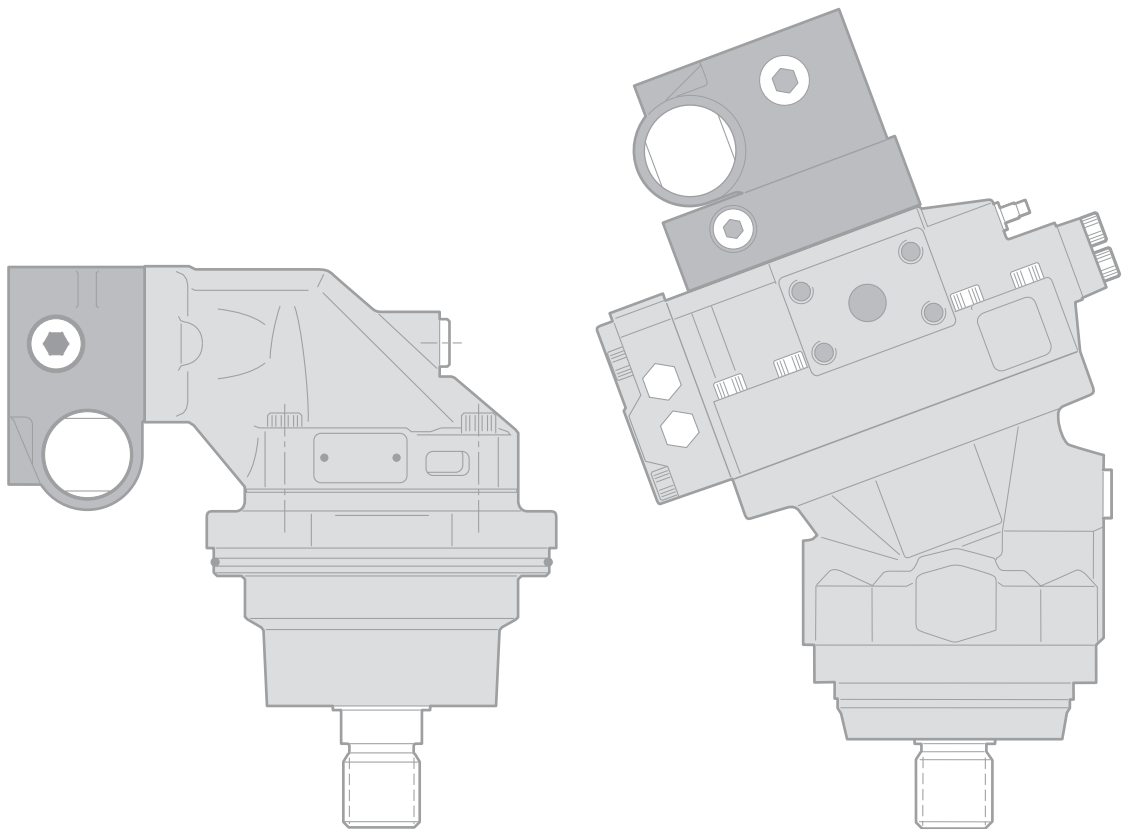




Mobile motor/pump accessories

*Catalogue HY17- 8258/UK
November 2004*



General information

In an open circuit, hydraulic propulsion system, there is a risk of cavitation when the vehicle is going downhill or is being braked. Cavitation occurs when the speed of the motor corresponds to a higher flow than what is available. This condition may lead to a complete loss of the hydraulic braking torque and also to motor deterioration.

When installed correctly, the BT brake valve prevents cavitation by throttling the return line from the motor as soon as the differential pressure between the inlet and return lines decreases to a specific value.

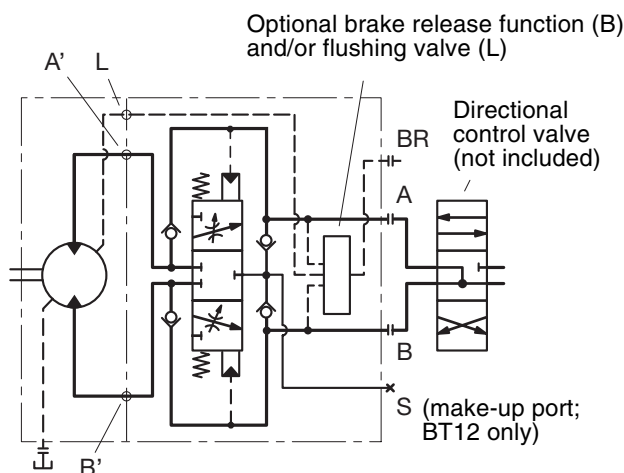
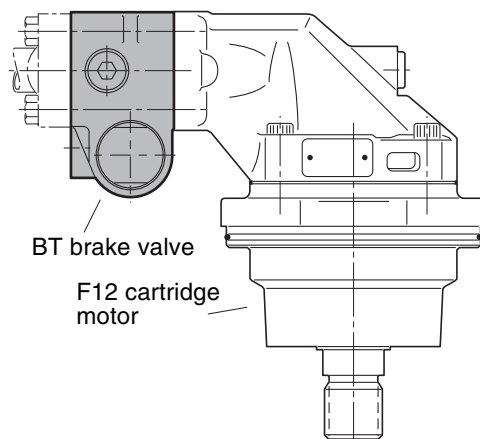
The BT brake valve consists mainly of a spool valve. The position of the spool is determined by the differential pressure. When the differential pressure decreases and approaches 35 bar (500 psi), the spool begins to close the port connected to the return line. It leads to pressure build-up on the return side of the motor, which gives a braking torque.

The BT brake valve makes sure the speed of the motor is in balance with the supplied flow. The special check valve arrangement on the pump side of the brake valve gives extra protection against cavitation. If the supply pressure drops below the return line pressure, fluid is fed directly back to the motor inlet.

The BT brake valve is very compact and installs between the F12 or T12 port flange and the main line split-flanges.

NOTE: - Before designing a system with a BT brake valve, Product Support (Pumps & Motors) should be contacted.

- When utilizing the flushing valve (L) and/or the brake release function (B), make sure the F12 is ordered with the third drain connection. On the T12, the third drain line plug must be removed before installing the BT valve.



Hydraulic schematic (F12 motor with BT brake valve).

IMPORTANT

When ordering, a filled-in 'BT brake valve specification form' (MI 119) must be attached.

Ordering code

Example:

Valve function **BT** Brake valve (for track drives)

Version **2** Issued by Parker Hydraulics

Main ports (SAE 6000 psi) **1** 3/4" (for F12-30/-40/-60, T12-60)
2 1" (for F12-80, T12-80, V12-110)

Spool configuration **11** Standard

Valve damping, etc. **14** Standard

BT 2 1 - 11 14 - L B V5 - A N

Seals

N Nitrile

V FPM (optional)

Spring cover location

A At port A (as shown on page 3)

B At port B

Optional functions

L Flushing valve

B Brake release function

V5 Check valve (5 bar spring)



Brake valve

The diagrams to the right show the pressure drop, motor to return line (refer to the schematic on page 1) when the brake valve spool is completely open.

To keep the brake valve completely open, the pressure differential between ports A and B must be at least 35 bar (500 psi).

If this differential tends to decrease, i.e. when the vehicle is going downhill or whenever the driver decides to decrease the speed, the valve closes sufficiently to maintain the speed or slow down the vehicle, and the Δp will be higher than shown in the diagrams.

Cold-start function

It is well known that, due to high viscosity when operating in the low temperature range, the response time of the brake valve of e.g. the left hand motor in a propel drive can be different from that of the brake valve of the right hand motor.

This means that one of the brake valves opens before the other which, in turn, means that the machine doesn't start to move in a straight forward direction.

To correct this situation, the BT valve is supplied with a cold start function which makes the brake valves open simultaneously when starting; the machine will then go straight forward independent of oil viscosity.

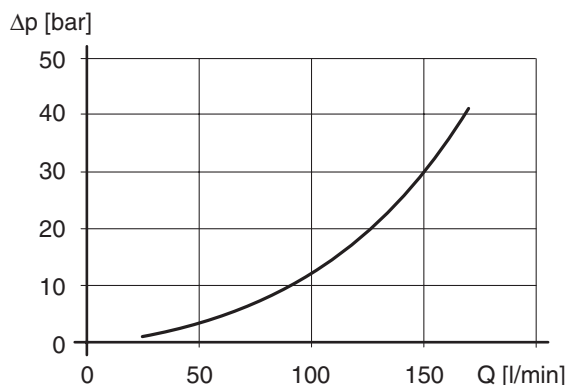
Check valves

The check valve characteristics for series BT are shown in the diagram below right.

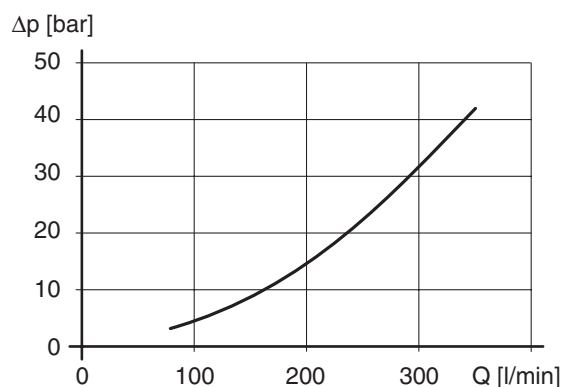
Brake release function

The BT brake valve can be ordered with a brake release function. If, for example, an F12 motor with BT valve is installed on a planetary gearbox, the BR port is connected to the brake release port. When the motor is started, the BR port is pressurized and the gearbox disc brake is automatically released.

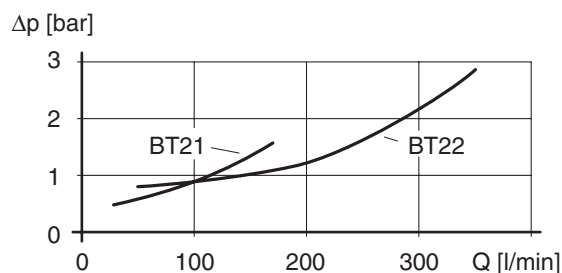
The bottom right diagram illustrates the BT brake release characteristic (port BR pressure vs. Δp between the main ports) at 10 bar (150 psi) return line pressure.



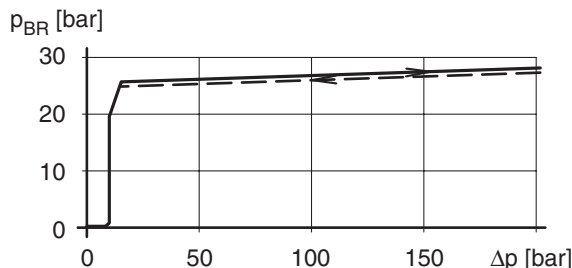
BT21 brake valve characteristic (A' to A; B' to B).



BT22 brake valve characteristic (A' to A; B' to B).



BT check valve characteristic (A to A'; B to B').



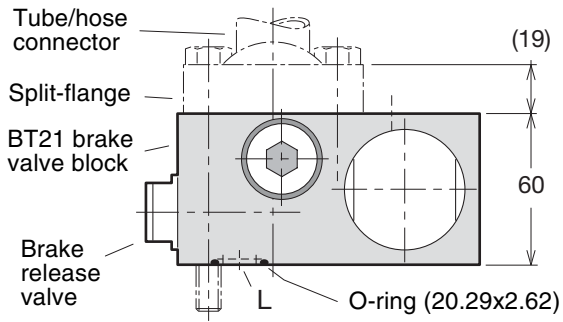
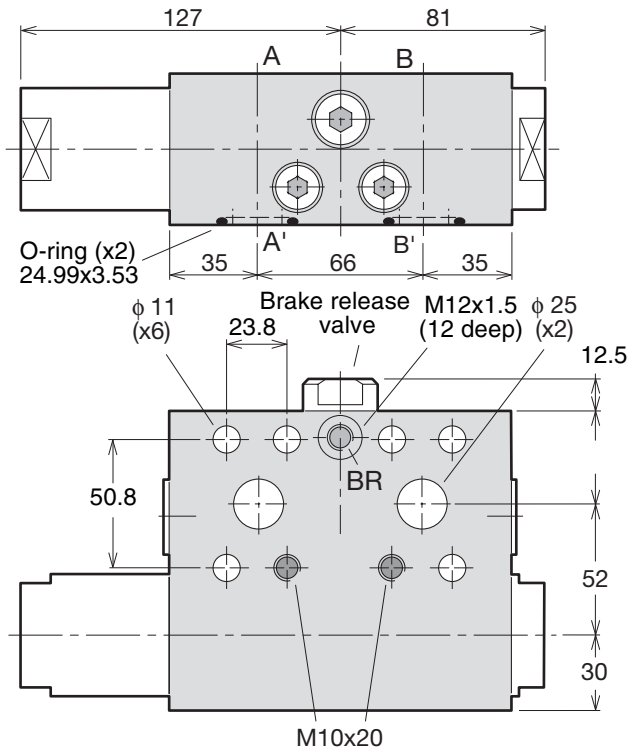
BT brake release valve characteristic.

IMPORTANT

The vehicle must be provided with a mechanical braking system which is independent of the **open loop type** hydrostatic transmission.

(continued on page 10)

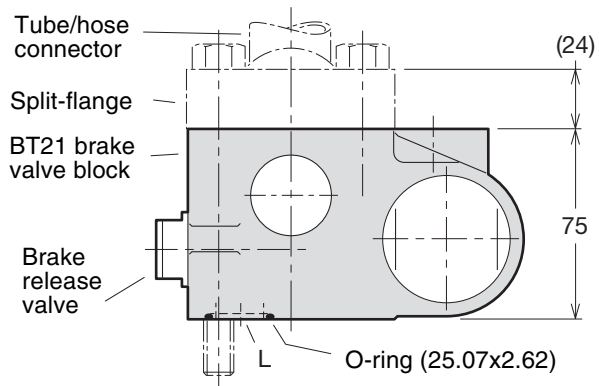
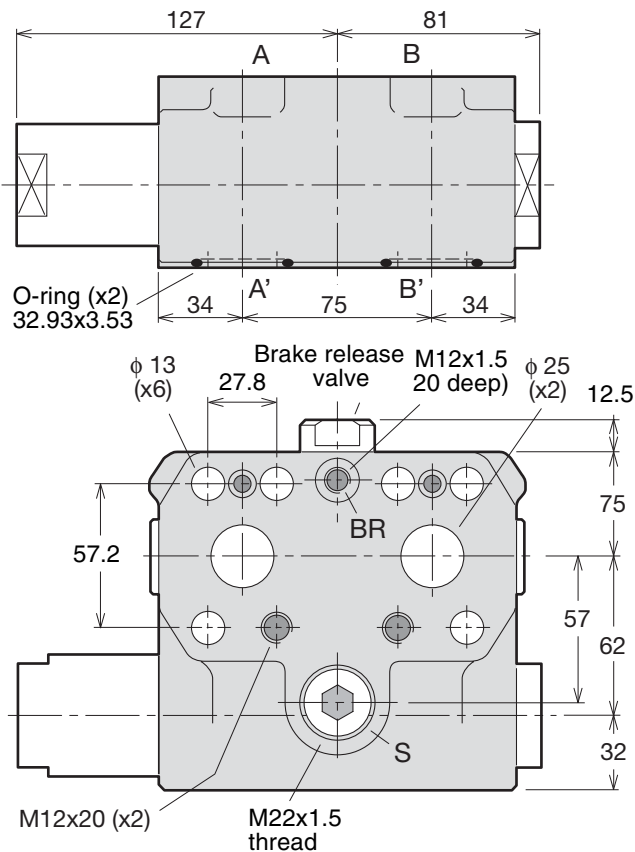
BT21 installation



Installation information

- 1) The BT21 brake valve block flange mounts between the motor main port flange and the split-flange tube/hose connections utilizing six M10x100 and two M10x40 screws (with 19 mm split-flanges as shown).
O-rings are provided (but no screws, split-flanges or tube/hose connectors).
When utilized, make sure port **L** connects with the corresponding port on the motor.
- 2) When factory mounted, the BT21 brake valve block is attached to the motor with two M10x75 screws.

BT22 installation



Installation information

- 1) The BT22 brake valve block flange mounts between the motor main port flange and the split-flange tube/hose connections utilizing six M12x120 and two M12x40 screws (with 24 mm split-flanges as shown).
O-rings are provided (but no screws, split-flanges or tube/hose connectors).
When utilized, make sure port **L** connects with the corresponding port on the motor end cap.
- 2) When factory mounted, the BT22 brake valve block is attached to the motor with two M12x90 screws.