Parker
Mobile Hydraulics

Hydraulic Pump Series F2plus

Fixed Displacement

Catalogue HY17-8253/UK
February 2001

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Conversion	**factors**
1 kg	2.20 lb
1 N	0.225 lbf
1 Nm	0.738 lbf ft
1 bar	14.5 psi
1 l	0.264 US gallon
1 cm^3	0.061 cu in
1 mm	0.039 in
$^9/_5$ °C + 32	1 °F

Twin-flow pump series F2*plus*

Series F2*plus* is a further development of the twin-flow version of series F1, the very first bent-axis truck pump on the market to feature two entirely independent flows.

With a suitable build-up of the hydraulic system, the main advantage with a twin-flow pump is that three different flows can be provided at the same engine speed.

The twin-flow pump makes it possible to further optimize the hydraulic system and offers:

- Less energy consumption
- Reduced risk of system overheating
- Lower weight
- Easier installation
- Standardized system solutions

The twin-flow pump makes it possible to operate two work functions that are independent of each other which leads to higher speed and an increased operating precision. Another requirement can be a large and a small flow, or two equal flows. All of these alternatives are possible with the twin-flow pump.

The pump can be utilized to provide one flow at high system pressure, and, as soon as the pressure has decreased sufficiently, add the flow from the other circuit. This eliminates the risk of exceeding the PTO power rating and, at the same time, provide an optimal driving function.

Typical twin-flow applications

- Large truck loaders
- Forestry cranes
- Hook loaders/lift dumpers
- Tipper/crane combinations
- Refuse collecting vehicles

The pump shaft end/mounting flange meets the ISO standard and suits PTO direct mounting.

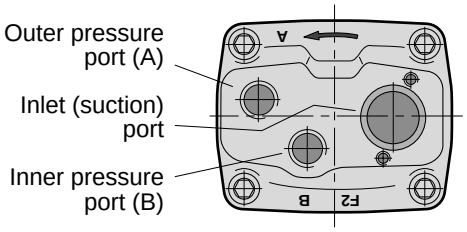
Suitable PTO:s for most European truck gearboxes are available from our sales offices and distributors.

Specifications

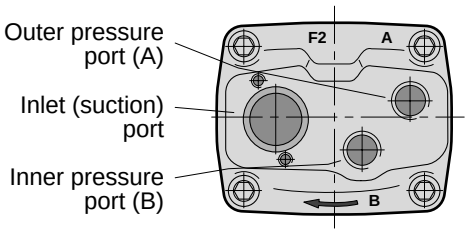
Frame size	**F2-53/53**	**F2-70/35**
Displacement [cm³/rev]		
Port A	54	69
Port B	52	36
Max operating pressure [bar]	350	350
Max shaft speed [rpm] (unloaded pump; low pressure)	2550	2550
Max selfpriming speed [rpm]		
Ports A[1) 2)] and B[1) 2)] pressurized	1800	1800
Port A[2)] unloaded, pressure in port B	2100	2100
Input power [kW]		
Max intermittent[3)]	110	110
Max continuous	88	88
Weight [kg]	19	19

1) Valid with $2\frac{1}{2}$" inlet (suction) line; with 2" inlet line: max 1400 rpm.
2) Measured at 1.0 bar abs. inlet pressure.
Please note: A lower inlet pressure affects pump performance.
3) Max 6 seconds in any one minute

'Left hand' and 'right hand' end caps



End cap for right hand rotating pump



End cap for left hand rotating pump

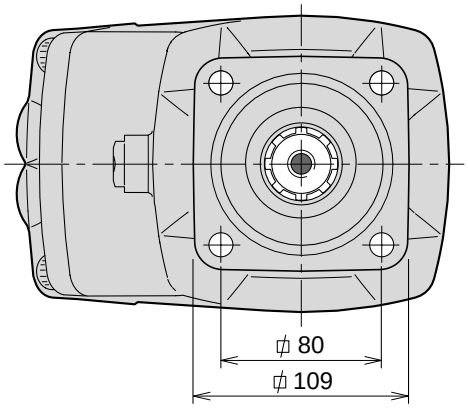
Flow vs. shaft speed (theoretical)

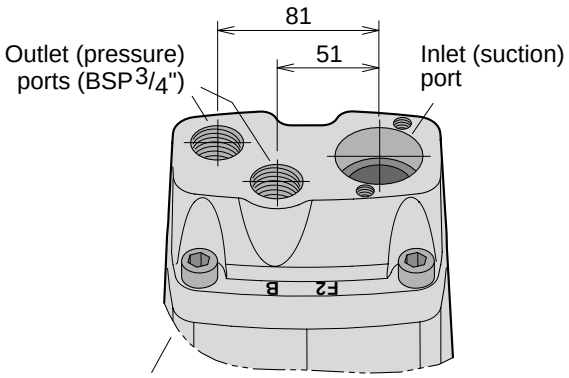
Pump speed [rpm]	800	1000	1200	1400	1600	1800	1900	2000	2100
F2-53/53 flow [l/min]									
Port A	43	54	65	76	86	97	-	-	-
Port B	42	52	62	73	83	94	99	104	109
Total (ports A + B)	85	106	127	149	169	191	-	-	-
F2-70/35 flow [l/min]									
Port A	55	69	83	97	110	124	-	-	-
Port B	29	36	43	50	58	65	68	72	76
Total (ports A + B)	84	105	126	147	168	189	-	-	-

Shaft torque vs. pressure (theoretical)

Pressure [bar]	150	200	250	300	350
F2-53/53 torque [Nm]					
Port A	126	168	210	252	294
Port B	124	165	206	248	289
Total (ports A and B)	250	333	416	500	583
F2-70/35 torque [Nm]					
Port A	164	219	274	329	383
Port B	86	114	143	171	200
Total (ports A and B)	250	333	417	500	583

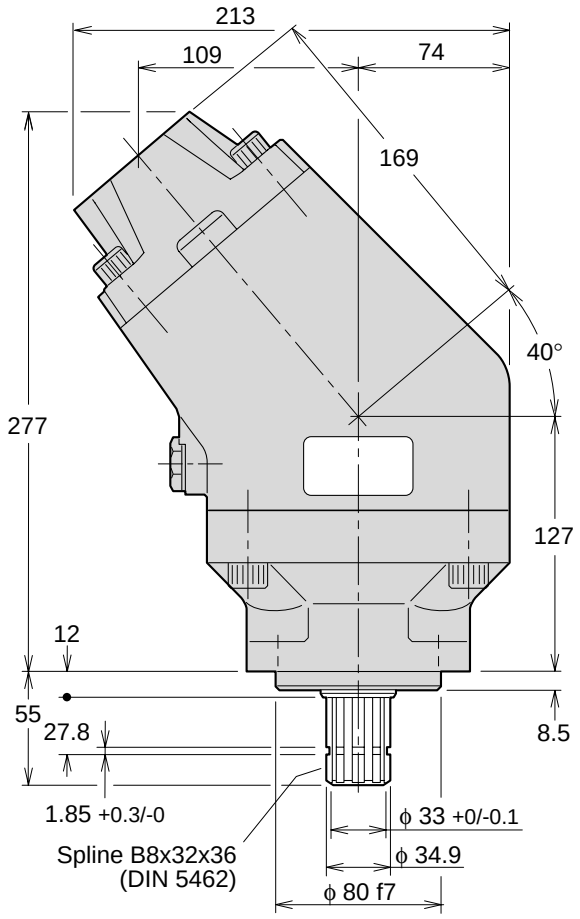
Installation dimensions



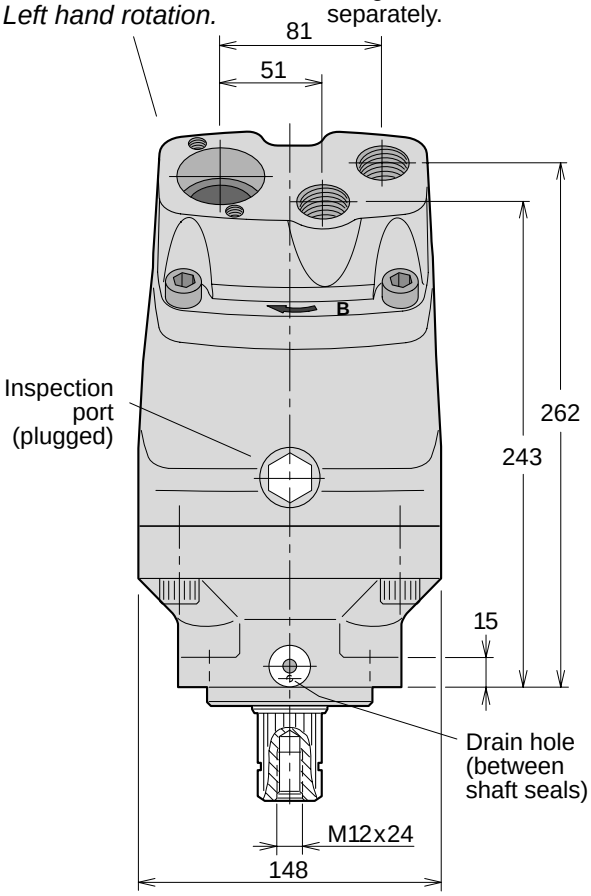


Right hand rotation.

NOTE: The F2*plus* pump does not include a suction fitting; it must be ordered separately.



Left hand rotation.



Ordering information

Example: **F2 - 53/53 - L**

Frame size [cm³/rev]
53/53
70/35

Direction of rotation
L Left hand
R Right hand

Standard versions

Designation	Ordering no.
F2-53/53-R	378 1453
F2-53/53-L	378 1454
F2-70/35-R	378 1470
F2-70/35-L	378 1471

NOTE:
- Before start-up, tighten the inspection port plug to 70–100 Nm.
- To change the direction of rotation, **the end cap must be replaced.**

Accessories

BPV-F2 electrical bypass valves

The BPV-F2 bypass valve (only suitable for series F2 pumps) controls the two pump flows independently.

The valve can be utilized for left hand and right hand pumps. It is installed directly on the pump end cap with two pressure connectors and suction fitting clamp screws which makes for a very compact assembly.

The valve is controlled by two solenoids (24 or 12 VDC); refer to the schematic to the right.

Design.	Order. nr.	Note
Valve kit*	**378 1459**	**24 VDC solenoid; standard**
Valve kit*	378 1567	12 VDC solenoid; optional
O-ring kit	378 0641	For F1*plus* and F2*plus*

***** Contains parts designated '**1**' in the split view below right.

NOTE: - The valve must not be operated when system pressure is above 20 bar.

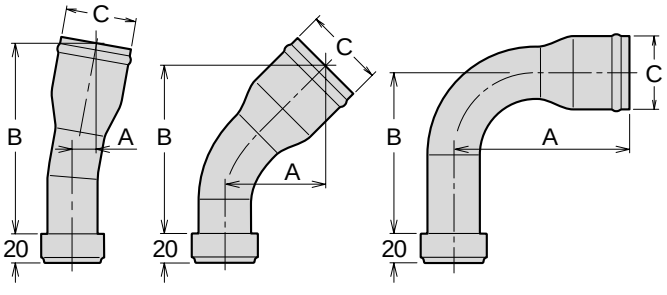
- In order to secure a cooling oil flow through the circuit, a separate drain line ***must*** be connected from the BPV-F2 drain line fitting (shown in the split view) directly to tank; refer also to the schematic.
- The pressure connectors must be tightened (to 100 Nm) before the suction fitting clamp screws.
- Additional information (specifications, installation dimensions and other important information) is provided in our 'Truck Accessories' publication (catalog no. HY17-8242/UK, page 16).

Suction fittings

A 'suction fitting' consists of a straight, 45° or 90° suction fitting, 2 clamps, 2 cap screws and an O-ring (parts designated ***'2'*** in the bypass valve split view to the right).

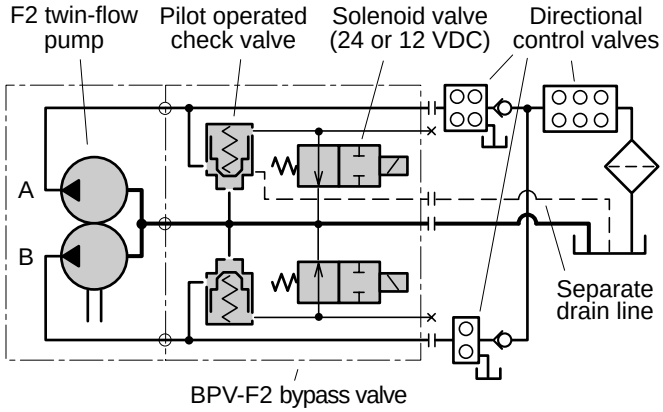
Our 'Truck Accessories' publication (catalog no. HY17-8242/UK, page 3) provides additional information.

Type	Order. nr.	A mm	B mm	C mm *(in.)*
'Straight'	378 0636	17	136	50 *(2")*
"	378 0637	25	145	63 *($2^1/_2$")*
45°	378 0364	67	110	50 (2")
"	378 0634	75	117	63 ($2^1/_2$")
90°	378 0979	135	83	50 *(2")*

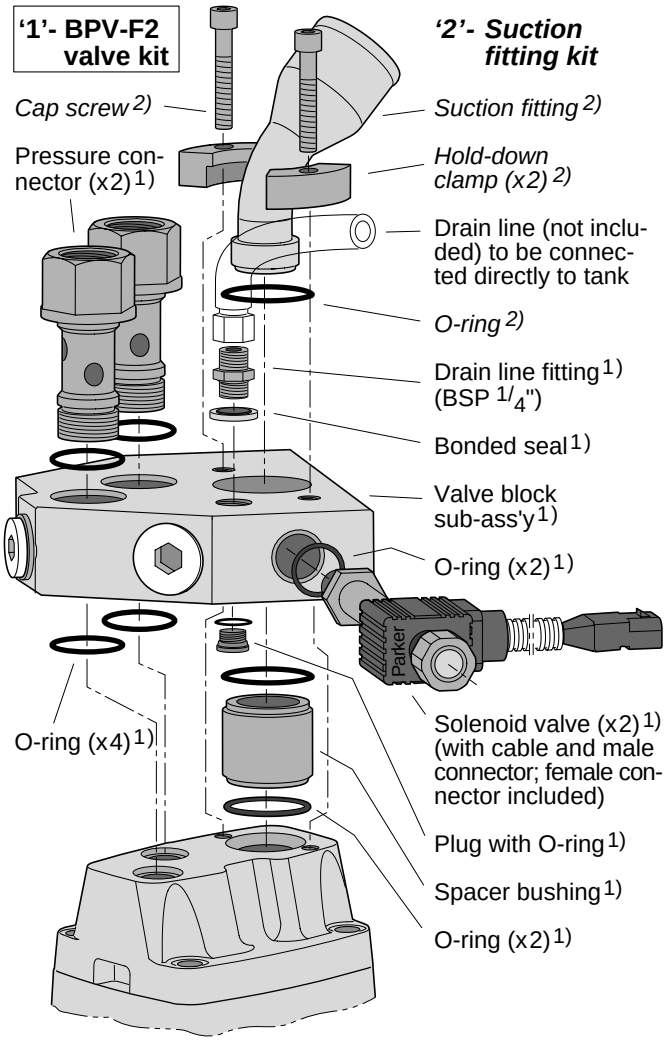


'Straight' fitting 45° fitting 90° fitting

Suction fittings.



Bypass valve circuit schematic (example).



Bypass valve split view (with F2plus end cap).

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

Parker Mobile Hydraulics

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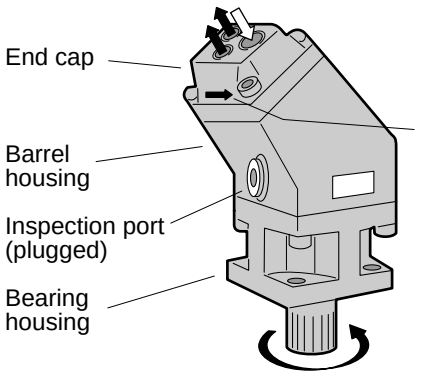
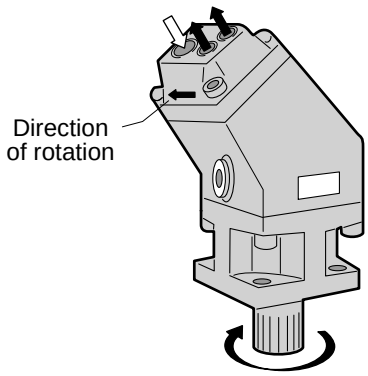
Mobile Controls Division
Trollhättan, Sweden

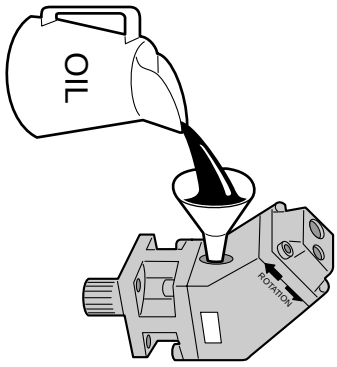
Installation and start-up



Right hand rotation.



Left hand rotation.



Before start-up, the housing must be filled with hydraulic fluid.

Direction of rotation

The above illustrations show flow vs. shaft rotation for left hand and right hand pump versions respectively.

The F2 twin flow pump is designed for left hand or right hand rotating PTO's. In order to change the direction of rotation of the pump, the pump end cap must be replaced.

Installation

The robust shaft bearings of the pump allows the F2 to be installed on a bracket (driven by a cardan shaft) or directly on the PTO.

Fig. 2 shows two ways of installing a gear on the F2 shaft. On a non-geared PTO or a geared PTO with support bearings, the pump shaft is usually installed directly in the internally splined PTO output shaft.

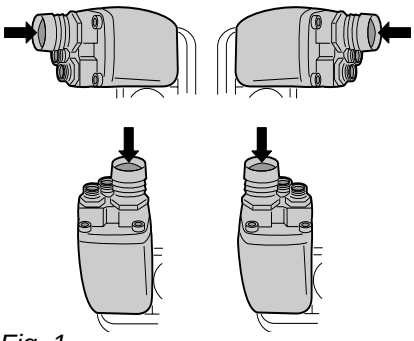


Fig. 1.

NOTE:

- The inlet (suction) port should always be above the pressure port when the pump is installed above the reservoir oil level (fig. 1).
- During operation, the pump must be filled with oil to at least 50%.

Hydraulic fluids

The F2 data shown in the specifications on page 4 are valid when operating on a high quality, mineral based fluid.

Hydraulic fluids type HLP (DIN 51524), ATF (automatic transmission fluids), and API type CD engine oils are suitable.

Fluid temperature

Main circuit: Max 75 ˚C.

Viscosity

Recommended viscosity:
20 to 30 mm^2/s (cSt).

Operating viscosity limits:
10 - 400 mm^2/s.

At start-up: Max 1000 mm^2/s.

Drain line

F2 pumps don't need a drain line as they are internally drained.

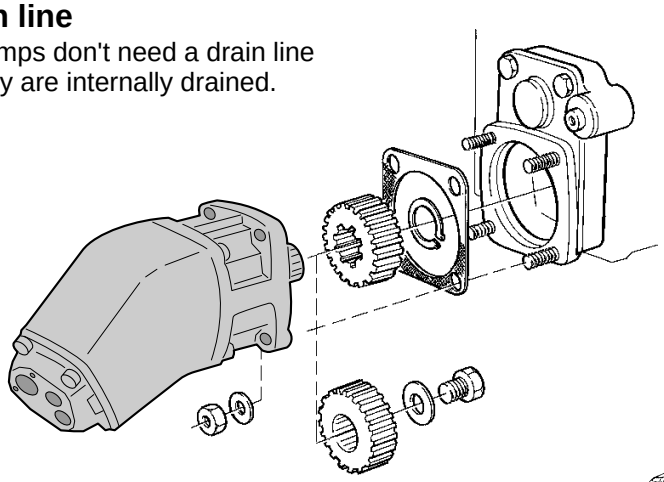


Fig. 2.

IMPORTANT

Force must ***never*** be used when installing a coupling, a sleeve or a gear on the F2 pump shaft.

The tool shown in fig. 3 facilitates the installation (our P/N 370 6851).

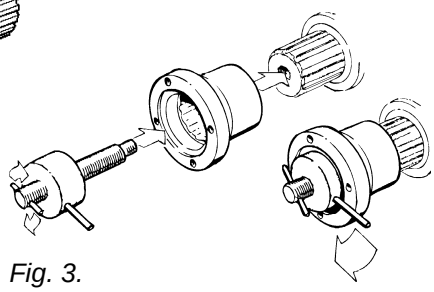


Fig. 3.

Filtration

To obtain long F2 life, we recommend a filtration level of:

- 25 μm (absolute) in clean environment or at low pressures
- 10 μm (absolute) in contaminated environment or at high pressures

Filtration should meet ISO standard 4406, code 18/13.

Start-up

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

The pump must also be filled as the internal leakage does not provide sufficient lubrication at start-up.

Please contact our sales representative:

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