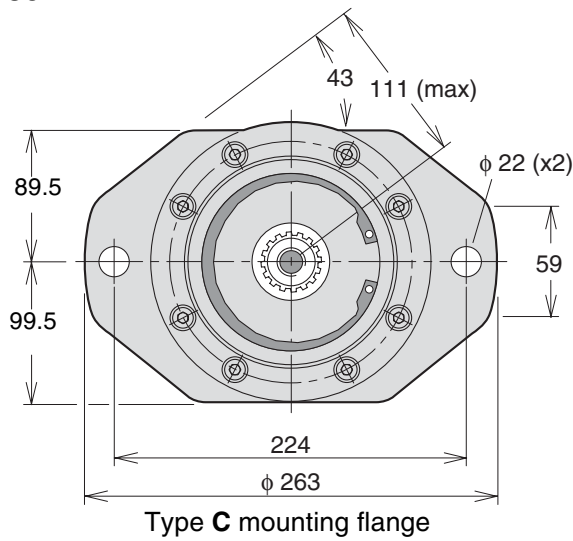
For further information, refer to 'Mobile motor/pumps accessories', catalogue HY17-8258/UK.

Spline ¹⁾	C (standard)	D (optional)
T12-60	W30x2x14x9g	W35x2x16x9g

1) DIN 5480 ('30° involute spline, side fit').



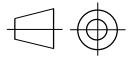
T12-80



*** NOTE:**
 The accessory valve drain port plug **must be removed** before installing one of the following valves:
 - **BT** brake valve (with flushing valve 'L' and/or brake release funktion 'B')
 - **FV** flushing valve.
 For further information, refer to 'Mobile motor/pumps accessories', catalogue HY17-8258/UK.

Spline ¹⁾	C (standard)	D (optional)
T12-80	W35x2x16x9g	W40x2x18x9g

1) DIN 5480 ('30° involute spline, side fit').





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Direction of rotation versus flow

NOTE: The V12, V14 and T12 motors are bi-directional.

V12 rotation:

- End cap position **T** (AC, AD and AH controls): When port B (open arrow) is pressurized, the motor rotates clockwise (right hand; R), and when port A (black arrow) is pressurized, the motor turns counter clockwise (left hand; L)
- End cap position **M** (EO, EP, HO and HP controls): A and B port positions interchange (A-to-B, B-to-A).

V14 rotation:

- Refer to the V14 illustration below right (valid for all compensators and controls).

T12 rotation:

- Refer to the V14 illustration below right.

NOTE: Before installing a V12, V14 or T12 motor in series (when both A and B ports can be subject to high pressures simultaneously) contact Parker Hannifin.

Filtration

Maximum motor service life is obtained when the fluid cleanliness meets or exceeds ISO code 18/13 (ISO 4406). A 10 µm (absolute) filter is recommended.

Case pressure

The lowest and highest recommended case pressure (shaft seal type **H**) at selected shaft speeds is shown in the table below.

The min pressure secures sufficient lubrication, and the max pressure nominal seal life.

Case pressure should be measured in the drain port.

NOTE: Contact Parker Hannifin for information when operating at high speeds.

Frame size	1500	3000	4000	5000	6000
V12-60	max 12	0.5-7	1-5.5	1.5-5	2-5
V12-80	max 12	0.5-7	1-5.5	1.5-5	2.5-5
V12-160	max 10	1-6	1.5-5	2-4.5	-
V14-110	max 10	1-6	1.5-5	2-4.5	3-5
V14-160	max 10	1-6	2-5.5	2.5-5.5	-

Min and max case pressure [bar] vs. shaft speed [rpm].

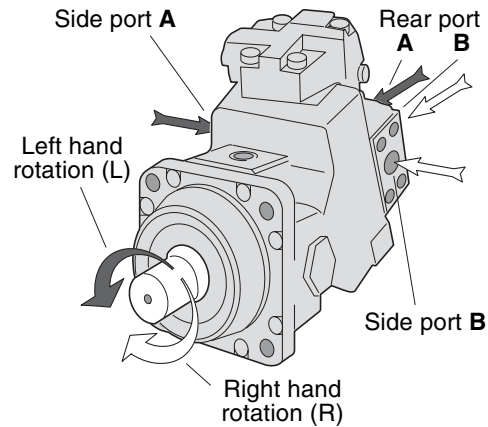
NOTE: Contact Parker Hannifin for information on other shaft seals.

Required inlet pressure

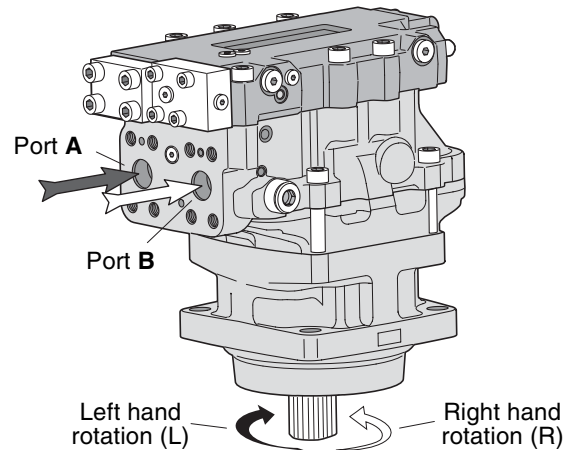
The motor may operate as a pump under certain conditions. When this occurs, a minimum pressure must be maintained at the inlet port; increased noise and gradually deteriorating performance due to cavitation may otherwise be experienced.

A 15 bar inlet pressure, measured at the motor inlet port, satisfies most operating conditions.

Contact Parker Hannifin for more specific information on inlet pressure requirements.



Direction of rotation vs. flow for the V12 motor (here shown with AC-compensator; end cap position T).



Direction of rotation vs. flow for the V14 motor (shown with AC-compensator).

Operating temperatures

The following temperatures should not be exceeded (type **H** shaft seal):

Main circuit: 80 °C.

Drain fluid: 100 °C.

FPM shaft seals (fluorocarbon; type **V**) can be used to 115 °C drain fluid temperature.

Continuous operation at high power levels usually requires case flushing in order for the fluid to stay above the minimum viscosity requirement. A flushing valve and restricting nozzle, available as an option, provide the necessary main circuit flushing flow.

Refer to fig. 1 (next page), and to:

- V12: 'Flushing valve', page 28.
- V14: 'Flushing valve', page 53
- T12: 'Flushing valve block', page 59.

Drain ports

There are two drain ports on the V12, V14 and T12 motors. The uppermost drain port should always be utilized (see illustrations on the previous page).

In order to avoid excessively high case pressure, the drain line should be connected directly to the reservoir.

When the motor is operating, the case must be filled with fluid to at least 50%.

NOTE: - A spring loaded check valve in the drain line (shown in the V14 illustrations to the right) may have to be installed in order to prevent oil from being siphoned out of the motor case. This can otherwise happen if, e.g., the reservoir is located below the utilized motor drain port.

- 'High speed operation' available from Parker Hannifin.

Hydraulic fluids

Ratings and performance data for the motors are valid when a good quality, contamination-free, petroleum-based fluid is used in the hydraulic system.

Hydraulic fluids type HLP (DIN 51524), automatic transmission fluids type A, or API CD engine oils can be used.

When the hydraulic system has reached full operating temperature, the motor drain oil viscosity should be above 8 mm²/s (cSt).

At start-up, the viscosity should not exceed 1500 mm²/s.

The ideal operating range for the motor is 15 to 30 mm²/s.

Fire resistant fluids, when used under modified operating conditions, and synthetic fluids are also suitable.

Contact Parker Hannifin for additional information about:

- Hydraulic fluid specifications
- Fire resistant fluids.

Before start-up

Make sure the motor case as well as the entire hydraulic system is filled with hydraulic fluid.

The internal leakage, especially at low operating pressures, is not sufficient to provide lubrication at start-up.

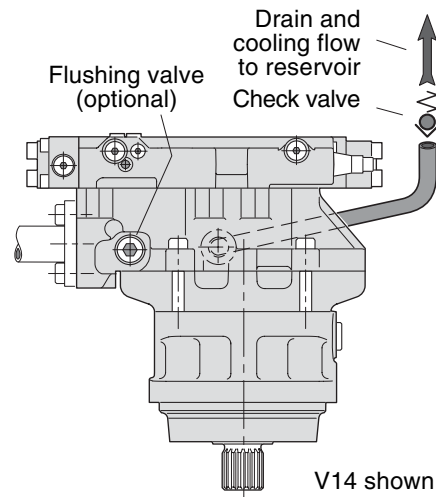


Fig. 1.

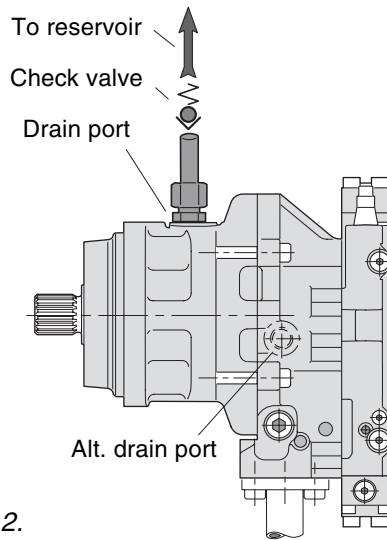


Fig. 2.

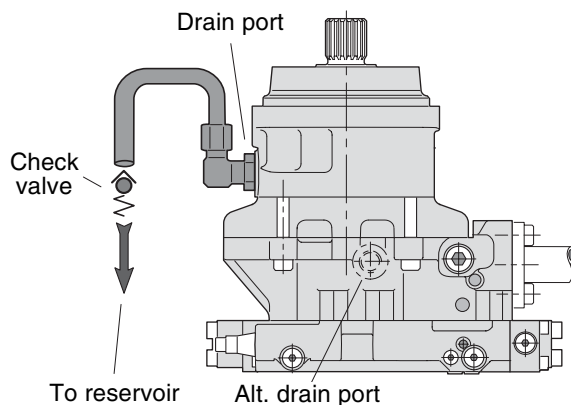
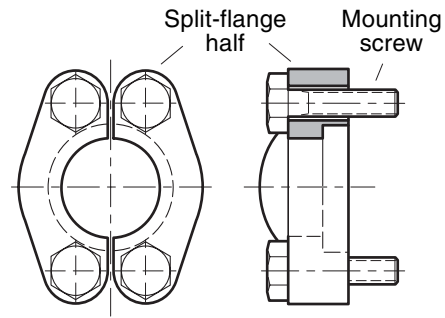


Fig. 3.

Split-flange kits

Metric split-flange kits, consisting of two split-flange halves and four mounting screws for use on V12 ISO and cartridge versions, are available from Parker Hannifin.

Part no.	SAE size	For	Screw size
379 4405	3/4"	V12-60/-80	M10x35
370 4330	1 1/4"	V12-160	M14x45
370 4329	1"	V14-110	M12x40
370 4330	1 1/4"	V14-160	M14x45
379 4405	3/4"	T12-60/-80	M10x35





WARNING

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