

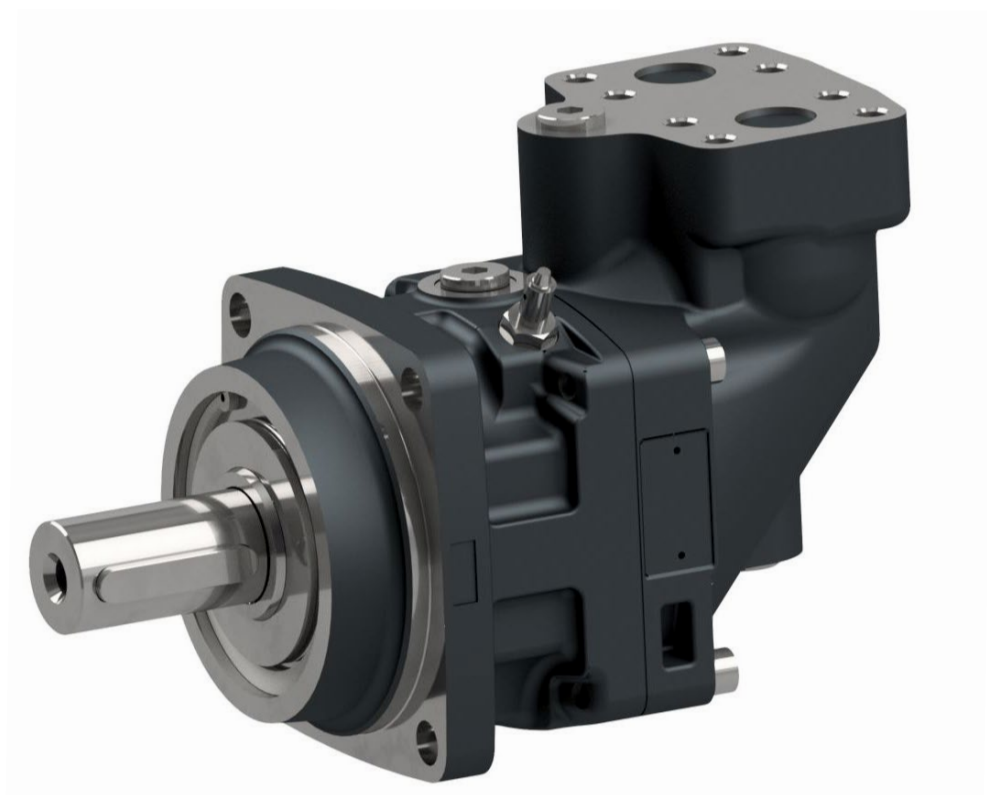


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Bulletin MSG30-5513-M1/UK

Service/Spare Parts Series F12

Effective: March, 2023
Supersedes: October, 2021



ENGINEERING YOUR SUCCESS.

Basic formulas for hydraulic motors

Flow (q)	D – displacement [cm ³ /rev]
$q = \frac{D \times n}{1000 \times \eta_v}$ [l/min]	n – shaft speed [rpm]
	η_v – volumetric efficiency
Torque (M)	Δp – differential pressure [bar] (between inlet and outlet)
$M = \frac{D \times \Delta p \times \eta_{hm}}{63}$ [Nm]	η_{hm} – mechanical efficiency
Power (P)	η_t – overall efficiency ($\eta_t = \eta_v \times \eta_{hm}$)
$P = \frac{q \times \Delta p \times \eta_t}{600}$ [kW]	

Basic formulas for hydraulic pumps

Flow (q)	D – displacement [cm ³ /rev]
$q = \frac{D \times n \times \eta_v}{1000}$ [l/min]	n – shaft speed [rpm]
	η_v – volumetric efficiency
Torque (M)	Δp – differential pressure [bar] (between inlet and outlet)
$M = \frac{D \times \Delta p}{63 \times \eta_{hm}}$ [Nm]	η_{hm} – mechanical efficiency
Power (P)	η_t – overall efficiency ($\eta_t = \eta_v \times \eta_{hm}$)
$P = \frac{q \times \Delta p}{600 \times \eta_t}$ [kW]	

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
1 °C	$\frac{5}{9}(\text{°F}-32)$
1 kW	1.34 hp

Conversion factors

1 lb	0.454 kg
1 lbf	4.448 N
1 lbf ft	1.356 Nm
1 psi	0.068948 bar
1 US gallon	3.785 l
1 cu in	16.387 cm ³
1 in	25.4 mm
1 °F	$\frac{9}{5}\text{°C} + 32$
1 hp	0.7457 kW

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General information

F12 is bent axis, fixed displacement heavyduty motor/pump series. They can be used in numerous applications in both open and closed loop circuits.

Series F12 conforms to current ISO and SAE mounting flange and shaft end configurations. Series F12 are available in ISO, Cartridge, SAW and SAE versions.

The F12 series is available in sizes 30, 40, 60, 80, 90, 110, 125, 152, 162, 182 and 250 cc.

Thanks to the unique spherical piston design, F12 motors can be used at unusually high shaft speeds. Operating pressures to 500 bar provides for the high output power capability.

The 40° angle between shaft and cylinder barrel allows for a very compact, lightweight motor/pump.

The laminated piston ring offers important advantages such as low internal

leakage and thermal shock resistance.

The pump version has highly engineered valve plates for increased selfpriming speed and low noise, available with left and right hand rotation.

The F12 motors produce very high torque at start-up as well as at low speeds. Our unique timing gear design synchronizes shaft and cylinder barrel, making the F12 very tolerant to high 'G' forces and torsional vibrations.

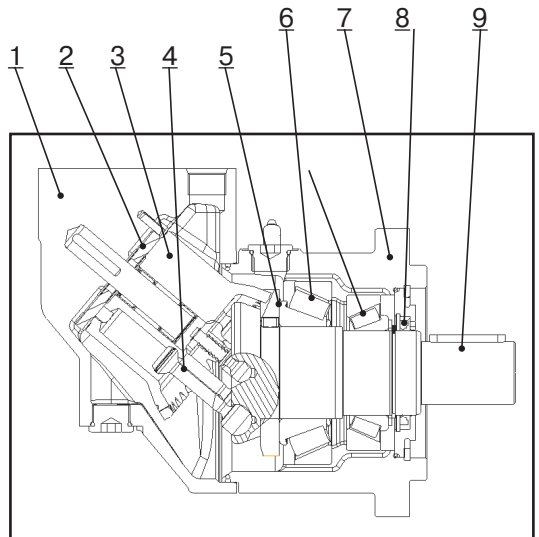
Heavy duty roller bearings permit substantial external axial and radial shaft loads.

The F12's have a simple and straightforward design with very few moving parts, making them very reliable motors/pumps.

The unique piston locking, timing gear and bearing set-up as well as the limited number of parts add up to a very robust design with long service life and, above all, proven reliability.

F12 cross section

1. Barrel housing
2. Valve plate
3. Cylinder barrel
4. Piston with piston ring
5. Timing gear
6. Tapered roller bearing
7. Bearing housing
8. Shaft seal
9. Output/input shaft



Specifications

Series F12

Frame size F12	-030	-040	-060	-080	-090	-110	-125	-152	-162	-182	-250
Displacement [cm ³ /rev]	30.0	40.0	59.8	80.4	93.0	110.1	125.0	149.8	163.1	179.8	242
Operating pressure ³⁾											
max intermittent ¹⁾ [bar]	500	500	500	500	420	480	480	480	480	480	420
max continuous [bar]	450	450	450	450	350	420	420	420	420	420	350
Motor operating speed ³⁾ [rpm]											
max intermittent ¹⁾	8600	6900	6400	5500	5100	4800	4600	4000	4000	4000	3000
max continuous	7300	6300	5800	5100	4600	4400	4200	3700	3700	3700	2700
min continuous	50	50	50	50	50	50	50	50	50	50	50
Max pump selfpriming speed											
L or R function; max [rpm]	3100	2800	2400	2200	2200	2000	2000	1700	1600	1500	1500
Motor input flow											
max intermittent ¹⁾ [l/min]	219	268	347	426	465	528	575	608	648	728	726
max continuous [l/min]	201	244	317	386	428	484	525	547	583	655	653
Drain temperature, max [°C]	115	115	115	115	115	115	115	115	115	115	115
min [°C]	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40
Theoretical torque at 100 bar [Nm]	47.6	63.5	94.9	127.6	147.6	174.8	198.4	241	257	289	384.1
Mass moment of inertia											
(x10 ⁻³) [kg m ²]	1.7	2.9	5	8.4	8.4	11.2	11.2	21	21	21	46
Weight [kg]	11.5	15.7	18.6	25.7	25.7	33	33	40	40	40	77

1) Intermittent: max 6 seconds in any one minute.

Preparation

Before disassembling motor:

- Always keep work space clean
- Always use correct tools
- Make documentation and take photos if required
- Only use standard spare parts from Parker

Changing shaft seal:

Follow step: 8 – 12 and 26 – 30

Changing seal kit:

Follow step: 1 – 2, 7 – 12, 26 – 37

Changing repair kit:

Follow step: 1 – 5, 32 – 37

Changing shaft and bearing kit:

Follow step: 1 – 37

Tools required

- Retaining ring tool, internal and external
- Hex key
- Plastic hammer
- Mandrel
- Hook tool
- Torque wrench
- Brush
- Hydraulic press



Disassemble F12-030 – 125



1. Fasten the unit in a vice.
Loosen the 4 bolts (item 491).



2. Disassemble the barrel housing (item 110). Make sure that the valve plate doesn't fall out when lifting the barrel housing off.

Tips! If the parts are stuck, use a plastic hammer and tap carefully underneath.

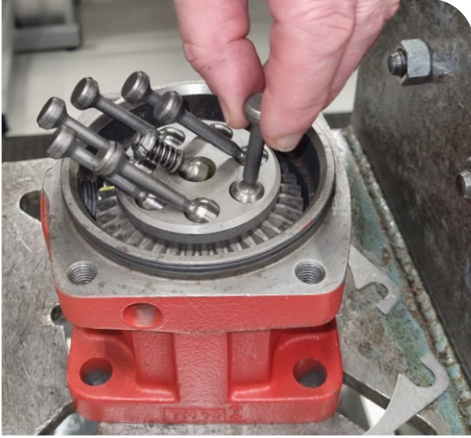


3. When disassembling valve plate (item 121), use a tool like a hook and remove as shown.

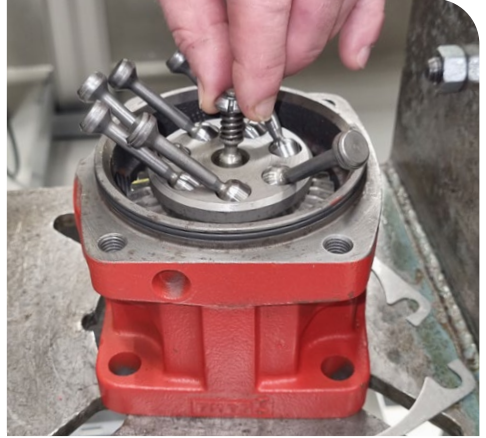


4. Remove the cylinder barrel (item 411)

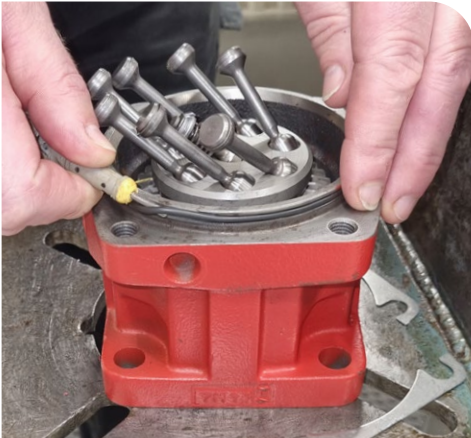
Disassemble F12-030 – 125



5. Remove the pistons (item 440)



6. Remove the barrel support (item 430)

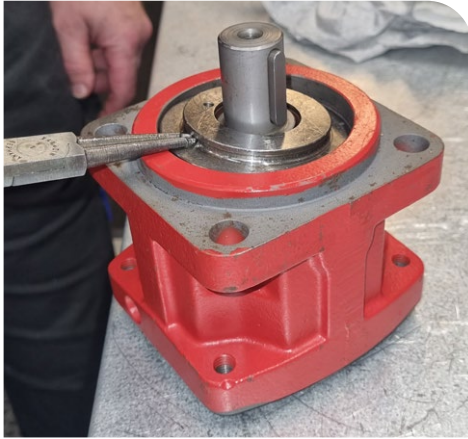


7. Remove the O-ring (item 221)
Always change seal kit when
removing seals



8. Disassemble the retaining ring
(item 237)

Disassemble F12-030 – 125



9. Remove the seal carrier (item 231)



10. Remove the O-ring (item 225)
Always change seal kit when removing seals.



11. Disassemble the retaining ring (item 238)



12. Tap the shaft seal out with hammer and mandrel.

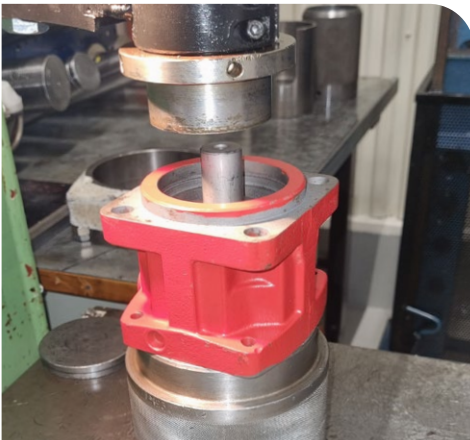
Disassemble F12-030 – 125



13. Disassemble the retaining ring (item 478)

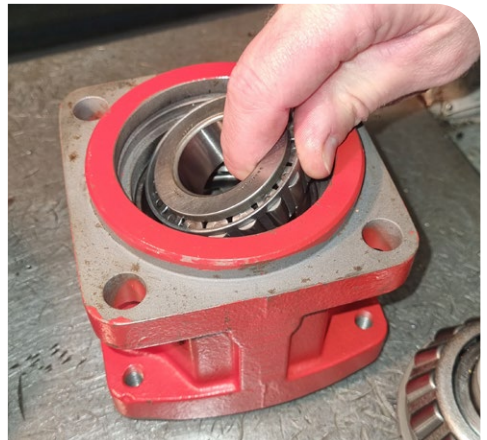


14. Remove the space washer (item 476)



15. Place the bearing housing (item 211) on a tube. Press out the shaft (item 311) by pressing on the shaft end.

Tips! Put some soft material (towel or rag) inside the tube to avoid marks when shaft loosen.



16. Remove the small tapered roller bearing (item 470)

Disassemble F12-030 – 125



17. Tap the small bearing ring with a mandrel and hammer



18. Tap the large bearing ring with a mandrel and hammer



19. Place the ring gear (item 453) on a tube. Press out the shaft (item 311) by pressing on the shaft end.

Tips! Put some soft material (towel or rag) inside the tube to avoid marks when shaft loosen.

Assembly F12-030 – 125



20. If bearings have been disassembled it's recommended to change both tapered bearings, see spare part list for correct bearing kit. Press down the tapered bearing (item 460) and the ring gear (item 452) on the shaft with a press. Bearings are available in bearing kit Use a tube, see page 16.



22. Press down the bearing ring (item 470) in the bearing housing (item 211) with a press. Use a tube that match the outer diameter of the bearing ring.



21. Press down the bearing ring (item 460) in the bearing housing (item 211) with a press. Use a tube that match the outer diameter of the bearing ring.



23. Place the bearing housing (item 211) on the shaft (item 311) and place the small bearing (item 470) on the shaft. Press down the bearing at the same time rotate the bearing housing. Correct bearing preload is achieved when there are no gap or play in the bearings and a small resistance is achieved when rotating the bearing housing.

Assembly F12-030 – 125



24. Install the space washer (item 476). Space washers are available in different thickness, these are included in bearing kit.



25. Install the retaining ring (item 478)
Included in bearing kit
Secure that the retaining ring is correct mounted in the groove and the space washer is tight mounted.
Tips! Use mandrel and hammer to tap carefully to secure that retaining ring is mounted correct.



26. Install the O-ring (item 225)
Included in seal kit
Tips! Use some oil on the O-ring



27. Tap the new shaft seal back with a tube and a hammer.

Assembly F12-030 – 125



28. Assemble the retaining ring (item 238)



29. Install the seal carrier (item 231)

Tips! Protect the shaft seal from shaft edges on shaft.

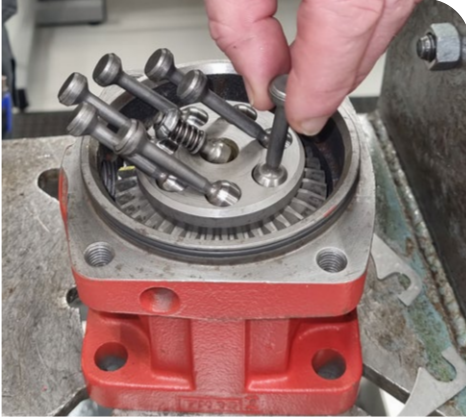


30. Install the retaining ring (item 237)
Included in seal kit
Tips! Tap with mandrel and hammer to secure retaining ring is correct assembled.



31. Install the O-ring (item 221)
Included in seal kit

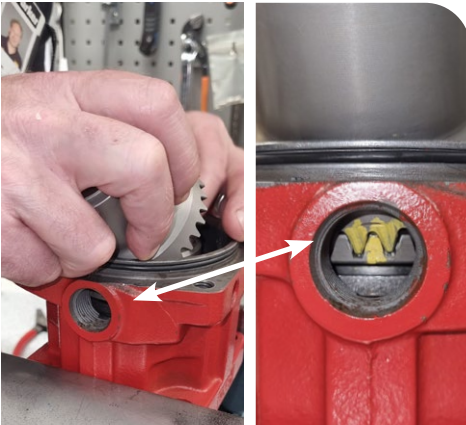
Assembly F12-030 – 125



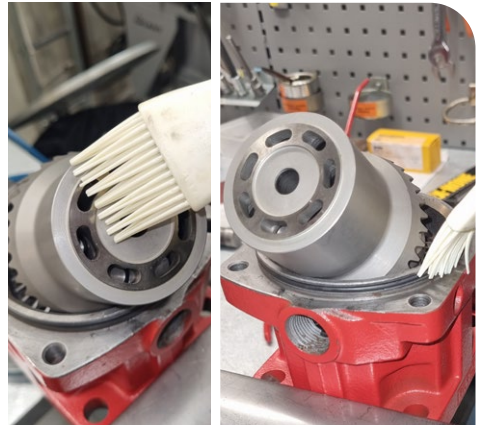
32. Lubricate the ball socket with oil. Install the pistons (item 440), included in repair kit. Make sure that the piston can rotate without any restrictions. Install the barrel support (item 430). Use grease on the support ball to secure it will stay in position.



33. When assembling valve plate (item 121), secure that the groove is correct assembled. Also secure notches as towards the cylinder barrel. Valve plate is available in repair kit. **Tips!** Use the cylinder barrel to tap carefully until valve plate is assembled correct in barrel housing.



34. Install the cylinder barrel (item 411). Ensure correct timing (marking – punch mark on ring gear and cylinder barrel). Wrong assembled timing can cause damage.



35. Use oil on cylinder barrel and O-ring.

Assembly F12-030 – 125



36. Install the barrel housing (item 110) by mount the center pin of barrel housing in the cylinder barrel, move the barrel housing in correct angle.

Install the screws (item 491) and shims (item 488)

Tips! Tap carefully with plastic hammer on Barrel housing.

37. Fasten the 4 bolts (item 491) to specified torque.

F12-030 65 ± 10 Nm

F12-040 65 ± 10 Nm

F12-060 65 ± 10 Nm

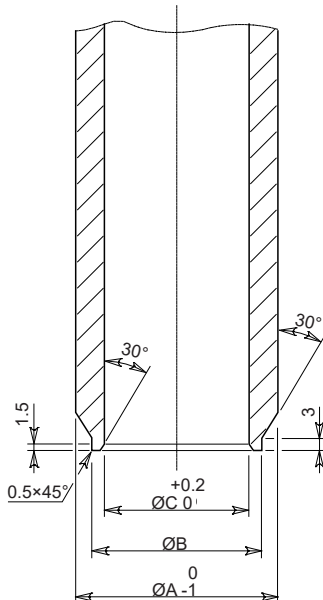
F12-080 115 ± 10 Nm

F12-090 115 ± 10 Nm

F12-110 115 ± 10 Nm

F12-125 115 ± 10 Nm

F12-250 220 ± 35 Nm



Type	øA	øB	øC
F12-030	60	49	42
F12-040	65	58	52
F12-060	73	64	57
F12-080/-090	74	70	62
F12-110/125	82	75	67
F12-250	97	-	82

Valve plates F12



M A = Bi-directional, motor operation
Ex. F12-080-MF-IV-K-000-0000-P0

Against cylinder barrel



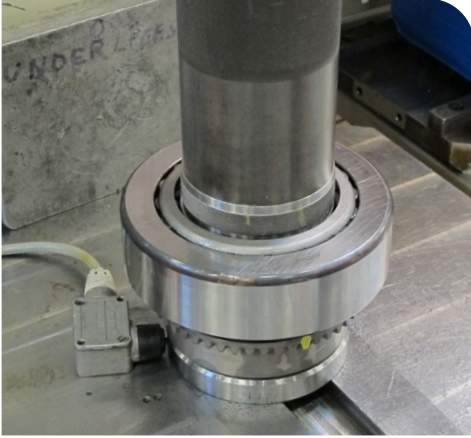
L L = Left (CCW) rotation, pump operation
Ex. F12-080-LF-IV-K-000-0000-P0



R R = Right (CW) rotation, pump operation
Ex. F12-080-RF-IV-K-000-0000-P0

Against cylinder barrel

Assembly F12-250



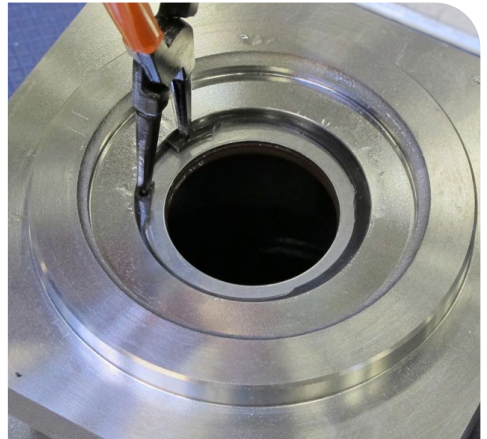
1. Press down the tapered roller bearing (item 460) and the ring gear (item 452) on the shaft with a press. Use a tube (see page 16).



2. Carefully press down the tapered roller bearing (item 470) until correct preload of the bearing package is achieved. Use a tube (see page 16).

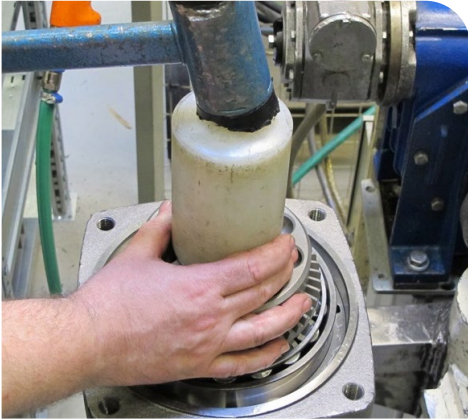


3. Assemble the lock washers (item 474) and the round nut (item 475). Tap in the lock washers to lock the round nut.



4. Assemble the shaft seal (item 233) and the support ring (item 236). Locate the chamfer on the support ring downwards. Tap it down with a plastic collar. Assemble the retaining ring (item 237). Lubricate the shaft seal before assembling the housing.

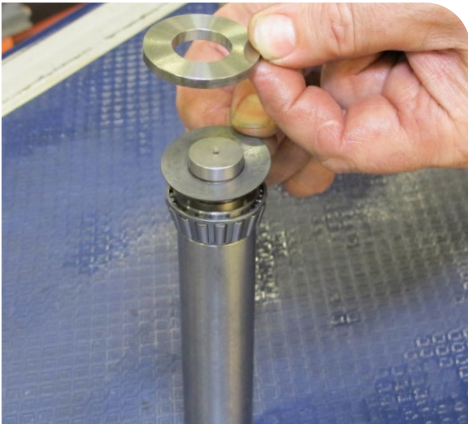
Assembly F12-250



5. Tap down the bearing package into the bearing housing (item 211) by using a plastic collar and a plastic hammer.



6. Assemble the pistons (item 440). Lubricate the ball sockets before assembling.



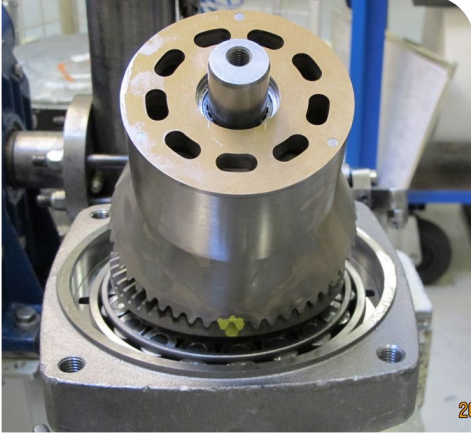
7. Assemble the tap roll bearing (item 425), the disc spring (item 433), the spacer washer (item 426) and the retaining ring (item 427).



8. Press down the bearing ring (item 425), the spacer sleeve (item 422), the needle bearings (item 415) and the retaining ring (item 414).

Locate the needle bearings against the retaining ring. Assemble the spring pins (item 413) and the sliding plate (item 424).

Assembly F12-250



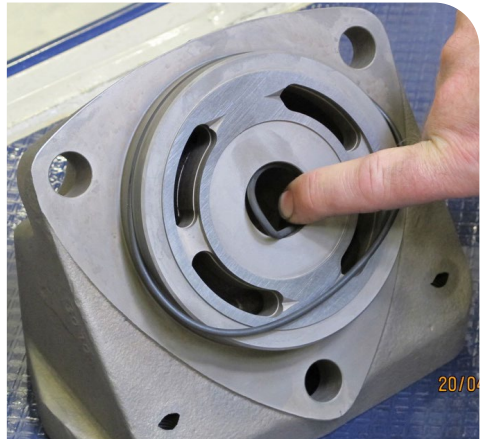
9. Assemble the cylinder barrel (item 411) on the pistons (item 440). Make sure the timing is correct.



10. Assemble the O-ring (item 222) on the barrel housing (item 481). Lubricate the O-ring.



11. Assemble the barrel housing. Make sure the cylinder barrel is in correct position by holding the barrel spindle (item 423). Tap the housing down with a plastic hammer.



12. Assemble the O-rings (item 223 and 224) on the end cap (item 111). Lubricate the O-rings.

Assembly F12-250



13. Place the end cap on to the barrel housing until the O-ring is entered.



14. Fit a long screw (M12) to the barrel spindle and pull the barrel spindle up with a universal pliers.



15. Knock down the end cap with a plastic hammer and fit shims (item 488) and hexagon screws (item 493). Torque the screws to 330 ± 10 Nm.



16. Install the cap screw (item 428) that secures the barrel spindle.

Assembly F12-250



17. Torque the cap screw to 40 – 45 Nm and back off 1/3 of a turn to obtain correct axial play.

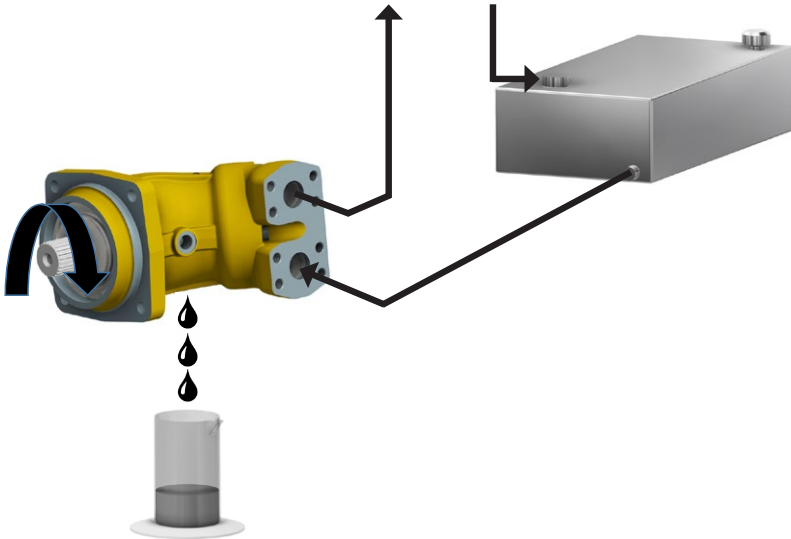


18. Hit the cap screw one time to obtain back-lash. Make sure the back-lash is correct.

Test Procedure

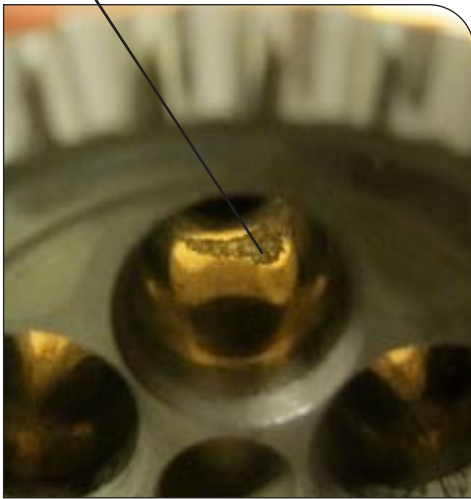
The general condition of the unit can be established by checking the drain flow. Remove the drain line and keep the drain port above a suitable container. Run the unit at 500 rpm and pressurise the system to 200 bar (3000 psi)

Measure the drain flow for one minute; if it exceeds the maximum figures shown below, the unit is worn or damaged internally and should be replaced or repaired. Also, check for leakage at the shaft seal and between the bearing and barrel housings.



Series	Normal (gpm, US)	Normal (l/min)	Max (gpm, US)	Max (l/min)
F12-030	0.12	0.5	0.24	0.9
F12-040	0.16	0.6	0.32	1.2
F12-060	0.24	0.9	0.47	1.8
F12-080	0.32	1.2	0.64	2.4
F12-090	0.37	1.4	0.74	2.8
F12-110	0.44	1.7	0.87	3.3
F12-125	0.50	1.9	0.99	3.8
F12-250	0.64	2.4	1.60	6.1

Cavitation



Cavitation marks in the cylinder barrel bores, on the port side or on the valve plate depends on air in the oil.

Reasons can be when inlet pressure/flow isn't sufficient. Example when stopping a fan drive and inertia will run the motor.



Why cavitation?

- Too high speed
- Too low inlet pressure (pump mode)

What consequence?

- A metallic sound comes from the system
- Material damage as craters in the goods which contaminate the hydraulic system
- Lift off if severe cavitation
- Shaft seal leakage

Cavitation



Valve plate with scratched surface.

The damage depends on contaminated oil due to poor filtration, clogged filter, previous break down or bad handling when filling the reservoir.



Cylinder barrel with severe damaged surface at the porting. The damage depends on contaminated oil due to poor filtration, clogged filter, previous break down or bad handling when filling the reservoir.



Pistons with worn out piston rings, some of them are missing and the spher is very damaged.

This depends on contaminated oil and/or overspeed/cavitation.

Cavitation



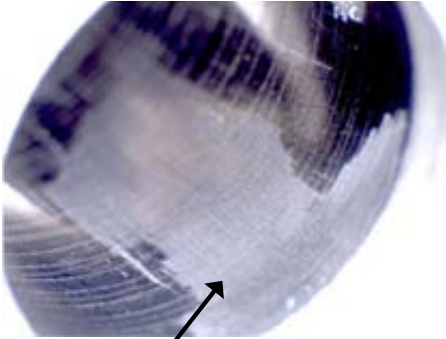
Pistons with the grinding rings intact have been in a clean system. No over-speed and good viscosity on the oil.



Pistons with worn piston ball. The ball is polished due to contaminated oil and/or overspeed.

Note!

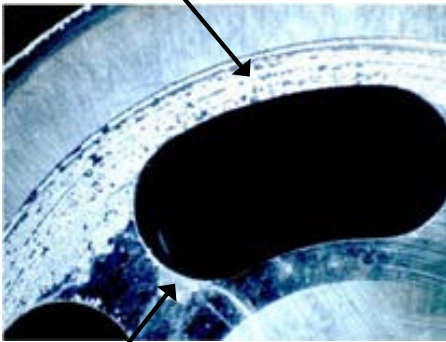
High temperature (low viscosity) can be a reason.

Cavitation

Severe damage in cylinder bore at the pistons turning point.

Reason is too high speed, the piston is thrown out in the periphery and breaks through the protecting oil film.

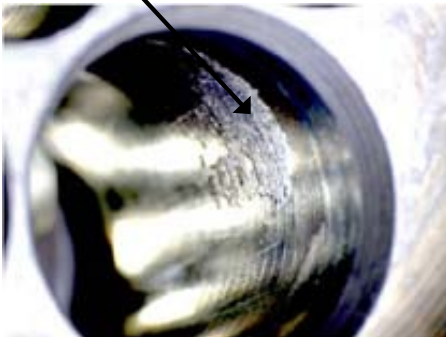
High speed wear



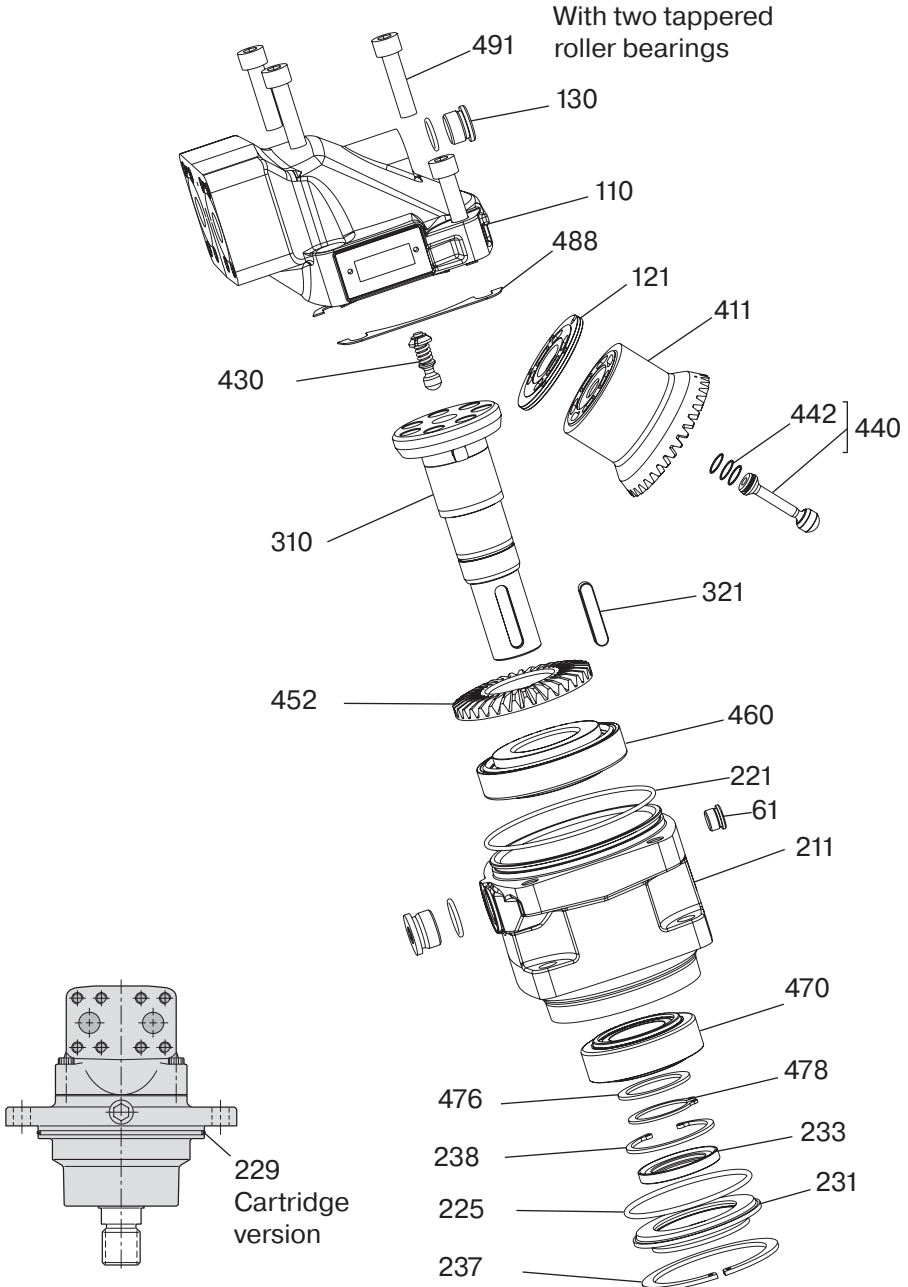
High speed wear at the outer periphery on the cylinder barrel. The protecting oil film can't withstand the high speed.

There are also cavitation marks on the cylinder barrel.

Cavitation



From the same cylinder barrel there are severe cavitation marks in the cylinder bores due to high speed.



Parts specification

Item	Description
61	Hex Socket Plug Assy
110	Barrel housing
121	Valve Plate (repair kit)
130	Hex Socket Plug Assy
211	Bearing Housing
221	O-Ring (seal kit)
225	O-Ring (seal kit)
229	O-Ring (seal kit)
231	Seal Carrier
233	Shaft Seal (seal kit)
237	Retaining Ring (seal kit)
310	Shaft
321	Key
411	Cylinder Barrel Assy (repair kit)
430	Barrel Support
440	Piston Assy (repair kit)
452	Ring Gear
460	Tap Roller Bearing (bearing kit)
470	Tap Roller Bearing (bearing kit)
476	Spacer Washer (bearing kit)
478	Retaining Ring (bearing kit)
488	Shims (shim kit)
491	Hex Screw (repair kit)

F12-030 all types from serial no. 201809300001 and up.

Pos	Part No	Description	Qty	Remarks
Housing parts				
61		Hex Socket Plug M12*1	1	VSTI12X1EDVITCF
110	3721864	Barrel Housing Assy Type F	1	
110	3721863	Barrel Housing Assy Type S	1	
130		Hex Socket Plug for S housing	1	8 HP50N-S
130		Hex Socket Plug for F housing	1	VSTI18X1,5EDVITCF
211	3784481	Bearing Housing Type C	1	Require item 61
211	3788317	Bearing Housing Type I	1	Require item 61
211	3788323	Bearing Housing Type S	1	Require item 61
211	3788320	Bearing Housing Type T	1	Require item 61
231	3797194	Seal Carrier	1	
Rotating parts				
310	3799648	Shaft type C	1	
310	3799638	Shaft type D	1	
310	3799632	Shaft type K	1	Require flat key
310	3799644	Shaft type P	1	Require flat key
310	3799634	Shaft type S	1	
310	3799640	Shaft type T	1	Require flat key
321	3724437*	Flat Key for K and P shaft	1	
321	3724449*	Flat Key for T shaft	1	
430	3724477**	Barrel Support	1	
452	3791927	Ring Gear	1	

For other parts please contact Parker Hannifin**Seal kits**

3793493	Sealing kit type V FPM
3785132	Sealing kit type N NBR
3784552	Sealing kit type S PTFE
3720898	Sealing kit type S SuperCut 100

Repair Spare part Kit

3721446	Type M (Motor)
3722010	Type S (High speed Motor)
3723977	Type L (CCW pump)
3723978	Type R (CW pump)

Bearing spare part kit

3723971	Bearing kit
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Shim kit

3721330	Shims kit
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*Kit contain 100 pcs, **Kit contain 20 pcs

Seal kit contain:

O-rings pos: 221, 225, 229
 Shaft seal pos: 233
 Retaining rings pos: 237, 238

Repair spare part kit contain:

Valve plate pos: 121
 Cylinder Barrel pos: 411
 Pistons pos: 440 (7 pcs)
 Hex Screws pos: 491 (4 pcs)

Bearing spare part kit contain:

Tap Rol Bearing pos: 460, 470
 Spacer pos: 476
 Retaining rings pos: 478

Shim kit contain:

Shims pos: 488
 (1 pcs on each side)

F12-040 all types from serial no. 1998020001 up to 202211010001. (for serial no between 202211010001-202305310001, please contact Parker)

Pos	Part No	Description	Qty	Remarks
Housing parts				
61		Hex Socket Plug M12*1	1	VSTI12X1EDVITCF
110		Barrel Housing Assy Type F	1	
110		Barrel Housing Assy Type S	1	
130		Hex Socket Plug for S housing	1	8 HP50N-S
130		Hex Socket Plug for F housing	1	VSTI18X1,5EDVITCF
211	3780330	Bearing Housing Type C	1	Require item 61
211	3799967	Bearing Housing Type I	1	Require item 61
211	3780130	Bearing Housing Type S	1	Require item 61
231	3796201	Seal Carrier	1	
Rotating parts				
310	3799455	Shaft type C	1	
310	3799457	Shaft type D	1	
310	3799451	Shaft type K	1	Require flat key
310	3799453	Shaft type S	1	
310	3799459	Shaft type T	1	Require flat key
321	3724451*	Flat Key for K shaft	1	
321	3724438*	Flat Key for T shaft	1	
430	3724474***	Barrel Support	1	
452	3791589	Ring Gear	1	

For other parts please contact Parker Hannifin

Seal kits

- 3793495** Sealing kit type V FPM
3785133** Sealing kit type N NBR

Repair Spare part Kit

- 3787798 Type M (Motor)
3723979 Type L (CCW pump)
3723980 Type R (CW pump)

Bearing spare part kit

- 3723972 Bearing kit

Shim kit

- 3721331 Shims kit

Seal kit contain:

O-rings pos: 221, 225, 229
Shaft seal pos: 233
Retaining rings pos: 237, 238

Repair spare part kit contain:

Valve plate pos: 121
Cylinder Barrel pos: 411
Pistons pos: 440 (7 pcs)
Hex Screws pos: 491 (4 pcs)

Bearing spare part kit contain:

Tap Rol Bearing pos: 460, 470
Spacer pos: 476
Retaining rings pos: 478

Shim kit contain:

Shims pos: 488
(1 pcs on each side)

*Kit contain 100 pcs, ***Kit contain 20 pcs

** The kit contain 1 pcs O-ring for F12-60

F12-040 all types from serial no. 202305310001. (for serial no between 202211010001 -202305310001, please contact Parker)

Pos	Part No	Description	Qty	Remarks
Housing parts				
61		Hex Socket Plug M12*1	1	VSTI12X1EDVITCF
110	3724205	Barrel Housing Assy Type F	1	
110	3724204	Barrel Housing Assy Type S	1	
130		Hex Socket Plug for S housing	1	8 HP50N-S
130		Hex Socket Plug for F housing	1	VSTI18X1,5EDVITCF
211	3780330	Bearing Housing Type C	1	Require item 61
211	3799967	Bearing Housing Type I	1	Require item 61
211	3780130	Bearing Housing Type S	1	Require item 61
231	3796201	Seal Carrier	1	
Rotating parts				
310	3799455	Shaft type C	1	
310	3799457	Shaft type D	1	
310	3799451	Shaft type K	1	Require flat key
310	3799453	Shaft type S	1	
310	3799459	Shaft type T	1	Require flat key
321	3724451*	Flat Key for K shaft	1	
321	3724438*	Flat Key for T shaft	1	
430	3722036***	Barrel Support	1	
452	3791589	Ring Gear	1	

For other parts please contact Parker Hannifin

Seal kits

- 3793495** Sealing kit type V FPM
3785133** Sealing kit type N NBR

Repair Spare part Kit

- 3724636 Type M (Motor)
3724637 Type L (CCW pump)
3724638 Type R (CW pump)

Bearing spare part kit

- 3723972 Bearing kit

Shim kit

- 3721331 Shims kit

Seal kit contain:

O-rings pos: 221, 225, 229
Shaft seal pos: 233
Retaining rings pos: 237, 238

Repair spare part kit contain:

Valve plate pos: 121
Cylinder Barrel pos: 411
Pistons pos: 440 (7 pcs)
Hex Screws pos: 491 (4 pcs)

Bearing spare part kit contain:

Tap Rol Bearing pos: 460, 470
Spacer pos: 476
Retaining rings pos: 478

Shim kit contain:

Shims pos: 488
(1 pcs on each side)

*Kit contain 100 pcs, ***Kit contain 20 pcs

** The kit contain 1 pcs O-ring for F12-60

**F12-060 all types from serial no. 1998020001 up to 202011010001.
(for serial no between 202011010001 -202101010001, please contact
Parker)**

Pos	Part No	Description	Qty	Remarks
Housing parts				
61		Hex Socket Plug M12*1	1	VSTI12X1EDVITCF
110		Barrel Housing Assy	1	Not available
130		Hex Socket Plug	1	See next side
211	3780331	Bearing Housing Type C	1	Require item 61
211	3780127	Bearing Housing Type I	1	Require item 61
211	3780124	Bearing Housing Type S	1	Require item 61
231	3796201	Seal Carrier	1	
Rotating parts				
310	3799686	Shaft type C	1	
310	3799688	Shaft type D	1	
310	3799682	Shaft type K	1	Require flat key
310	3799684	Shaft type S	1	
310	3799690	Shaft type T	1	Require flat key
321	3724445*	Flat Key for K shaft	1	
321	3724438*	Flat Key for T shaft	1	
430	3724478***	Barrel Support	1	
452	3799822	Ring Gear	1	

For other parts please contact Parker Hannifin

Seal kits

- 3793495** Sealing kit type V FPM
3785133** Sealing kit type N NBR

Repair Spare part Kit

- 3787799 Type M (Motor)

Bearing spare part kit

- 3723973 Bearing kit

Shim kit

- 3721332 Shims kit

Seal kit contain:

O-rings pos: 221, 225, 229
Shaft seal pos: 233
Retaining rings pos: 237, 238

Repair spare part kit contain:

Valve plate pos: 121
Cylinder Barrel pos: 411
Pistons pos: 440 (7 pcs)
Hex Screws pos: 491 (4 pcs)

Bearing spare part kit contain:

Tap RoI Bearing pos: 460, 470
Spacer pos: 476
Retaining rings pos: 478

Shim kit contain:

Shims pos: 488
(1 pcs on each side)

*Kit contain 100 pcs, ***Kit contain 20 pcs

** The kit contain 1 pcs O-ring for F12-40

F12-060 with needle bearings from serial no. 202011010001 and up.

Pos	Part No	Description	Qty	Remarks
Housing parts				
61		Hex Socket Plug M12*1	1	VSTI12X1EDVITCF
110	3722721	Barrel Housing Assy Type F	1	
110	3722723	Barrel Housing Assy Type S	1	
130		Hex Socket Plug S housing	1	10 HP50N-S
130		Hex Socket Plug F housing	1	VSTI22X1.5EDVITCF
211	3780331	Bearing Housing Type C	1	Require item 61
211	3780127	Bearing Housing Type I	1	Require item 61
211	3780124	Bearing Housing Type S	1	Require item 61
231	3796201	Seal Carrier	1	
Rotating parts				
310	3799686	Shaft type C	1	
310	3799688	Shaft type D	1	
310	3799682	Shaft type K	1	Require flat key
310	3799684	Shaft type S	1	
310	3799690	Shaft type T	1	Require flat key
321	3724445*	Flat Key for K shaft	1	
321	3724438*	Flat Key for T shaft	1	
430	3724478***	Barrel Support	1	
452	3799822	Ring Gear	1	

For other parts please contact Parker Hannifin**Seal kits**

3793495** Sealing kit type V FPM

3785133** Sealing kit type N NBR

Repair Spare part Kit

3723104 Type M (Motor)

3723981 Type L (CCW pump)

3723982 Type R (CW pump)

Bearing spare part kit

3723973 Bearing kit

Shim kit

3721332 Shims kit

Seal kit contain:

O-rings pos: 221, 225, 229

Shaft seal pos: 233

Retaining rings pos: 237, 238

Repair spare part kit contain:

Valve plate pos: 121

Cylinder Barrel pos: 411

Pistons pos: 440 (7 pcs)

Hex Screws pos: 491 (4 pcs)

Bearing spare part kit contain:

Tap Rol Bearing pos: 460, 470

Spacer pos: 476

Retaining rings pos: 478

Shim kit contain:

Shims pos: 488

(1 pcs on each side)

*Kit contain 100 pcs, ***Kit contain 20 pcs

** The kit contain 1 pcs O-ring for F12-40

F12-080 all types from serial no. 1998020001 up to 202211010001. (for serial no between 202211010001-202305310001, please contact Parker)

Pos	Part No	Description	Qty	Remarks
Housing parts				
61		Hex Socket Plug M12* 1	1	VSTI12X1EDVITCF
110		Barrel Housing Assy Type F	1	
110		Barrel Housing Assy Type S	1	
130		Hex Socket Plug S housing	1	10 HP5ON-S
130		Hex Socket Plug F housing	1	VSTI22X1.5EDVITCF
211	3780327	Bearing Housing Type C	1	Require item 61
211	3780813	Bearing Housing Type I	1	Require item 61
211	3780812	Bearing Housing Type S	1	Require item 61
231	3796200	Seal Carrier	1	
Rotating parts				
310	3780671	Shaft type C	1	
310	3780673	Shaft type D	1	
310	3780667	Shaft type K	1	Require flat key
310	3780669	Shaft type S	1	
310	3780675	Shaft type T	1	Require flat key
310	3780677	Shaft type U	1	
321	3724448*	Flat Key for K shaft	1	
321	3724440*	Flat Key for T shaft	1	
430	3724475**	Barrel Support	1	
452	3787847	Ring Gear	1	

Seal kit contain:

O-rings pos: 221, 225, 229
 Shaft seal pos: 233
 Retaining rings pos: 237, 238

For other parts please contact Parker Hannifin

Seal kits

3793499	Sealing kit type V FPM
3785136	Sealing kit type N NBR

Repair Spare part Kit

3787800	Type M (Motor)
3723983	Type L (CCW pump)
3723984	Type R (CW pump)

Bearing spare part kit

3723974	Bearing kit
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Shim kit

3721333	Shims kit
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Repair spare part kit contain:

Valve plate pos: 121
 Cylinder Barrel pos: 411
 Pistons pos: 440 (7 pcs)
 Hex Screws pos: 491 (4 pcs)

Bearing spare part kit contain:

Tap Rol Bearing pos: 460, 470
 Spacer pos: 476
 Retaining rings pos: 478

Shim kit contain:

Shims pos: 488
 (1 pcs on each side)

*Kit contain 100 pcs, **Kit contain 20 pcs

F12-080 all types from serial no. 202305310001. (for serial no between 202211010001-202305310001, please contact Parker)

Pos	Part No	Description	Qty	Remarks
Housing parts				
61		Hex Socket Plug M12* 1	1	VSTI12X1EDVITCF
110	3724001	Barrel Housing Assy Type F	1	
110	3724000	Barrel Housing Assy Type S	1	
130		Hex Socket Plug S housing	1	10 HP5ON-S
130		Hex Socket Plug F housing	1	VSTI22X1.5EDVITCF
211	3780327	Bearing Housing Type C	1	Require item 61
211	3780813	Bearing Housing Type I	1	Require item 61
211	3780812	Bearing Housing Type S	1	Require item 61
231	3796200	Seal Carrier	1	
Rotating parts				
310	3780671	Shaft type C	1	
310	3780673	Shaft type D	1	
310	3780667	Shaft type K	1	Require flat key
310	3780669	Shaft type S	1	
310	3780675	Shaft type T	1	Require flat key
310	3780677	Shaft type U	1	
321	3724448*	Flat Key for K shaft	1	
321	3724440*	Flat Key for T shaft	1	
430	3721483**	Barrel Support	1	
452	3787847	Ring Gear	1	

Seal kit contain:

O-rings pos: 221, 225, 229
 Shaft seal pos: 233
 Retaining rings pos: 237, 238

For other parts please contact Parker Hannifin

Seal kits

3793499 Sealing kit type V FPM

3785136 Sealing kit type N NBR

Repair Spare part Kit

3724177 Type M (Motor)

3724180 Type L (CCW pump)

3724179 Type R (CW pump)

Bearing spare part kit

3723974 Bearing kit

Shim kit

3721333 Shims kit

Repair spare part kit contain:

Valve plate pos: 121
 Cylinder Barrel pos: 411
 Pistons pos: 440 (7 pcs)
 Hex Screws pos: 491 (4 pcs)

Bearing spare part kit contain:

Tap Rol Bearing pos: 460, 470
 Spacer pos: 476
 Retaining rings pos: 478

Shim kit contain:

Shims pos: 488
 (1 pcs on each side)

*Kit contain 100 pcs, **Kit contain 20 pcs

F12-090 all types from serial no. 1998020001 up to 202211010001. (for serial no between 202211010001-202305310001, please contact Parker)

Pos	Part No	Description	Qty	Remarks
Housing parts				
61		Hex Socket Plug M12* 1	1	VSTI12X1EDVITCF
110		Barrel Housing Assy Type F	1	
110		Barrel Housing Assy Type S	1	
130		Hex Socket Plug S housing	1	10 HP5ON-S
130		Hex Socket Plug F housing	1	VSTI22X1.5EDVITCF
211	3780327	Bearing Housing Type C	1	Require item 61
211	3780813	Bearing Housing Type I	1	Require item 61
211	3780812	Bearing Housing Type S	1	Require item 61
231	3796200	Seal Carrier	1	
Rotating parts				
310	3780671	Shaft type C	1	
310	3780673	Shaft type D	1	
310	3780667	Shaft type K	1	Require flat key
310	3780669	Shaft type S	1	
310	3780675	Shaft type T	1	Require flat key
310	3780677	Shaft type U	1	
321	3724448*	Flat Key for K shaft	1	
321	3724440*	Flat Key for T shaft	1	
430	3724475**	Barrel Support	1	
452	3787847	Ring Gear	1	

Seal kit contain:
 O-rings pos: 221, 225, 229
 Shaft seal pos: 233
 Retaining rings pos: 237, 238

For other parts please contact Parker Hannifin

Seal kits	
3793499	Sealing kit type V FPM
3785136	Sealing kit type N NBR

Repair Spare part Kit	
3787801	Type M (Motor)
3723985	Type L (CCW pump)
3723986	Type R (CW pump)

Bearing spare part kit	
3723974	Bearing kit

Shim kit	
3721333	Shims kit

Repair spare part kit contain:
 Valve plate pos: 121
 Cylinder Barrel pos: 411
 Pistons pos: 440 (7 pcs)
 Hex Screws pos: 491 (4 pcs)

Bearing spare part kit contain:
 Tap Rol Bearing pos: 460, 470
 Spacer pos: 476
 Retaining rings pos: 478

Shim kit contain:
 Shims pos: 488
 (1 pcs on each side)

*Kit contain 100 pcs, **Kit contain 20 pcs

F12-090 all types from serial no. 202305310001. (for serial no between 202211010001-202305310001, please contact Parker)

Pos	Part No	Description	Qty	Remarks
Housing parts				
61		Hex Socket Plug M12* 1	1	VSTI12X1EDVITCF
110	3724001	Barrel Housing Assy Type F	1	
110	3724000	Barrel Housing Assy Type S	1	
130		Hex Socket Plug S housing	1	10 HP5ON-S
130		Hex Socket Plug F housing	1	VSTI22X1.5EDVITCF
211	3780327	Bearing Housing Type C	1	Require item 61
211	3780813	Bearing Housing Type I	1	Require item 61
211	3780812	Bearing Housing Type S	1	Require item 61
231	3796200	Seal Carrier	1	
Rotating parts				
310	3780671	Shaft type C	1	
310	3780673	Shaft type D	1	
310	3780667	Shaft type K	1	Require flat key
310	3780669	Shaft type S	1	
310	3780675	Shaft type T	1	Require flat key
310	3780677	Shaft type U	1	
321	3724448*	Flat Key for K shaft	1	
321	3724440*	Flat Key for T shaft	1	
430	3721483**	Barrel Support	1	
452	3787847	Ring Gear	1	

Seal kit contain:

O-rings pos: 221, 225, 229

Shaft seal pos: 233

Retaining rings pos: 237, 238

For other parts please contact Parker Hannifin

Seal kits

3793499 Sealing kit type V FPM

3785136 Sealing kit type N NBR

Repair Spare part Kit

3724178 Type M (Motor)

3724181 Type L (CCW pump)

3724182 Type R (CW pump)

Bearing spare part kit

3723974 Bearing kit

Shim kit

3721333 Shims kit

Repair spare part kit contain:

Valve plate pos: 121

Cylinder Barrel pos: 411

Pistons pos: 440 (7 pcs)

Hex Screws pos: 491 (4 pcs)

Bearing spare part kit contain:

Tap Rol Bearing pos: 460, 470

Spacer pos: 476

Retaining rings pos: 478

Shim kit contain:

Shims pos: 488

(1 pcs on each side)

*Kit contain 100 pcs, **Kit contain 20 pcs

F12-110 from serial no. 200402010001 and up.

Pos	Part No	Description	Qty	Remarks
Housing parts				
61		Hex Socket Plug M12*1	1	VSTI12X1EDVITCF
110	3709914	Barrel Housing Assy Type F	1	
110	3794372	Barrel Housing Assy Type S	1	
130		Hex Socket Plug S housing	1	12 HP50N-S
130		Hex Socket Plug F housing	1	VSTI22X1.5EDVITCF
211	3781449	Bearing Housing Type C	1	Require item 61
211	3781447	Bearing Housing Type I	1	Require item 61
211	3781448	Bearing Housing Type S	1	Require item 61
231	3796182	Seal Carrier	1	
Rotating parts				
310	3783323	Shaft type C	1	
310	3783322	Shaft type D	1	
310	3783321	Shaft type K	1	Require flat key
310	3783320	Shaft type S	1	
310	3783324	Shaft type T	1	Require flat key
321	3724446*	Flat Key for K shaft	1	
321	3724439*	Flat Key for T shaft	1	
430	3724476**	Barrel Support	1	
452	3783319	Ring Gear	1	

For other parts please contact Parker Hannifin

Seal kits	
3798092	Sealing kit type V FPM
3785137	Sealing kit type N NBR
Repair Spare part Kit	
3787802	Type M (Motor)
3723987	Type L (CCW pump)
3723988	Type R (CW pump)
Bearing spare part kit	
3723975	Bearing kit
Shim kit	
3721334	Shims kit

Seal kit contain:

O-rings pos: 221, 225, 229

Shaft seal pos: 233

Retaining rings pos: 237, 238

Repair spare part kit contain:

Valve plate pos: 121

Cylinder Barrel pos: 411

Pistons pos: 440 (7 pcs)

Hex Screws pos: 491 (4 pcs)

Bearing spare part kit contain:

Tap Rol Bearing pos: 460, 470

Spacer pos: 476

Retaining rings pos: 478

Shim kit contain:

Shims pos: 488

(1 pcs on each side)

*Kit contain 100 pcs, **Kit contain 20 pcs

Pos	Part No	Description	Qty	Remarks
Housing parts				
61		Hex Socket Plug M12*1	1	VSTI12X1EDVITCF
110	3709914	Barrel Housing Assy Type F	1	
110	3794372	Barrel Housing Assy Type S	1	
130		Hex Socket Plug S housing	1	12 HP50N-S
130		Hex Socket Plug F housing	1	VSTI22X1.5EDVITCF
211	3781449	Bearing Housing Type C	1	Require item 61
211	3781447	Bearing Housing Type I	1	Require item 61
211	3781448	Bearing Housing Type S	1	Require item 61
231	3796182	Seal Carrier	1	
Rotating parts				
310	3783323	Shaft type C	1	
310	3783322	Shaft type D	1	
310	3783321	Shaft type K	1	Require flat key
310	3783320	Shaft type S	1	
310	3783324	Shaft type T	1	Require flat key
321	3724446*	Flat Key for K shaft	1	
321	3724439*	Flat Key for T shaft	1	
430	3724476**	Barrel Support	1	
452	3783319	Ring Gear	1	

For other parts please contact Parker Hannifin

Seal kits

3798092	Sealing kit type V FPM
3785137	Sealing kit type N NBR

Repair Spare part Kit

3787803	Type M (Motor)
3723989	Type L (CCW pump)
3723990	Type R (CW pump)

Bearing spare part kit

3723975	Bearing kit
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Shim kit

3721334	Shims kit
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Seal kit contain:

O-rings pos: 221, 225, 229
 Shaft seal pos: 233
 Retaining rings pos: 237, 238

Repair spare part kit contain:

Valve plate pos: 121
 Cylinder Barrel pos: 411
 Pistons pos: 440 (7 pcs)
 Hex Screws pos: 491 (4 pcs)

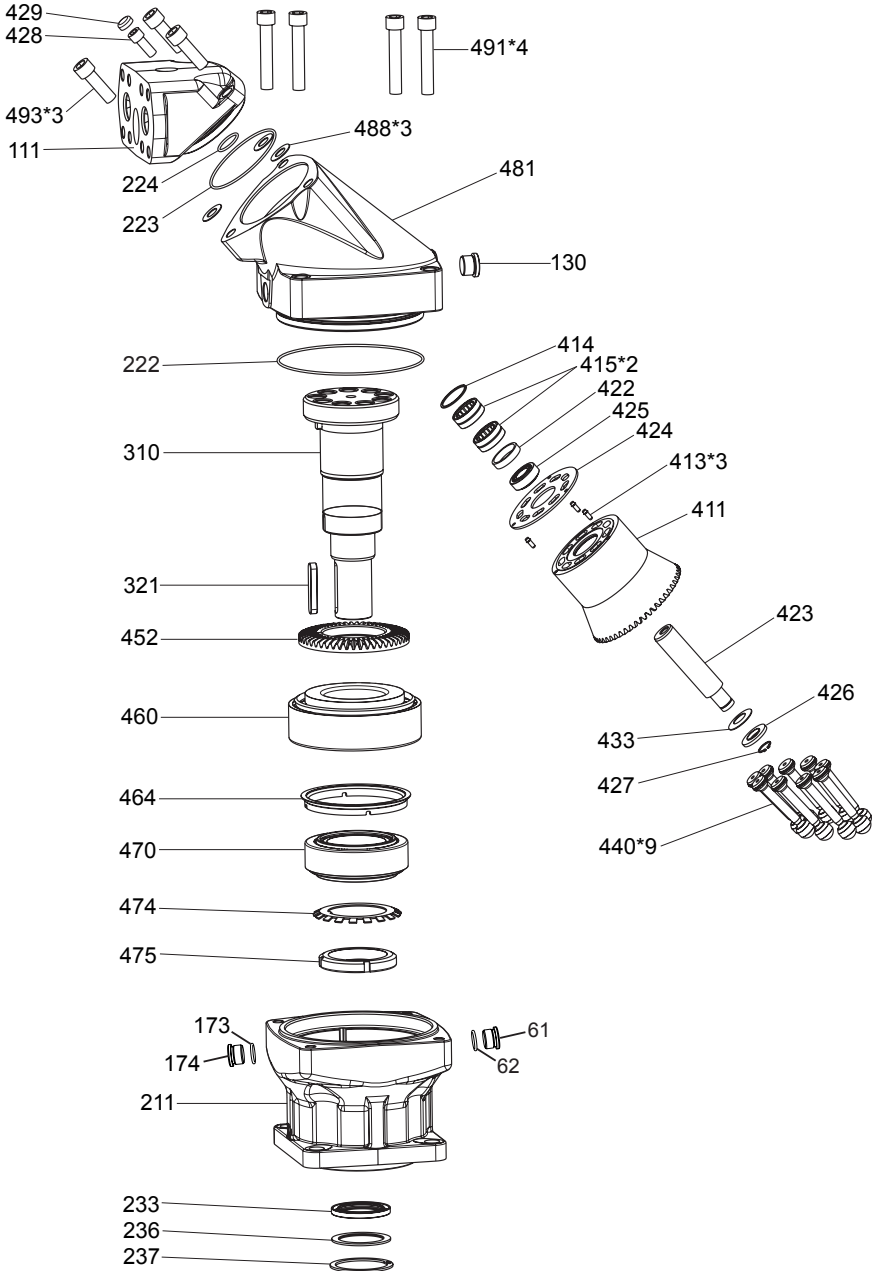
Bearing spare part kit contain:

Tap Rol Bearing pos: 460, 470
 Spacer pos: 476
 Retaining rings pos: 478

Shim kit contain:

Shims pos: 488
 (1 pcs on each side)

*Kit contain 100 pcs, **Kit contain 20 pcs



Parts specification

Item	Description	Kit
61	Hex Socket Plug Assy	
111	End Cap	
130	Hex Socket Plug Assy	
174	Hex Socket Plug Assy	
211	Bearing Housing	
222	O-ring	Seal Kit
223	O-ring	Seal Kit
224	O-ring	Seal Kit
233	Shaft Seal	Seal Kit
236	Back Up Ring	Seal Kit
237	Retaining Ring	Seal Kit
310	Shaft	
321	Flat Key	
411	Cylinder Barrel	Repair Kit
413	Guide Pin	Repair Kit
414	Retaining Ring	Repair Kit
415	Needle Bearing	Repair Kit
422	Spacer Sleeve	Repair Kit
423	Barrel Spindle	Repair Kit
424	Sliding Plate	Repair Kit
425	Tap Rol Bearing	Repair Kit
426	Spacer Washer	Repair Kit
427	Retaining Ring	Repair Kit
428	Hex Skt Screw	Seal Kit/Repair Kit
429	Cap Plug	Seal Kit/Repair Kit
433	Disc Spring	Repair Kit
440	Piston Assy	Repair Kit
452	Ring Gear	
460	Tap Rol Bearing	Bearing Kit
464	Spacer Ring	Bearing Kit
470	Tap Rol Bearing	Bearing Kit
474	Lock Washer	Bearing Kit
475	Round Nut	Bearing Kit
481	Barrel Housing	
488	Shim	Shim Kit
491	Hex Skt Screw	Repair Kit
493	Hex Skt Screw	Repair Kit

Pos	Part No	Description	Qty	Remarks
Housing parts				
61		Hex Socket Plug M12*1	1	VSTI12X1EDVITCF
111	3795856	End Cap QF Motor	1	
130		Hex Socket Plug	1	VSTI3/4EDVITCF
174		Hex Socket Plug	1	VSTI12X1EDVITCF
211	3787080	Bearing Housing Type S	1	Require item 130 174 251
251		Hex Socket Plug	1	4 HP5ON-S
481	3788726	Barrel housing	1	Require item 61
Rotating parts				
310	3788751	Shaft type K	1	Require flat key
310	3789501	Shaft type F	1	
310	3788839	Shaft type S	1	
321	3724446*	Flat Key for K shaft	1	
452	3787126	Ring Gear	1	

For other parts please contact Parker Hannifin

	Seal kits
3797126	Sealing kit type V FPM
	Repair Spare part Kit
3723738	REPAIR SPARE KIT F12-250
	Bearing spare part kit
3723976	Bearing kit
	Shim kit
3721336	Shims kit

Seal kit contain:

O-rings pos: 222, 223, 224
 Shaft seal pos: 233
 Back up ring pos: 236
 Retaining rings pos: 237
 Hex Screw pos: 428, 429

Repair spare part kit contain pos:

411,413, 414, 415, 422,423,
 424, 425, 426, 427, 428, 429,
 433, 440, 491, 493

Bearing spare part kit contain:

Tap Rol Bearing pos: 460, 470
 Spacer ring pos: 464
 Lock washer pos: 474
 Round nut pos: 475

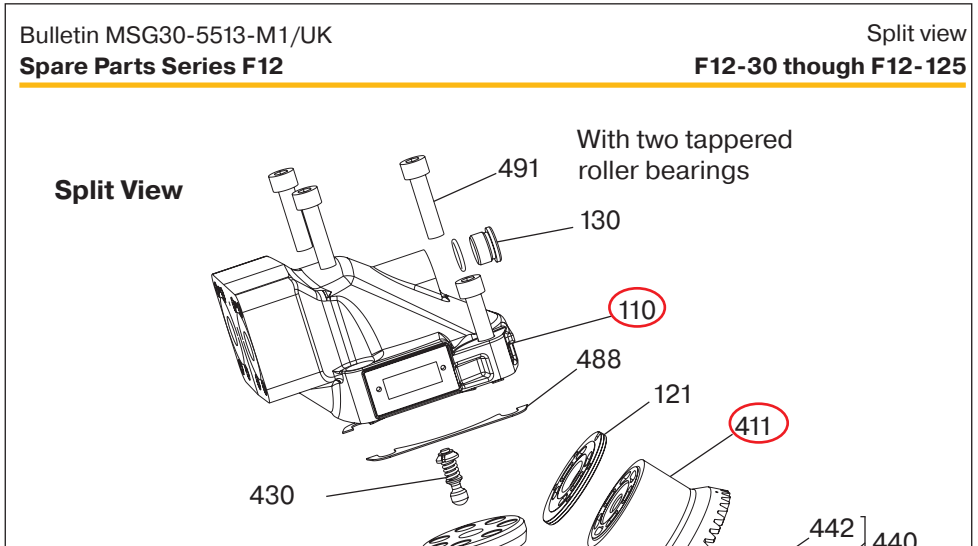
Shim kit contain:

Shims pos: 488
 (1 pcs on each side)

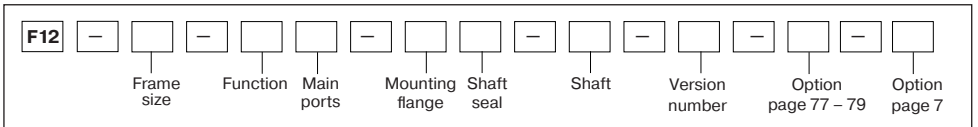
*Kit contain 100 pcs

How to Properly Select a F11/F12 Spare Part

The first page of spare parts bulletin will display a “split view” drawing with the parts identified with numbers shown in red below.



For our example we will be using the description F12-030-MS-SV-T-000-0000-P0 which has the part number 3721581 associated with it. The part number is the number used to order the motor and takes precedence over the description.



The pages we may need to use are the “split view” and the parts list for the particular motor size. In our example **F12-030-MS-SV-T-000-0000-P0**, “**F12-030**” is the size of the motor, and we need to turn to that particular page.

Bulletin MSG30-5513-M1/UK
Spare Parts Series F12

Service Manual/Spare Parts
F12-30

F12-030 all types from serial no. 201809300001 and up.

Pos	Part No	Description	Qty	Remarks
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The motor must be within the serial number range (red line) Serial number is described as YYYYMMDD****. Always contact Parker Division if your unit is produced prior to serial number

The columns are defined as:

Pos. – The number from the split view that identifies the part

Part Number – The number needed to purchase that part

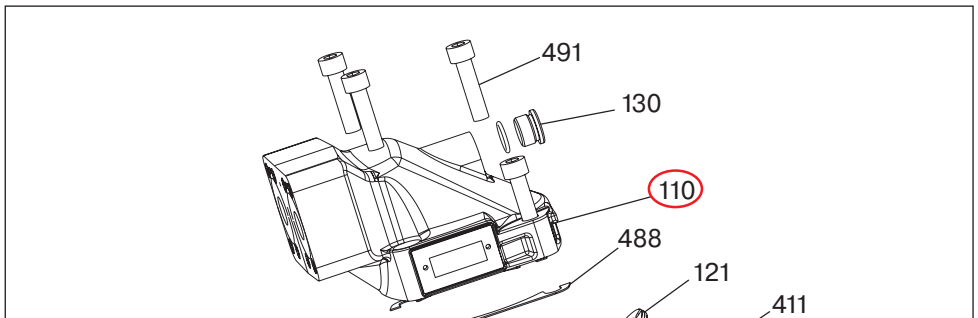
Description – The description of the part and the matching model code character

Quantity – The number of that particular part you need to order for one unit

Remarks – These can give you extra information to define the part

For motor F12-030-MS-SV-T-000-0000-P0 we need the barrel housing, shaft, and shaft seal.

For the barrel housing we can find the part a couple of ways. If there is visual recognition of the part, then the item number can be found by looking at the “split view” of the motor and locating the item number. In this case it is number 110.

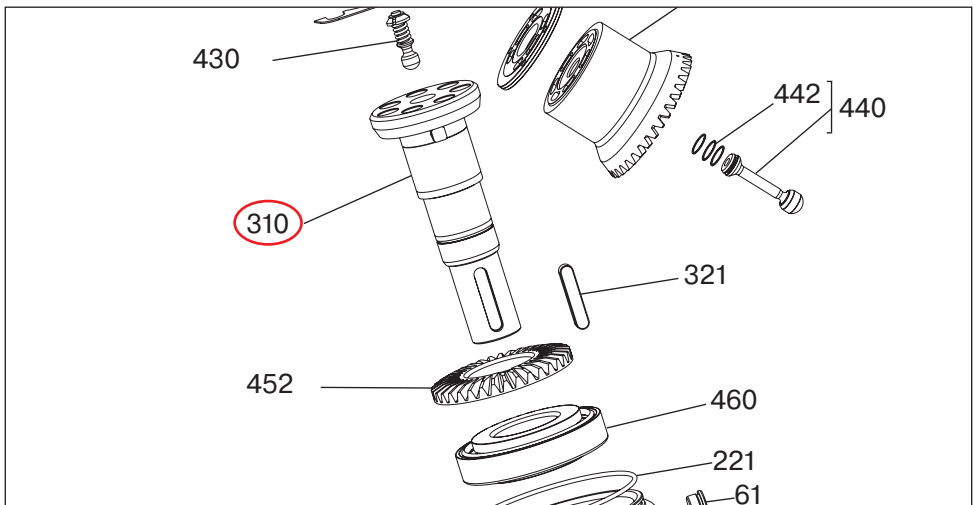


Pos	Part No	Description	Qty	Remarks
Housing parts				
61		Hex Socket Plug M12*1	1	VSTI12X1EDVITCF
110	3721864	Barrel Housing Assy Type F	1	
110	3721863	Barrel Housing Assy Type S	1	
130		Hex Socket Plug for S housing	1	8 HP50N-S
130		Hex Socket Plug for F housing	1	VSTI18X1,5EDVITCF

The other way is to know the name of the part, barrel housing assy (red type), and look at the parts listing for the description. The red S in the description matches our model number F12-030-MS-SV-T-000-0000-PO and has part number 3721863 (in green), quantity 1. Note that the Hex socket plug is not included, should be ordered from Parker Fitting division (in blue)

The shaft is the next item to be found. Looking for it visually in the “split view” we can determine that the shaft is item number 310.

We can refer to the parts list for the name of the part, shaft (red type), and look at the parts listing for the description.



Pos	Part No	Description	Qty	Remarks
310	3799644	Shaft type P	1	Require flat key
310	3799634	Shaft type S	1	
310	3799640	Shaft type T	1	Require flat key
321	3724437*	Flat Key for K and P shaft	1	

The blue T in the description matches our model number F12-030-MS-SV-T-000-0000-P0 and has part number 3799640 (in green), quantity 1.

In the remarks (orange text) we have a note that states “Require Flat Key”. We can offer that part to the customer, Flat keys must always be order with Minimum Order Quantity (MOQ)

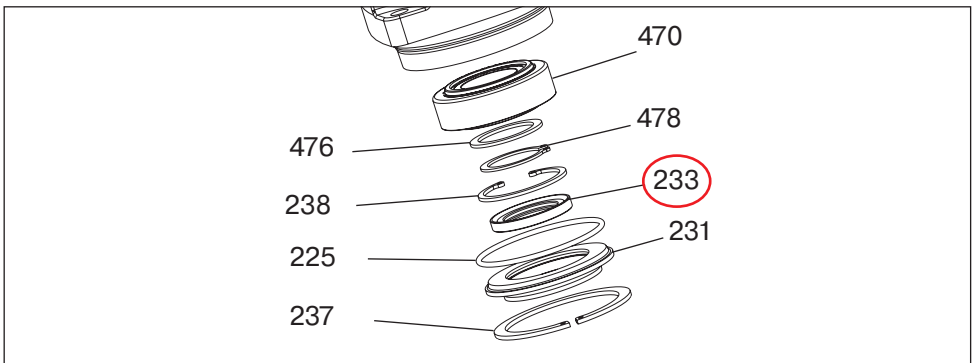
Pos	Part No	Description	Qty	Remarks
321	3724437*	Flat Key for K and P shaft	1	
321	3724449*	Flat Key for T shaft	1	

The blue T in the description matches our model number F12-030-MS-SV-T-000-0000-P0 and has part number 3724449 (in green), quantity 1.

The shaft seal is the next item to be found. Looking for it visually in the “split view” we can determine that the shaft is item number 233.

We can refer to the parts list for the name of the part, shaft seal item 233 (red circle), and look at the parts listing for the description.

Some parts are not sold as separate items and will only be available in kits.



		Seal kit contain: O-rings pos: 221, 225, 229 Shaft seal pos: 233 Retaining rings pos: 237, 238
		Repair spare part kit contain: Valve plate pos: 121 Cylinder Barrel pos: 411 Pistons pos: 440 (7 pcs) Hex Screws pos: 491 (4 pcs)
		Bearing spare part kit contain: Tap Rol Bearing pos: 460, 470 Spacer pos: 476 Retaining rings pos: 478
		Shim kit contain: Shims pos: 488 (1 pcs on each side)
	Seal kits 3793493 Sealing kit type V FPM 3785132 Sealing kit type N NBR 3784552 Sealing kit type S PTFE 3720898 Sealing kit type S SuperCut 100	
	Repair Spare part Kit 3721446 Type M (Motor) 3722010 Type S (High speed Motor) 3723977 Type L (CCW pump) 3723978 Type R (CW pump)	
	Bearing spare part kit 3723971 Bearing kit	
	Shim kit 3721330 Shims kit	
	*Kit contain 100 pcs, **Kit contain 20 pcs	

In the Kits section, we need to look at the right to determine which parts is required based on pos number. In this example we would like to get pos 233, shaft seal. Then it's only available in a seal kit and not sold as separate item. Some kits can be sold with MOQ.

We are looking for a shaft seal item 233, and there appears to be 2 seal kits to chose between. The model code calls out a V, F12-030-MS-SV-T-000-0000-P0, and it matches the seal kit with the V so our part number must be 3793493.

If your requested part is not listed in Spare part list, always consult with Parker Division

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

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Christian Jäger

General Manger

Pump & Motor Division Europe

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