F1 Pump ISO



Series F1 is a further development of our well known 'truck pump', the F1. The F1 offers many additional values for operators of cargo cranes, hook loaders, skip loaders, forest cranes, concrete mixers and similar truck applications.

Series F1 is a very efficient and straight forward pump design with unsurpassed reliability.

Its small envelope size gives a simple and inexpensive installation.

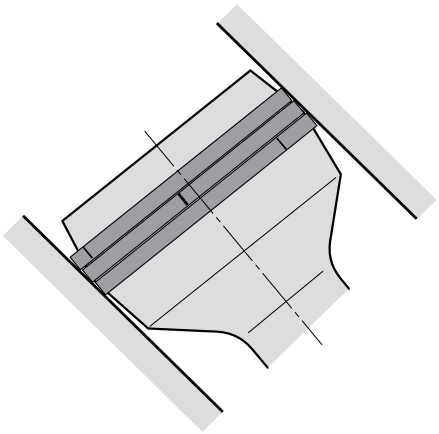
Features of the F1 are:

- High selfpriming speeds
- Operating pressures up to 400 bar
- High overall efficiency
- Low noise level
- Small installation dimensions
- Low weight

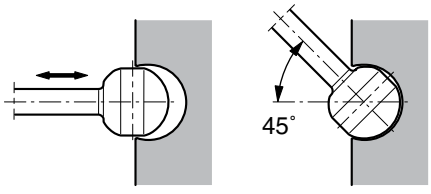
... thanks to:

- 45° bent-axis angle
- Optimal inlet port geometry in the end cap
- Single housing design
- Spherical pistons - high speeds
- Laminated piston rings - low leakage
- Positive synchronisation with timing gear
- Installation above the reservoir level possible
- Tolerates low temperatures and high temperature shocks
- Shaft end and mounting flange meet the ISO standard for all sizes

See page 22



F1 piston with laminated piston ring.



F1 piston-to-shaft locking.

Parker Hannifin
Pump & Motor Division Europe
Trollhättan, Sweden

F1 Pump SAE



Features:

- Laminated piston rings - low leakage
- Positive synchronisation with timing gear
- Operating pressure up to 350 bar
- Installation above the reservoir level possible
- Tolerates low temperatures and high temperature shocks
- Shaft end and mounting flange meet the standard SAE-B
- 4 sizes -25 / -41 / -51 / -61 cm^3/rev

See page 30

F1 Motor ISO



Features:

- Laminated piston rings - low leakage
- Positive synchronisation with timing gear
- Operating pressure up to 250 bar
- Tolerates low temperatures and high temperature shocks
- Shaft end and mounting flange meet the ISO standard for all sizes
- Tolerates high acceleration

See page 37

F1 Pump

F1-ISO



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F1-25 to -101, ISO

Specifications

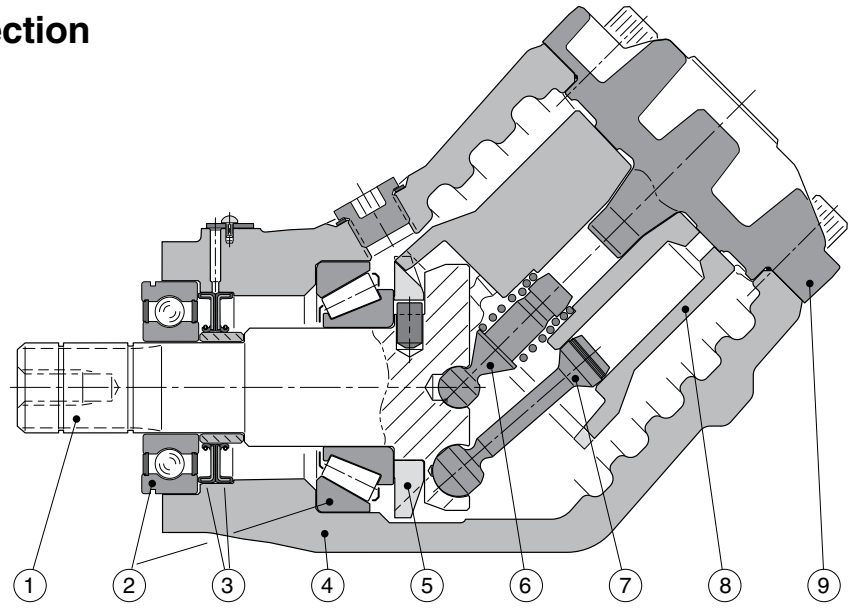
Frame size F1-	25	41	51	61	81	101
Displacement [cm³/rev]	25.6	40.9	51.1	59.5	81.6	102.9
Max flow 1) [l/min]	78	104	125	143	180	216
Max operating pressure [bar]	400	400	400	400	400	400
Mass moment of inertia J [kgm²]	0,00274	0,00266	0,00261	0,00257	0,00532	0,00524
Shaft speed [rpm]						
- short circuited pump (low press.)	3100	2700	2700	2700	2300	2300
- max selfpriming speed 2)	3050	2550	2450	2400	2200	2100
Torque 1) [Nm]	163	260	324	378	518	653
Max input power 3) [kW]	45	61	73	83	105	126
Weight [kg]	8.5	8.5	8.5	8.5	12.5	12.5

1) Theoretical values
2) Valid at an inlet pressure of 1.0 bar (abs.) when operating on mineral oil at a viscosity of 30 mm²/s (cSt).
3) Max 6 seconds in any one minute.

NOTE: For noise level information, contact Parker Hannifin

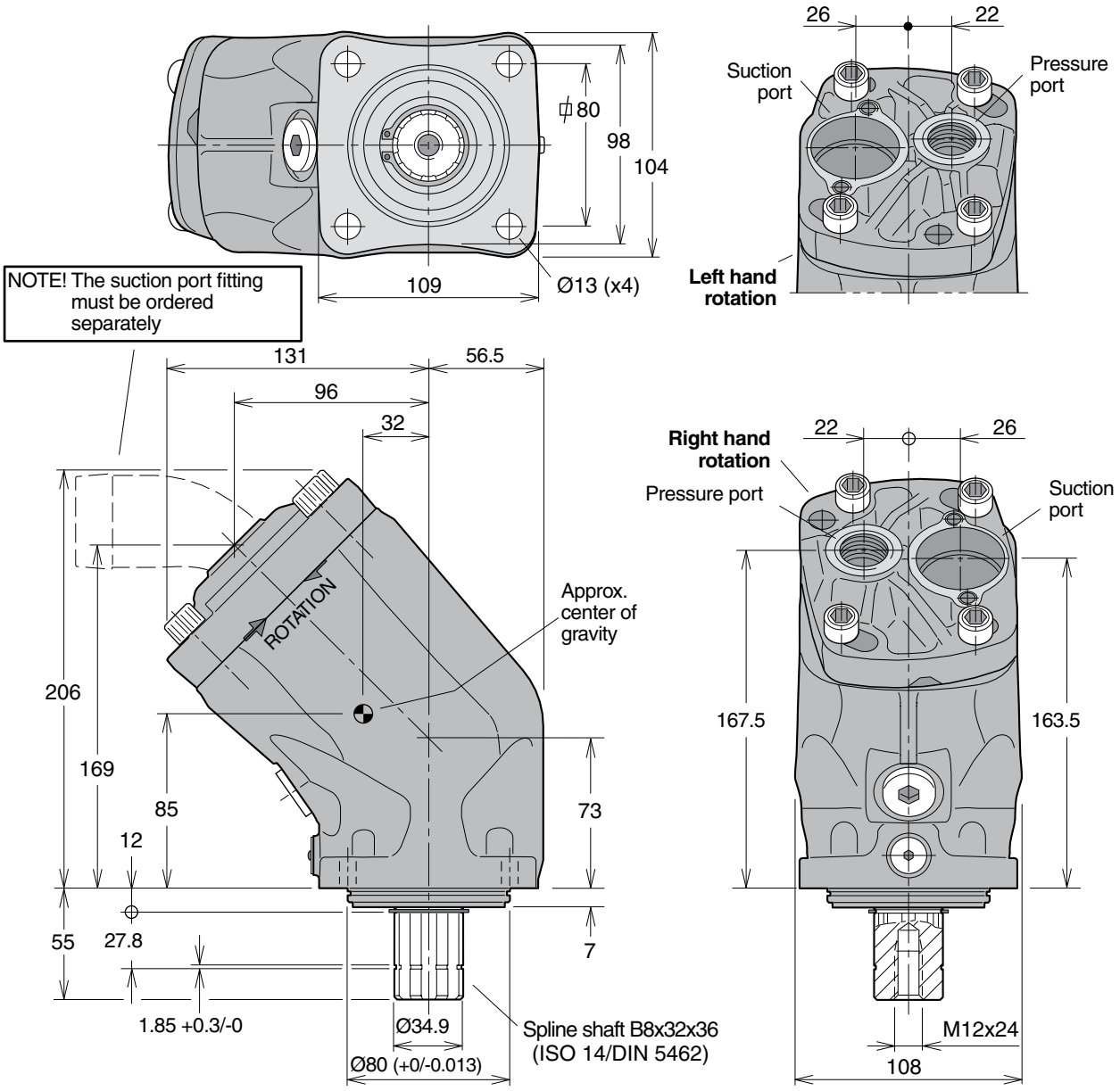
4

Pump cross section



1. Input shaft
2. Bearings
3. Shaft seals
4. Housing
5. Timing gear
6. Barrel support
7. Piston with piston ring
8. Cylinder barrel
9. End cap

F1-25, -41, -51 and -61



Ordering code

Example: **F1- 81 - R**

F1 frame size
25, 41, 51, 61, 81 or 101

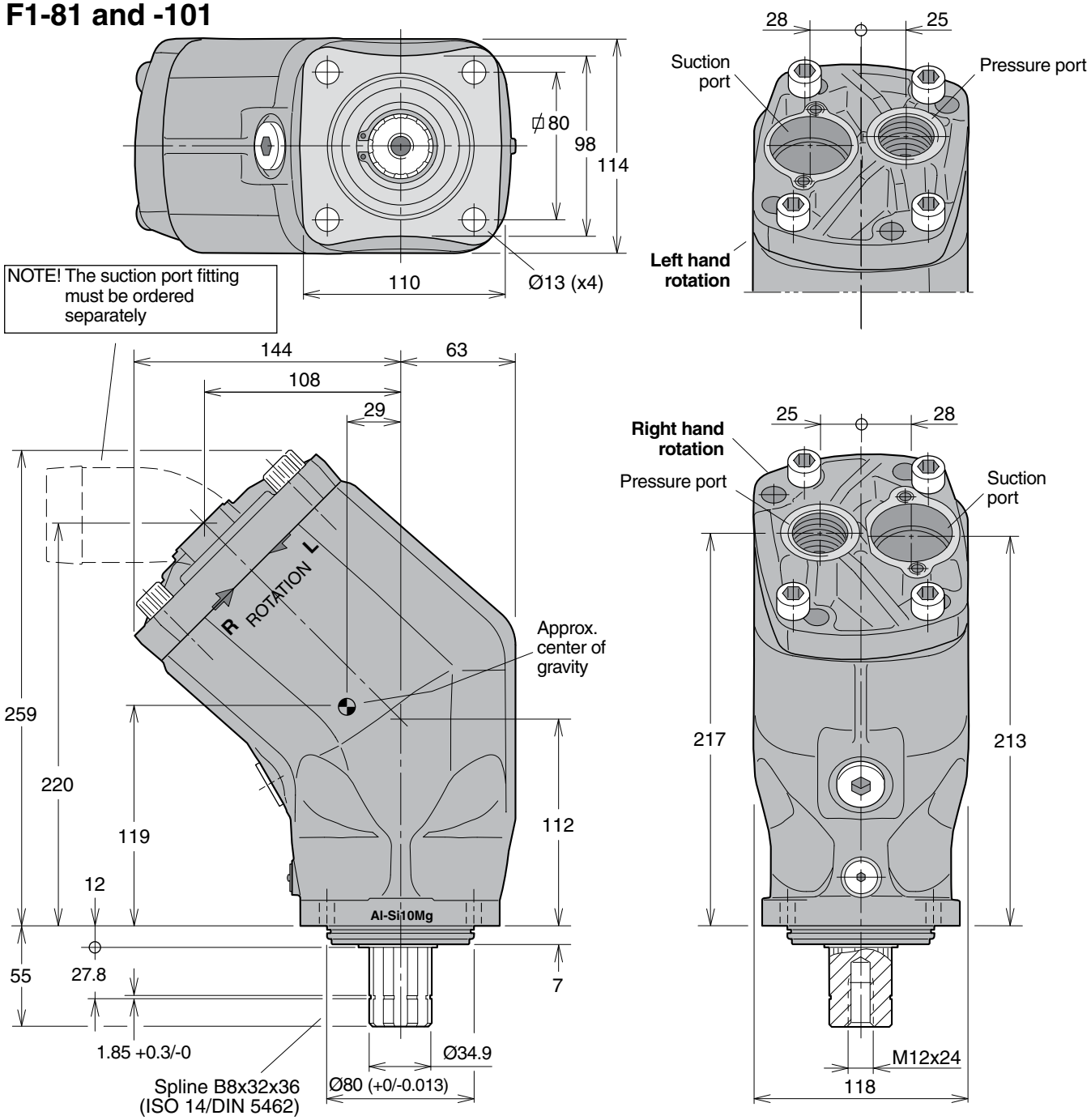
Shaft rotation
R Right hand
L Left hand

NOTE: The pump **does not** include a suction fitting; it must be ordered separately. See chapter 11.

Standard versions

Designation	Ordering no.
F1-25-R	378 1024
F1-25-L	378 1025
F1-41-R	378 1040
F1-41-L	378 1041
F1-51-R	378 1050
F1-51-L	378 1051
F1-61-R	378 1060
F1-61-L	378 1061

F1-81 and -101



Port size

F1 frame size	Pressure port [1)]
-25	3/4"
-41	3/4"
-51	3/4"
-61	3/4"
-81	1"
-101	1"

1) BSP thread (fitting not included)

Standard versions

Designation	Ordering no.
F1-81-R	378 1080
F1-81-L	378 1081
F1-101-R	378 1100
F1-101-L	378 1101

NOTE: The pump **does not** include a suction fitting; it must be ordered separately. See chapter 11.

F1-12 ISO with BSP port treads

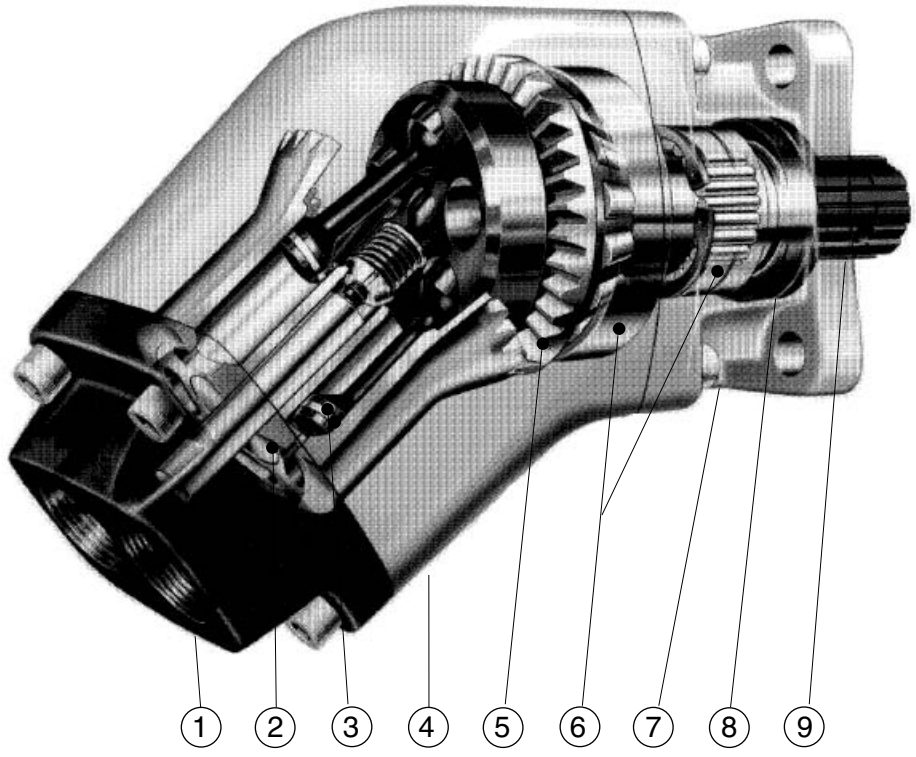
Specifications

Frame size F1-	12
Displacement [cm^3/rev]	12
Max flow 1) [l/min]	28
Max operating pressure [bar]	350
Shaft speed [rpm]	
- short circuited pump (low press.)	3100
- max selfpriming speed	2300
Torque 1) [Nm]	67
Max input power [kW]	16
Weight [kg]	6.7

1) Theoretical values

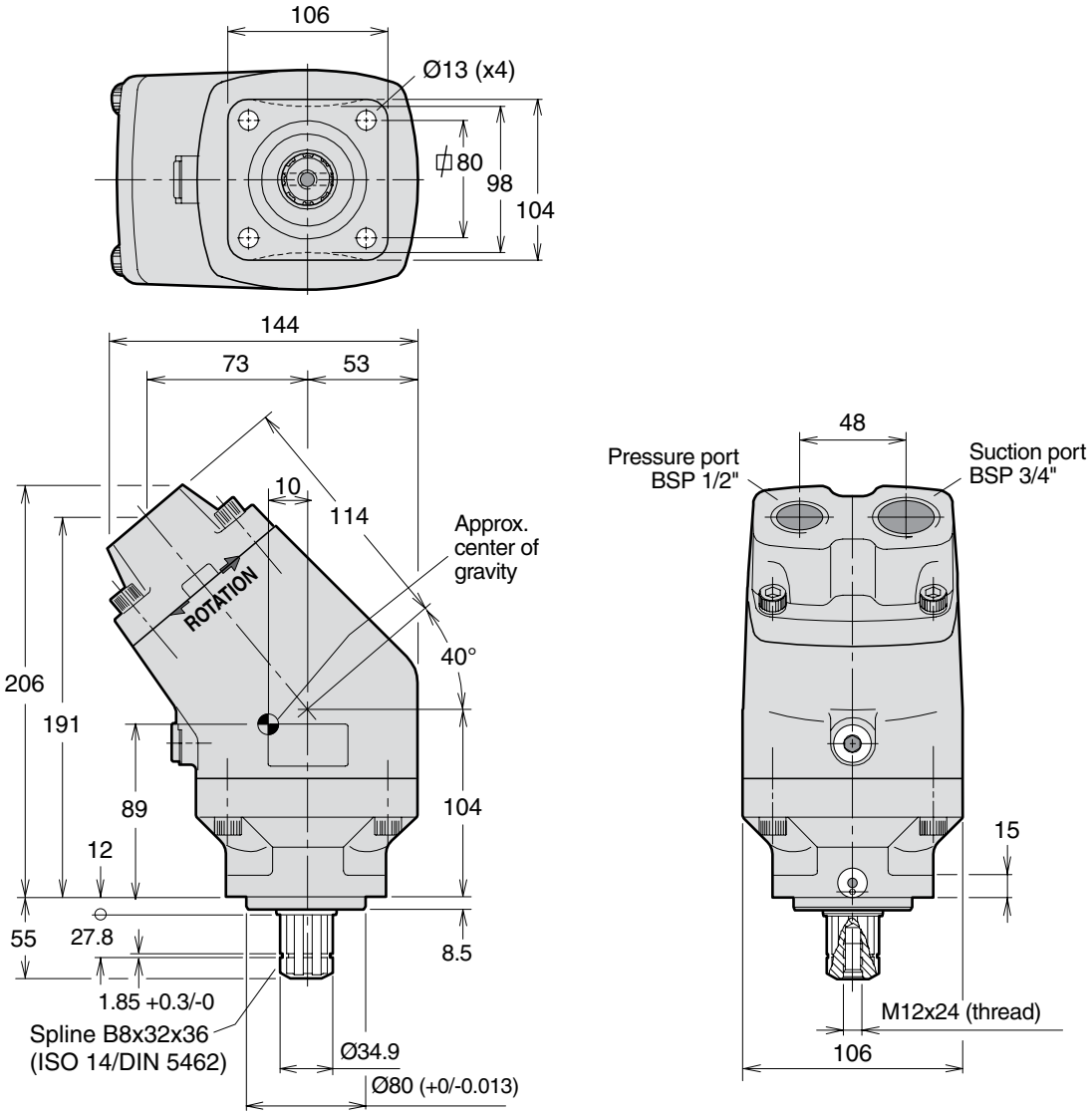
NOTE: For noise level information, contact Parker Hannifin

Pump cross section



1 End cap
2 Cylinder barrel
3 Piston with piston ring
4 Barrel housing
5 Timing gear
6 Roller bearings
7 Bearing housing with flange
8 Shaft seals
9 Input shaft

F1-12 with BSP port treads



Ordering code

Example: **F1- 12 - R**

F1 frame size **12**

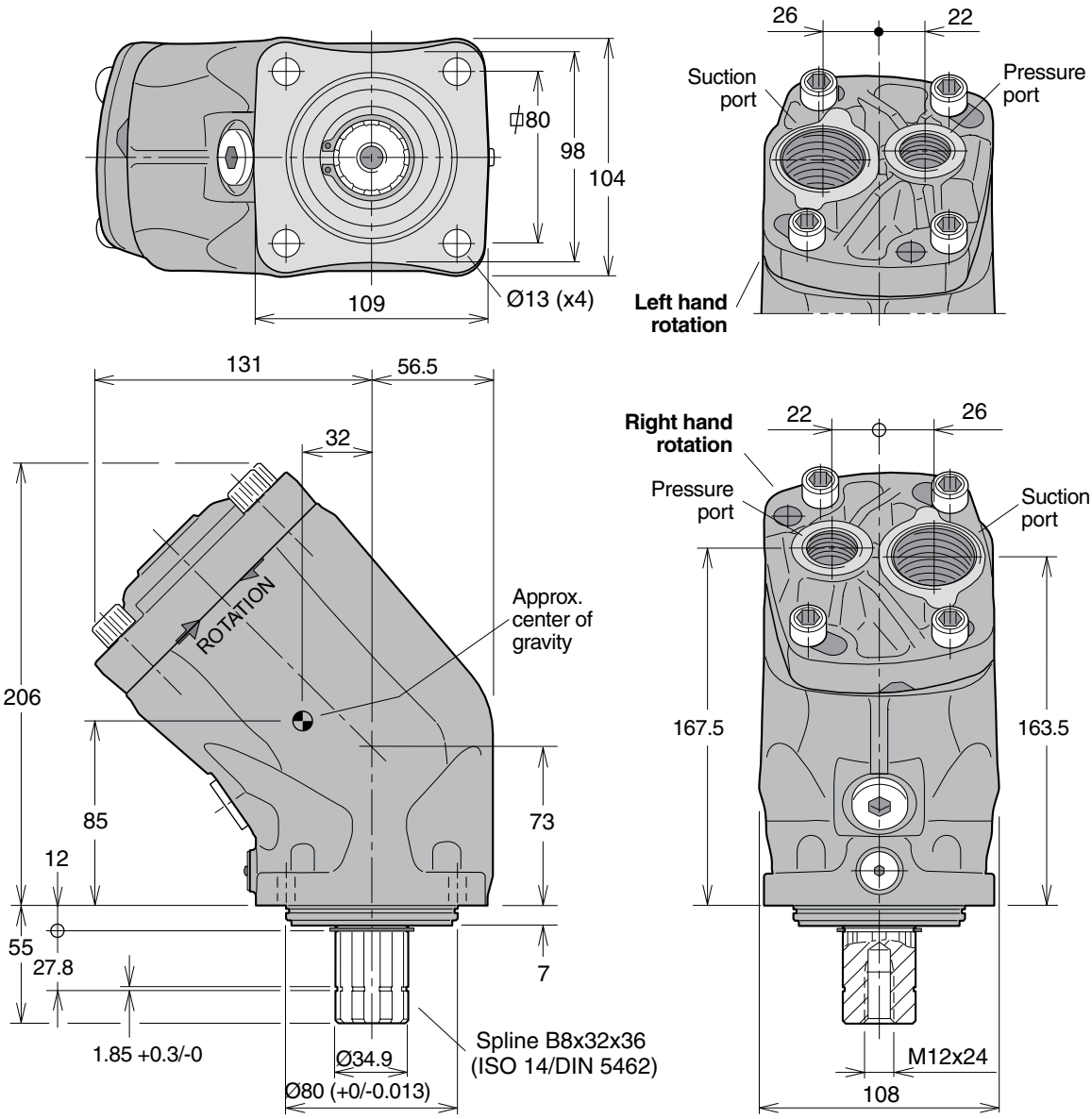
Shaft rotation
R Right hand
L Left hand

NOTE: The pump **does not** include a suction fitting; it must be ordered separately. See chapter 11.

Standard versions

Designation	Ordering no.
F1-12-R	378 2212
F1-12-L	378 2211

F1-25, -41, -51 and -61 with BSP port treads



Port size (all ports are BSP)

F1 frame size	Pressure port [1)]	Suction port
-25	3/4"	1"
-41	3/4"	1"
-51	3/4"	1"
-61	3/4"	1"

Ordering code

Example: **F1- 61 - RB**

F1 frame size
25, 41, 51, 61, 81 or 101

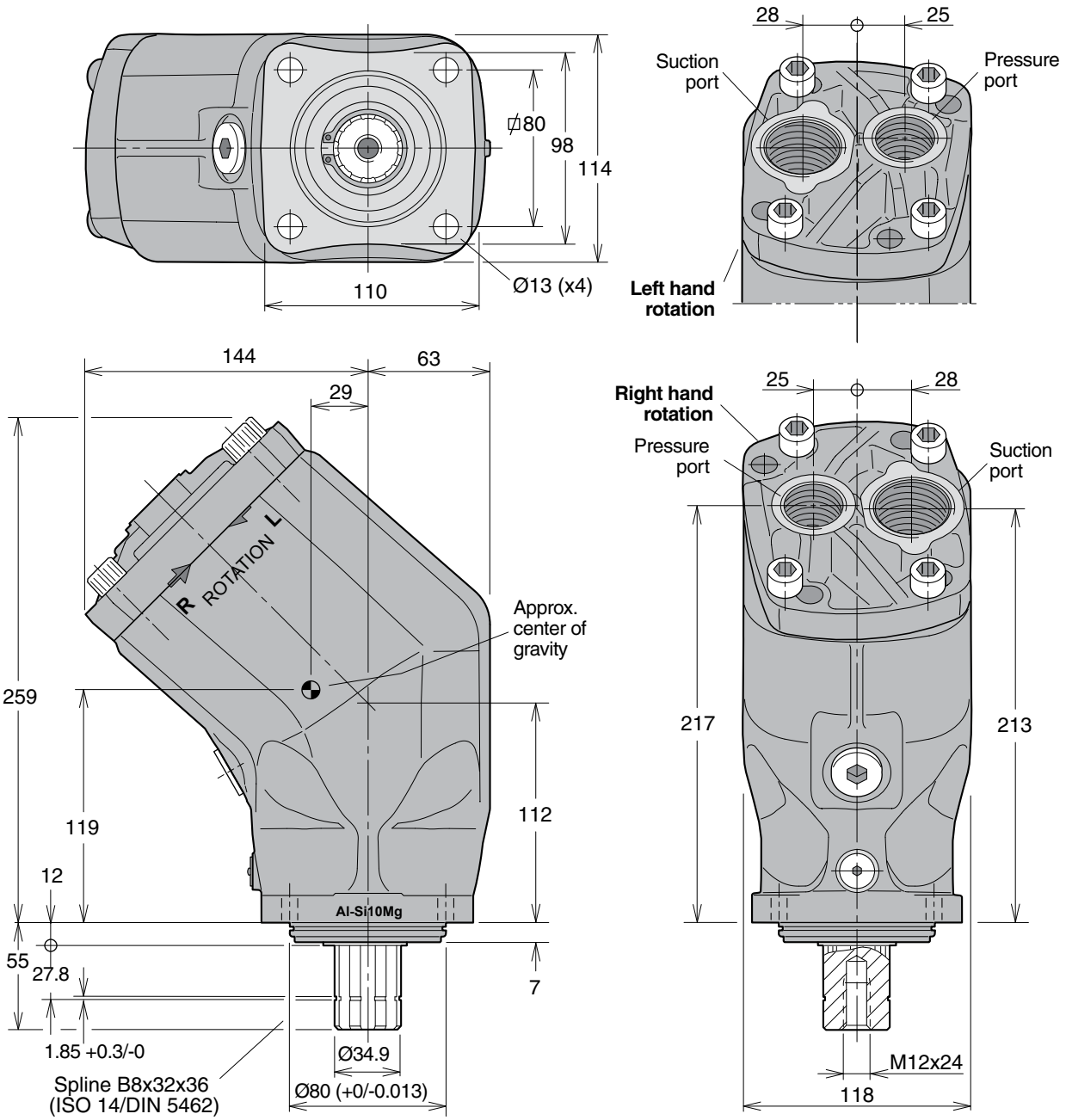
Shaft rotation/port threads
RB Right hand/BSP
LB Left hand/BSP

Standard versions

Designation	Ordering no.
F1-25-RB	378 4024
F1-25-LB	378 4025
F1-41-RB	378 4040
F1-41-LB	378 4041
F1-51-RB	378 4050
F1-51-LB	378 4051
F1-61-RB	378 4060
F1-61-LB	378 4061

NOTE: The pump **does not** include a suction fitting; it must be ordered separately. See chapter 11.

F1-81 and -101 with BSP port treads



Port size (all ports are BSP)

F1 frame size	Pressure port [1)]	Suction port
-81	1"	$1^1/_4$"
-101	1"	$1^1/_4$"

Standard versions

Designation	Ordering no.
F1-81-RB	378 4080
F1-81-LB	378 4081
F1-101-RB	378 4100
F1-101-LB	378 4101

Ordering code

Example: **F1- 81 - RB**

F1 frame size

25, 41, 51, 61, 81 or 101

Shaft rotation/port threads

RB Right hand/BSP

LB Left hand/BSP

NOTE: The pump **does not** include a suction fitting; it must be ordered separately. See chapter 11.

F1 Pump

F1-SAE



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Specifications

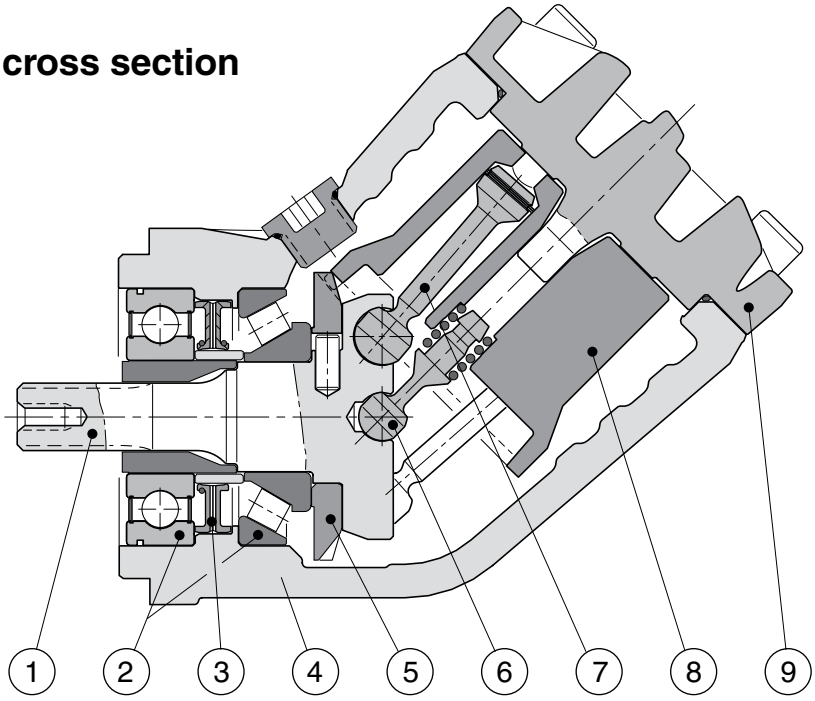
Frame size F1-	**25**	**41**	**51**	**61**
Displacement [cm³/rev]	25.6	40.9	51.1	59.5
[cu in/rev]	*1.56*	*2.50*	*3.12*	*3.63*
Max flow 1) [l/min]	78	104	125	143
[gpm]	*20.6*	*27.5*	*33.0*	*37.8*
Max operating pressure [bar]	350	350	350	350
[psi]	5800	5800	5800	5800
Shaft speed [rpm]				
- short circuited pump (low press.)	3100	2700	2700	2700
- max selfpriming speed 2)	3050	2550	2450	2400
Torque 1)				
at 350 bar [Nm]	142	227	284	331
at 5000 psi *[lbf ft]*	*105*	*168*	*210*	*244*
Max input power				
[kW]	45	61	73	83
[hp]	*60*	*82*	*98*	*111*
Weight [kg]	8.5	8.5	8.5	8.5
[lbs]	*18.7*	*18.7*	*18.7*	*18.7*

1) Theoretical values

2) Valid at an inlet pressure of 1.0 bar/*15 psi* (abs.) when operating on mineral oil at a viscosity of 30 mm²/s (cSt)/150 SUS.

NOTE: For noise level information, contact Parker Hannifin.

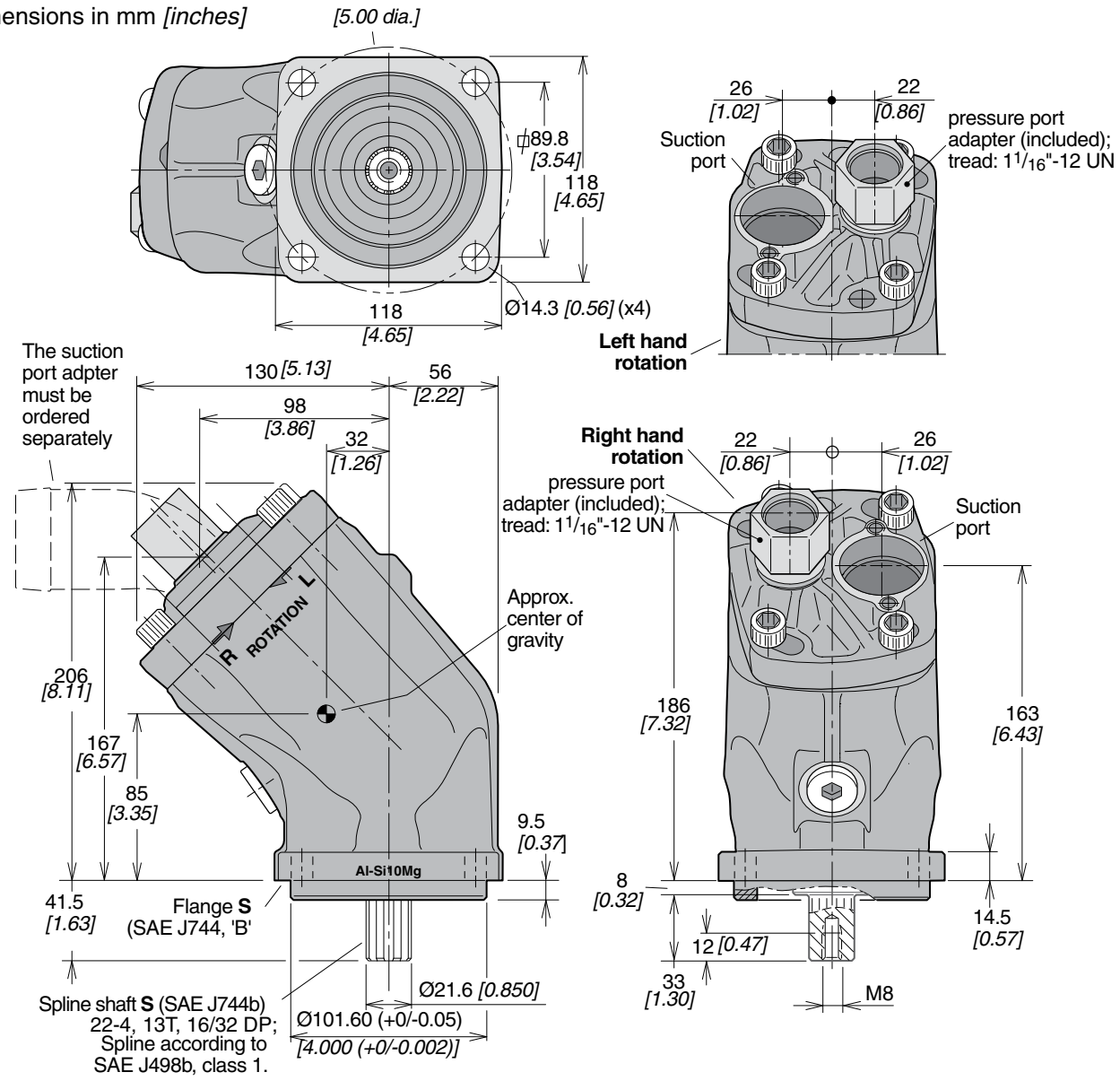
Pump cross section



1. Input shaft
2. Bearings
3. Shaft seal
4. Housing
5. Timing gear
6. Barrel support
7. Piston with piston ring
8. Cylinder barrel
9. End cap

Installation dimensions, F1-25, -41, -51 and -61 (SAE)

Dimensions in mm *[inches]*



Ordering code (SAE)

Example: **F1- 61 - R U - S V - S**

F1 frame size
25, 41, 51 or 61

Shaft rotation
R Right hand
L Left hand

Main port
U SAE O-ring, UN threads

Mounting flange
S SAE "B"

Shaft seal
V FPM

Shaft end
S SAE spline "B" spline

Port size

F1 frame size	Pressure port [1)]
-25	1 1/16"-12 UN
-41	1 1/16"-12 UN
-51	1 1/16"-12 UN
-61	1 1/16"-12 UN

1) BSP-to-SAE adapter (included)

Standard SAE versions

Designation	Ordering no.
F1-25-RU	378 1424
F1-25-LU	378 1425
F1-41-RU	378 1440
F1-41-LU	378 1441
F1-51-RU	378 1450
F1-51-LU	378 1451
F1-61-RU	378 1460
F1-61-LU	378 1461

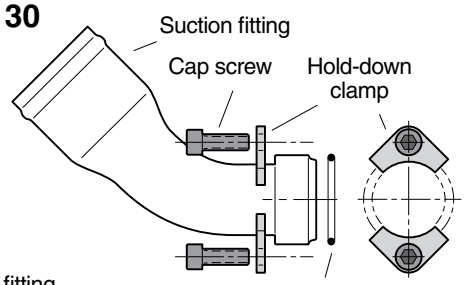
NOTE: The pump **does not** include a suction fitting; it must be ordered separately. See chapter 11.

Parker Hannifin
Pump & Motor Division Europe
Trollhättan, Sweden

Suction fittings

for series F1, F2 and T1 pumps also VP1-095, -110 and -130

A 'suction fitting' consists of a straight, 45°, 90° or 135° suction fitting, clamps, cap screws and O-ring.

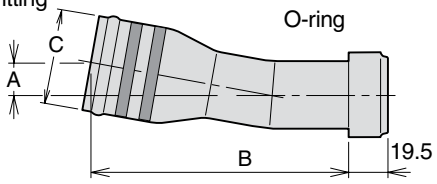


NOTE: A suction fitting *must be ordered separately* (not included with the pump).
To choice the correct dimension of suction connection, see chapter 2.

Suctions fittings for VP1-045/060/075 see page 57.

'Straight' suction fittings for F1, T1, F2, F3, VP1-095/-110/-130

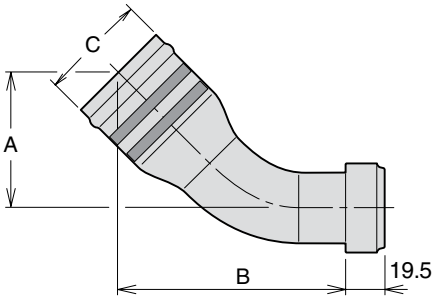
'Straight' fitting



Ordering no.	A mm	B mm	C dia. mm *(in.)*
378 0635[1)]	0	85	38 *(1 1/2")*
378 0636[2)]	17	136	50 *(2")*
378 0637[3)]	25	145	63 *(2 1/2")*
378 3523[3)]	32	174	75 *(3")*

45° suction fittings for F1, T1, F2, F3, VP1-095/-110/-130

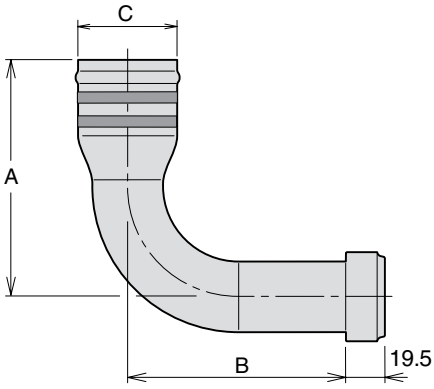
45° fitting



Ordering no.	A mm	B mm	C dia. mm *(in.)*
378 1234[1)]	60	104	32 *(1 1/4")*
378 0633[1)]	60	104	38 *(1 1/2")*
378 0364[2)]	67	110	50 *(2")*
378 0634[3)]	75	117	63 *(2 1/2")*
378 3367[3)]	95	138	75 *(3")*
378 1062	67	110	40
378 0975	67	110	45

90° suction fittings for F1, T1, F2, F3, VP1-095/-110/-130

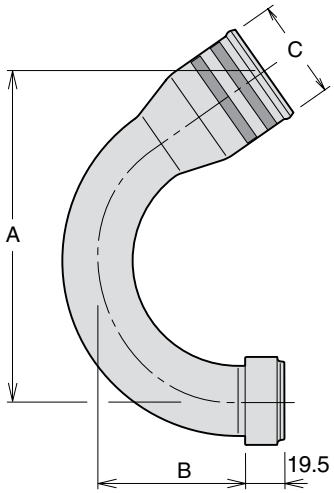
90° fitting



Ordering no.	A mm	B mm	C dia. mm *(in.)*
378 0978[1)]	126	83	38 *(1 1/2")*
378 0979[2)]	135	83	50 *(2")*
378 1980[3)]	147	83	63 *(2 1/2")*
378 0976	135	83	45
378 8690[3)]	185	83	75 *(3")*

145° suction fitting for F1, T1, F2, F3, VP1-095/-110/-130

145° fitting



Ordering no.	A mm	B mm	C dia. mm *(in.)*
378 1867	165	73	50 *(2")*

1) Recommended for frame size F1-25.
2) Recommended for frame size F1-41,-51,-61,-81, -101.
3) (3 clamps and 3 screws)

Spare parts

Additional Hold-down-clamp kit consists of:
hold-down-clamp cap screw and O-ring
Ordering no. 378 1321

Additional Hold-down-clamp kit for mounting on BPV
Ordering no. 378 2439

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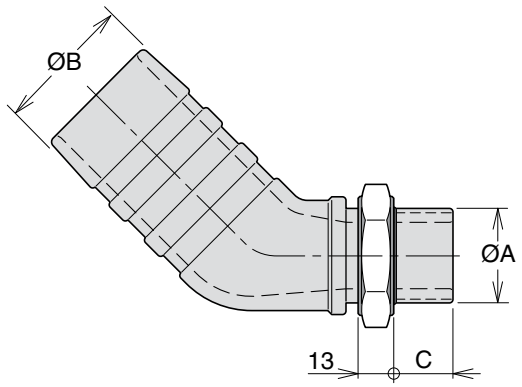
Suitable suction fittings for F1 and VP1-045/-060/-075 with BSP port treads

NOTE: A suction fitting *must be ordered separately* (not included with the pump).
To choice the correct dimension of suction connection, see chapter 2.

45° suction fittings

Ordering no.	ØA	ØB inch	C mm
00509035016	BSP 1" [1)]	2"	18
00509035116	BSP 11/4"	2"	18
00509021916	BSP 11/4"	21/2"	18

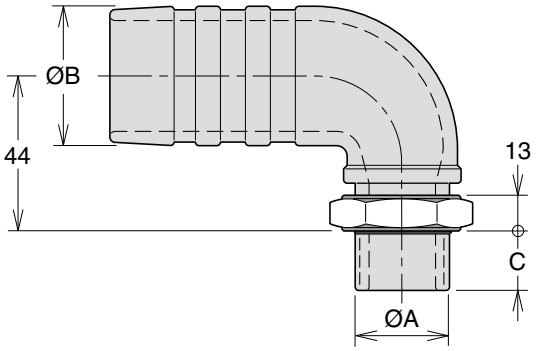
1) Not for VP1-045/-060/-075



90° suction fittings

Ordering no.	ØA	ØB inch	C mm
00509034516	BSP 1" [1)]	2"	18
00509034616	BSP 11/4"	2"	18

1) Not for VP1-045/-060/-075

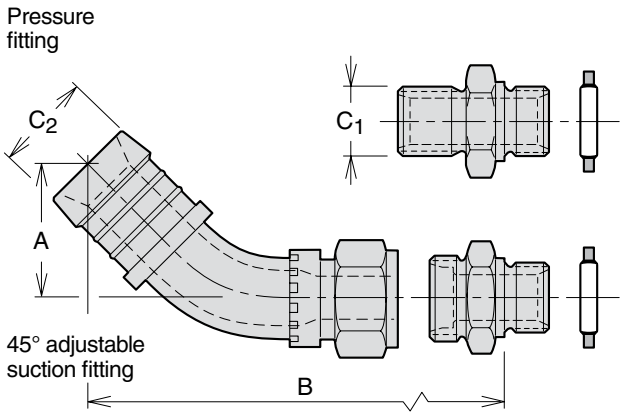


Fitting kits for VP1-045/-060/-075 pumps

Kits with 45° suction fitting

Order no.	C_1	ØC_2 inch	A mm	B mm
379 9563	BSP 3/4"	2"	71	154
379 9562	BSP 1" *	2 1/2"	64	147

* Above 100 l/min



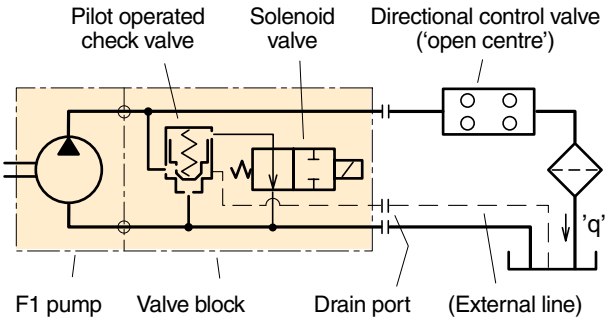
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Trollhättan, Sweden

BPV-F1 and BPV-T1 bypass valve

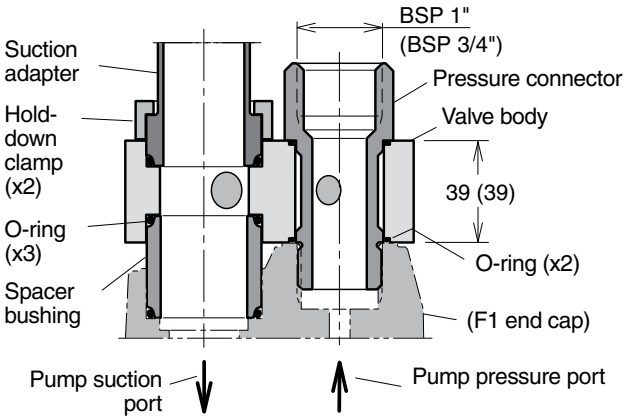
- The bypass valve is mainly utilised in applications where the F1 pump is driven from the crank-shaft through a cardan shaft, or when it is installed on an engine PTO.
- The BPV bypass valve should be disengaged during transportation when the pump is operating constantly and the engine is running at max rpm; the hydraulic system is not sized for the large flow that would otherwise go through it.
- The BPV valve substantially reduces the energy loss during transportation.
- The valve installs directly on top of the pump end cap with a pressure port 'banjo' fitting and an inlet port spacer bushing with two cap screws; refer to the illustration to the right.
- As the BPV valve is symmetrical, it can be 'turned 180°' to prevent interference with chassis components; it can be utilised for either left hand or right hand pumps.
- The valve function must only be activated or released (by means of the 24 VDC solenoid) at *no-load* (below 20 bar) *system pressure*.

IMPORTANT INFORMATION

- In order to secure a cooling flow through the system, a separate drain line **must** be connected from the BPV-F1 drain line fitting directly to tank; (shown in the Installation Information Bulletin MSG30-8227-INST/UK/DE) refer also to the schematic.
- The pressure connector must be tightened (to 50 Nm) before the suction fitting clamp screws are tightened.



Bypass valve schematic.



12

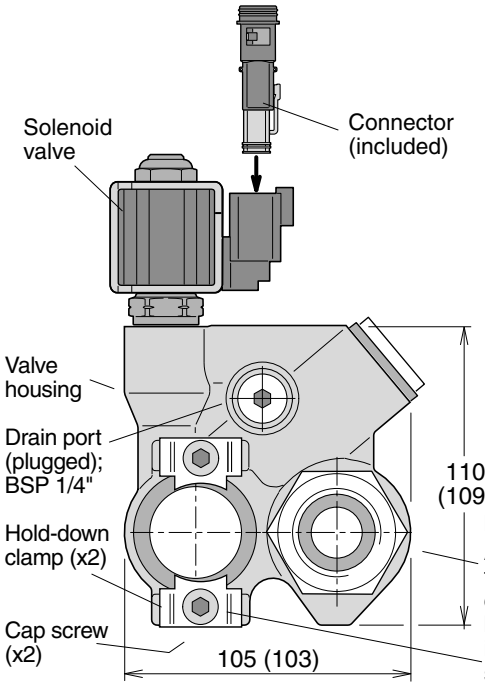
Parker Hannifin
Pump & Motor Division Europe
Trollhättan, Sweden

BPV-F1 and BPV-T1 Bypass valve
Without manual override

Bypass valve, type	**BPV-F1-25 to -101 and BPV-T1-81 and -121**
Max pressure, continuous	350 bar
intermittent	400 bar
Solenoid voltage *(option)*	24 VDC, *(12 VDC)*
Power requirement	14 W
Operating mode	Activated solenoid: Check valve closed

Bypass valve	Voltage	Ordering number	For F1 and T1 size	Torque[1]
BPV-F1, BPV-T1	24 VDC 12 VDC	**378 7201** **378 7202**	**F1**-25[2], -41, -51, -61 and **T1**-81	50 Nm
	24 VDC 12 VDC	**378 7203** **378 7204**	**F1**-81, -101 and **T1**-121	100 Nm
Drain fitting kit[2] F1-025		**378 1640**	Contains a drain line fitting a bonded seal and nozzle.	
Drain fitting kit other F1, T1 and F2		**378 3039**	Contains a drain line fitting and a bonded seal. **N.B.** Included in the complete bypass valve.	

1) Torque pressure connector to:
2) Drain fitting kit **378 1640** must be ordered separately for **F1-025**.



IMPORTANT: Always tighten the pressure connector before tightening the cap screws.
Also, see table to the left.

NOTE: Dimensions are shown for BPV-F1-81 (those for BPV-F1-25 are in parenthesis)

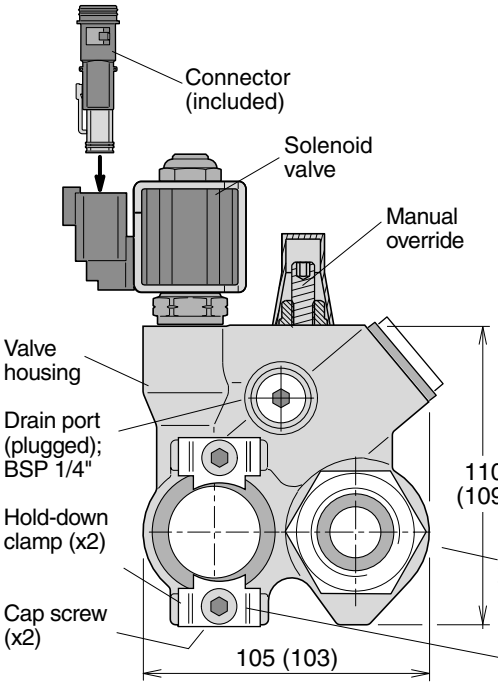
BPV-F1 and -T1 installation and cross section without manual override

BPV-F1 and BPV-T1 Bypass valve
With manual override

Bypass valve, type	**BPV-F1-25 to -101 and BPV-T1-81 and -121**
Max pressure, continuous	350 bar
intermittent	400 bar
Solenoid voltage	24 VDC
Power requirement	14 W
Operating mode	Activated solenoid: Check valve closed

Bypass valve	Voltage	Ordering number	For F1 and T1 size	Torque[1]
BPV-F1, BPV-T1	24 VDC	**378 4179**	**F1**-25[2], -41, -51, -61 and **T1**-81	50 Nm
	24 VDC	**378 4180**	**F1**-81, -101 and **T1**-121	100 Nm
Drain fitting kit[2] F1-025		**378 1640**	Contains a drain line fitting a bonded seal and nozzle.	
Drain fitting kit other F1, T1 and F2		**378 3039**	Contains a drain line fitting and a bonded seal. **N.B.** Included in the complete bypass valve.	

1) Torque pressure connector to:
2) Drain fitting kit **378 1640** must be ordered separately for **F1-025**.



IMPORTANT: Always tighten the pressure connector before tightening the cap screws.
Also, see table to the left.

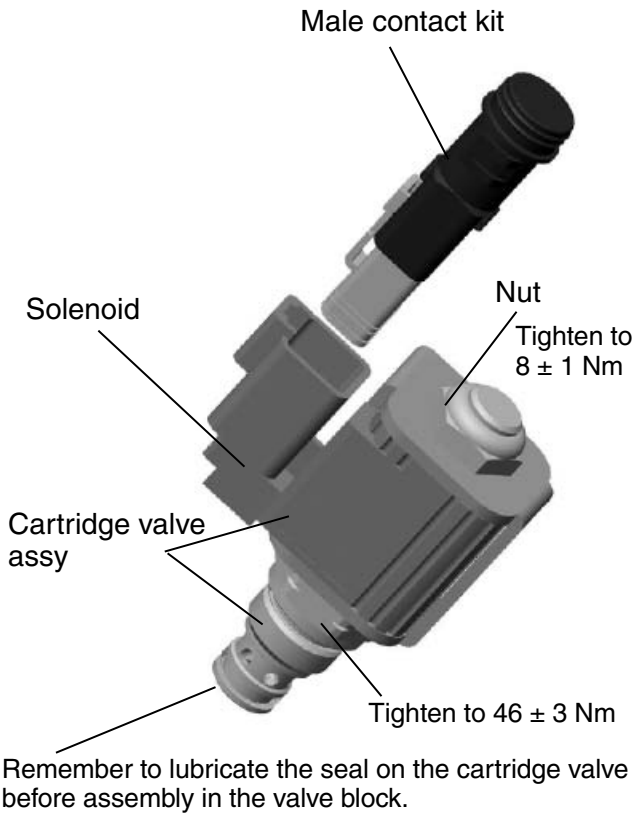
NOTE: Dimensions are shown for BPV-F1-81 (those for BPV-F1-25 are in parenthesis)

BPV-F1 installation and cross section with manual override

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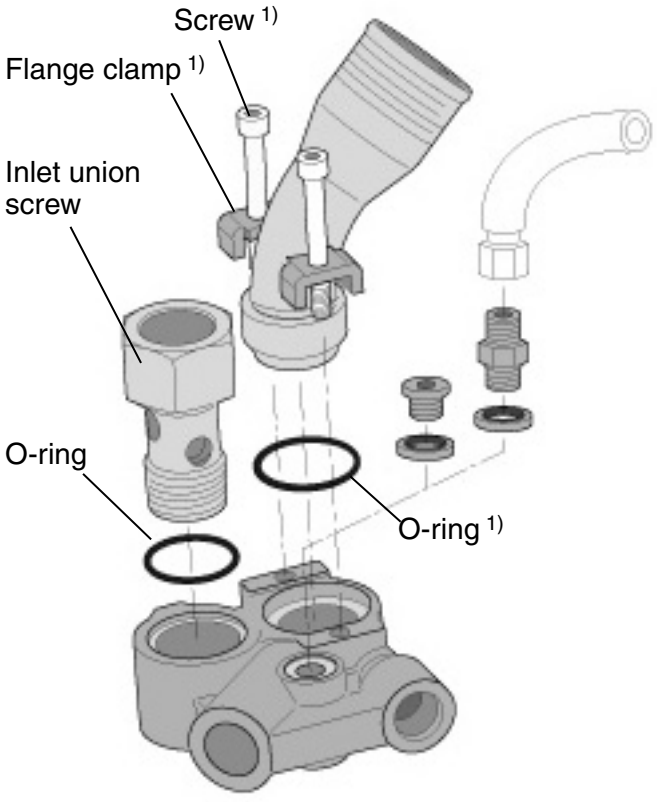
BPV-F1, -T1, -F2 and -F3 Accessories / Spare Parts

Part No	Description	Remarks
3787496	Solenoid 24V	Incl. new connector
3787497	Solenoid 12V	Incl. new connector
3787494	Cartridge valve assy 24V	Incl. new connector
3787495	Cartridge valve assy 12V	Incl. new connector
3785948	Nut for cartridge valve	
3787488	Male contact kit	



Part No	Description	Remarks
3781480	Inlet union screw	F2 (all sizes)
3781082	Inlet union screw	F1-25, -41, -51, -61 and T1-81
3781094	Inlet union screw	F1-81, -101, T1-121, and F3-81, -101
3780641	O-ring kit	For F1, T1, F2 and F3 (all sizes)
3782439	Hold-down clamp Suction fitting [1)]	For BPV F1, T1, F2 and F3

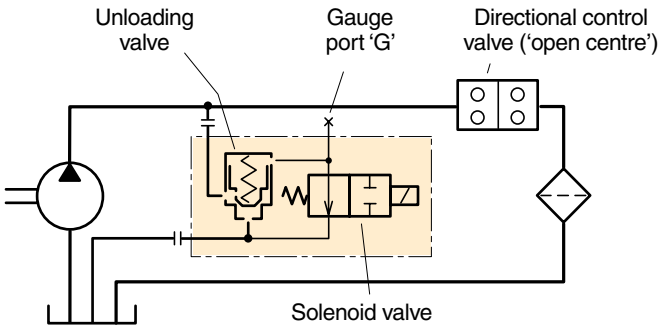
1) Hold-down clamp for suction fitting on bypass valve for F1, T1, F2 and F3 (parts designated '1' in the split view).



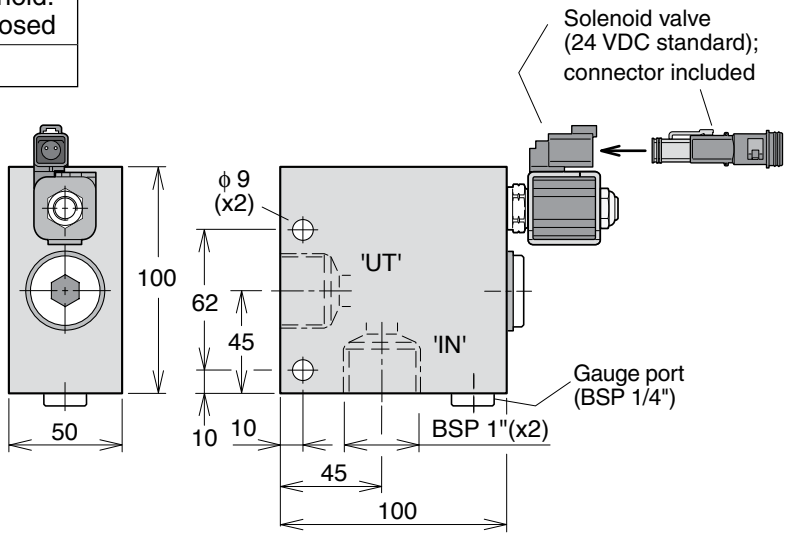
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BPV-L line mounted bypass valve

- The unloading valve BPV-L is utilised in hydraulic systems where the fixed displacement pump is engaged constantly and no flow is required, i.e. during transportation. The flow is directed through the unloading valve which has a low pressure loss and less heat is being generated in the system.
- When the solenoid is activated the unloading valve closes and the pump flow is directed to the directional control valve or other user.



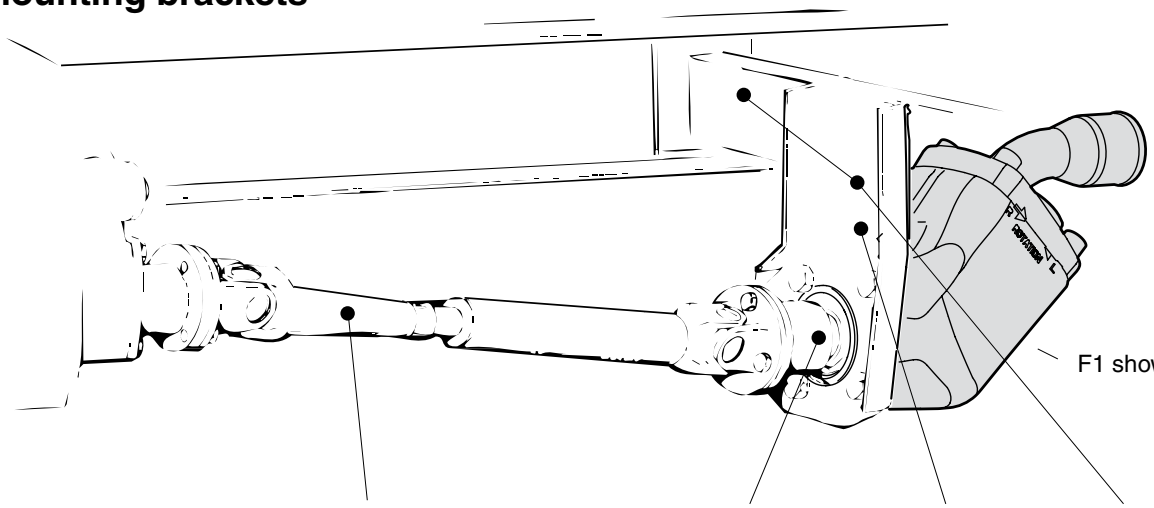
Unloading valve, type	BPV-L
Max operating pressure [bar]	350
Max flow [l/min]	250
Solenoid voltage [VDC]	24
Required power [W]	14
Operating mode	Activated solenoid: Check valve closed
Ordering number	**378 1487**



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Cardan shafts, pump couplings and mounting brackets



Pump or splitter box type	Cardan shaft kit		Pump coupling		Bracket	Bracket kit
	Type	Ordering no.	Type	Ordering no.	ordering no.	ordering no.
F1 [1)]	SAE 88[1)]	**73 001**	SAE 88[1)]	**370 4628**	**379 7831**	**379 7832**
F1 (New)	SAE 88[1)]	**73 001**	SAE 88[1)]	**378 0644**	**379 7831**	**379 7832**
F1 (New)	SAE 97	**370 0315**	SAE 97	**378 0645**	**379 7831**	**379 7832**
F1	SAE 97	**370 0315**	SAE 97	**370 4631**	**379 7831**	**379 7832**
F2	SAE 97	**370 0315**	SAE 97	**370 4631**	**379 7831**	**379 7832**
T1-51	SAE 97	**370 0315**	SAE 97	**370 4631**	**379 7831**	**379 7832**
VP1	SAE 97	**370 0315**	SAE 97	**370 4631**	**379 7831**	**379 7832**
SB154, SB118	SAE 97	**370 0315**	SAE 97/ DIN 90	Included with splitter box		**370 5220**

1) The SAE 88 cardan shaft and pump coupling can also be used to drive a series F2, T1-51 or VP1 pump providing max allowed shaft torque (below) is not exceeded.

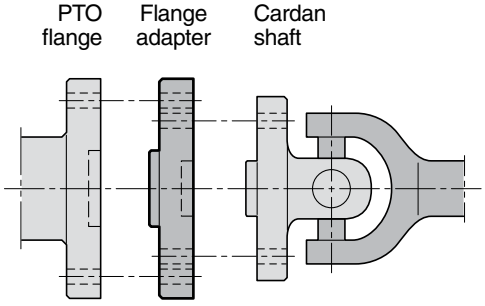
Cardan shaft specifications

Cardan shaft type	Spicer designation	Max length [mm]	Diameter [mm]	Max torque peak/contin. [Nm]	Ordering number
SAE 88	K1140	1500	45	600/300	**73 001**
SAE 97	K1310	1500	50	1000/500	**370 0315**

PTO flange adapters

Cardan shaft type	PTO flange type	Flange adapter ordering no.
DIN 100	DIN 90	**370 5899**[3)]

3) **WARNING!** The utilised cardan shaft torque limits (above) must not be exceeded.



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Pump couplings

Designation	**DIN 90** (fig. 1)
A	90
B	74.5
C	47 h7
D	M8
E_1	61.5
E_2 (F1)	57.2
VP1, F2, F1*	**370 4634**
F1	**378 0642**

NOTE: Max torque is limited by the cardan shaft.

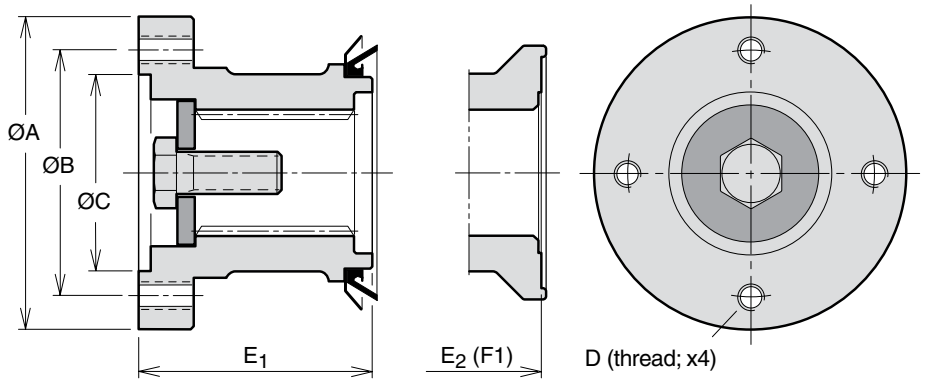


Fig. 1. DIN 90 (370 4634) *(378 0642)*

Designation	**DIN 90** (fig. 2)
A	90
B	74.5
C	47 h7
D	8.2
E_1	61.5
VP1, F2, F1*	**370 7423**

NOTE: Max torque is limited by the cardan shaft.

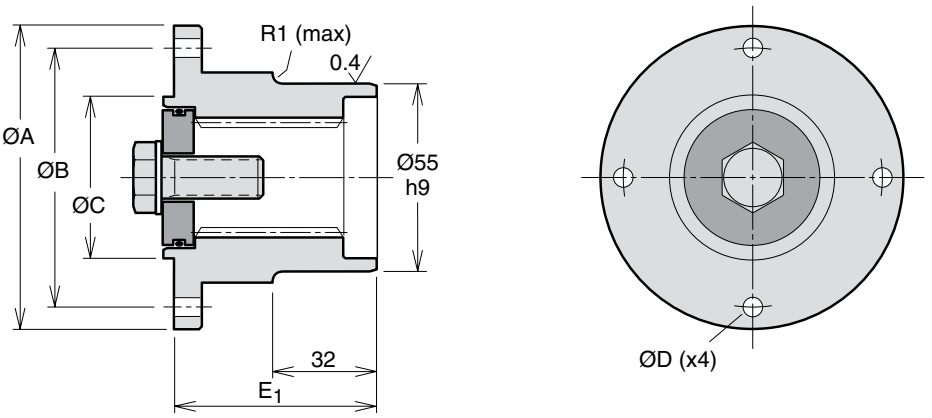


Fig. 2. DIN 90 (370 7423)

Designation	**SAE88** (fig. 3)
A	88
B	69.9
C	57.15 H8
D	$^5/_{16}$" UNC
E_1	59.5
Max torque [Nm] interm./contin.	600/300
F1	**378 0644**

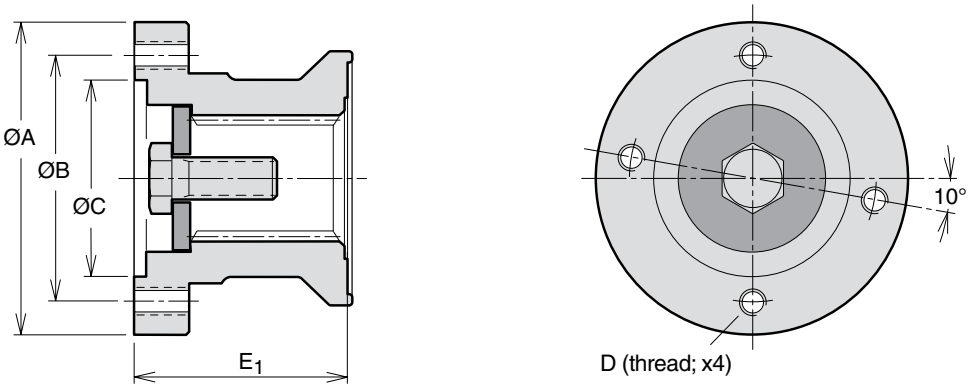


Fig. 3. SAE 88 (378 0644)

Designation	**SAE97** (fig. 4)
A	97
B	79.4
C	60.33 H8
D	$^3/_8$" UNC
E_1	65
E_2 (F1)	59.5
Max torque [Nm] interm./contin.	1000/500
VP1, F2, F1*	**370 4631**
F1	**378 0645**

F1* Old versions

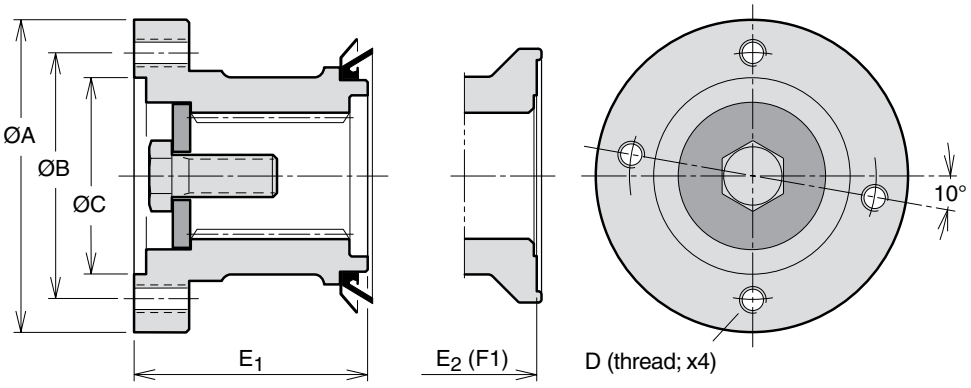


Fig. 4. SAE97 (370 4631) *(378 0645)*

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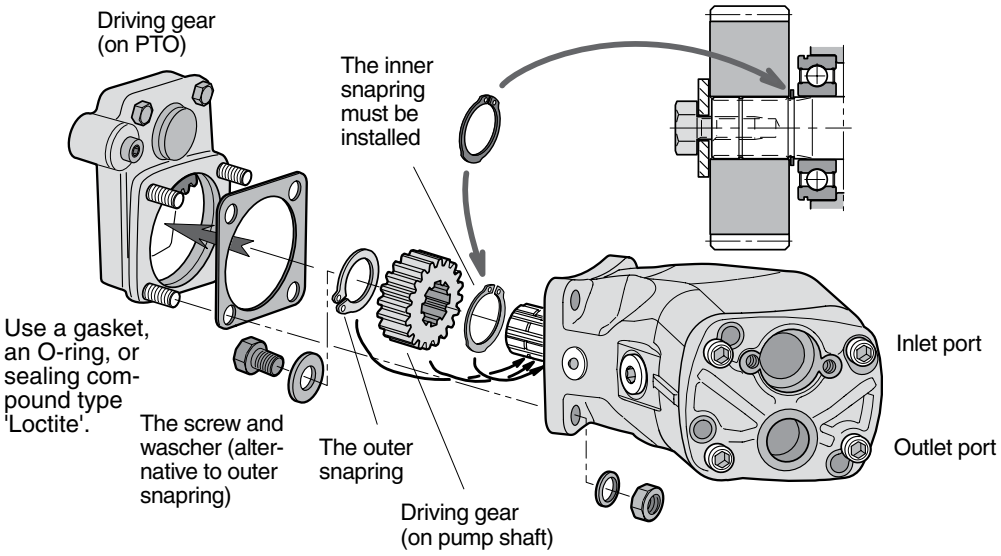
Installation and start up

Installing couplings, sleeves, and gears on the pump shaft.

This is a short installation and start up information.
To have the complete and latest installation information, always see the installation info supplied together with the pump.

PTO installation

- 'Left hand' and 'Right hand' rotation defined in the illustrations on page 75.
- The driving gear of the PTO and the driven gear of the pump are shown in the illustration below. (A right hand rotating pump is shown).



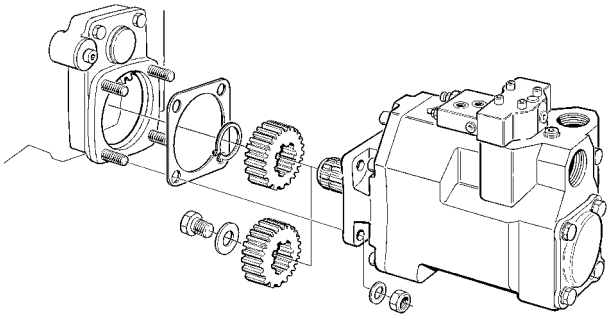


Fig. 6. VP1-to-PTO installation.

IMPORTANT

Use some kind of special tool when you install couplings, sleeves, and gears on the pump shaft. Force must never be used when installing these parts on the F1 shaft.

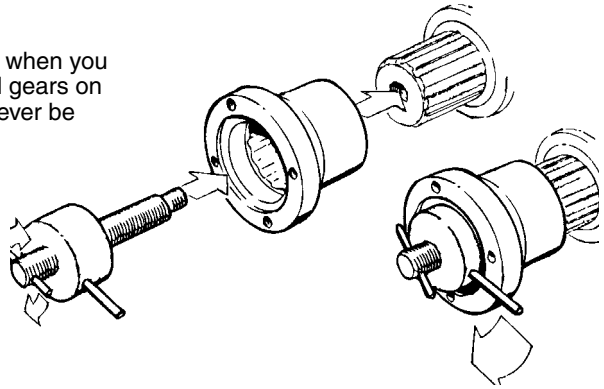
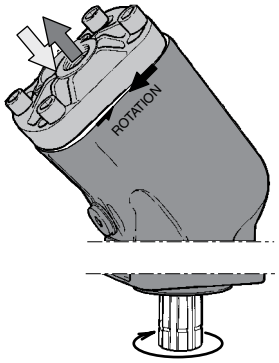
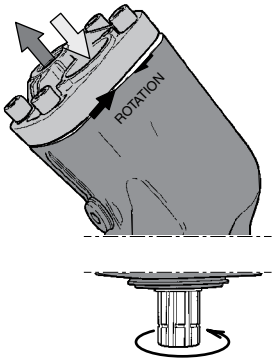


Fig. 7 Mounting tool.

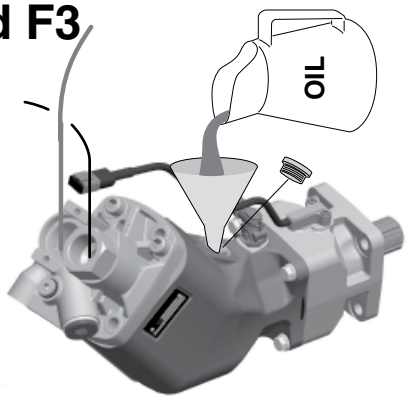
Installation and start-up for F1, T1, F2 and F3



Left hand (L.H.; counter clockwise) rotating pump.



Right hand (R.H.; clockwise) rotating pump.



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

Direction of rotation

The pictures above show direction of flow vs. shaft rotation.

The direction of rotation can be changed (i. e. from right hand to left hand) by turning the end cap.

Remove the four cap screws and turn the end cap about half a turn while making sure it stays in contact with the barrel housing.

Re-fit the cap screws and torque to 80-100 Nm.

Installation

Make sure max torque and bending moment (due to the weight of the pump) of the utilised PTO are not exceeded. (The approx. center of gravity of the various pump sizes are shown in the installation drawings).

The top illustration on page 73 shows two ways of installing a gear on the shaft of fixed displacement pumps. The pump shaft spline end usually fits directly in the PTO internal spline coupling.

NOTE: In order to obtain the longest bearing life, the pump should be installed according to the information shown on page 76 "Pump bearing life".

Fluid viscosity

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

Operating viscosity limits:
- Min 10 mm^2/s; max 400 mm^2/s.
- At start-up, max 4000 mm^2/s.

Fluids

The fixed displacement pumps data shown in the specifications for each pump in chapter 3 to 9 are valid when operating on high quality, mineral based hydraulic oil.

Type HLP (according to DIN 51524) hydraulic oil is suitable as well as biologically degradeable fluids like natural and synthetic esters and polyalfaolefins.

The utilised hydraulic fluid shall meet one of the following Swedish standards:

- SS 15 54 34
- SMR Hydraulic Oil Standard 1996-2.

Contact Parker Hannifin for further information.

NOTE: - ATF (automatic transmission fluid) and API type CD engine oils may also be useable.
- Seals are made of nitrile rubber; make sure the utilised fluid is compatible with this material.

Fluid temperature

Main circuit: Max 75 °C.

Drain line

Fixed displacement pumps don't need an external drain line as they are internally drained.
When the pump is mounted in a Engine-PTO we recommend a drain line from the bypass valve directly to oil tank.

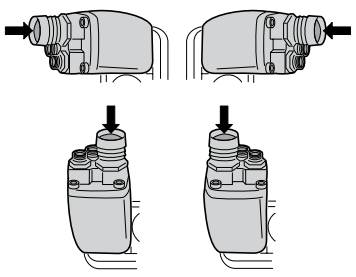
Filtration

Filtration should follow ISO standard 4406, code 20/18/13.
To obtain the longest life of fixed displacement pumps, we recommend an oil cleanliness of 10 µm (absolute).

Start-up

Make sure the entire hydraulic system is clean before filling it with a recommended hydraulic fluid.
In particular, make sure the pump is filled (to at least 50%) as the internal leakage does not provide sufficient lubrication at start-up.

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



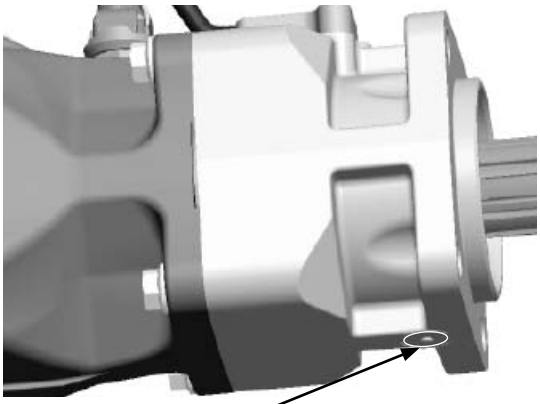
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If any oil should drop out of the indication-hole on the pump;

- 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.

F3



F1



Pump bearing life

Bearing life is dependent on how the pump is installed on the PTO as shown in the illustrations below.

A pump mounted according to fig. 1 gives the lowest bearing life; the highest is obtained when installed according to fig. 3.

Parker Hannifin will assist in determining bearing life in a particular application.

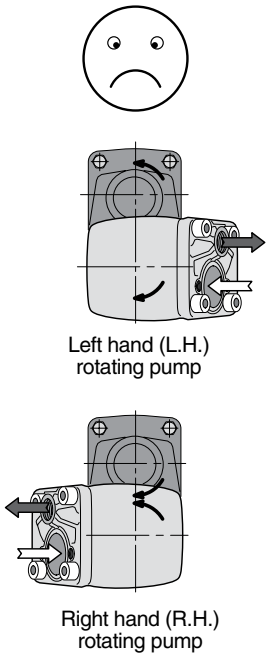


Fig. 1.

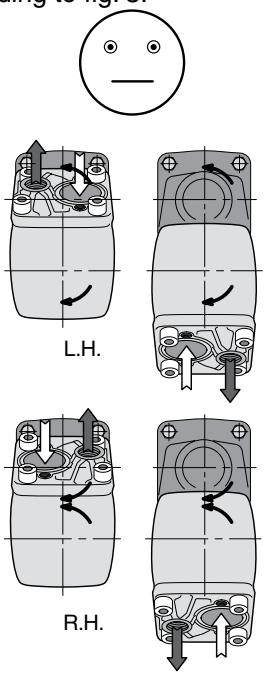


Fig. 2.

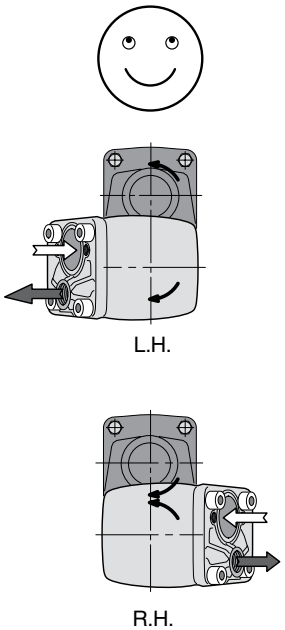


Fig. 3.

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