

MF504 FIXED DISPLACEMENT PISTON MOTOR
SERVICE MANUAL

DISASSEMBLY

1. Clean outside of motor thoroughly.
2. Remove snap ring (1) from housing assembly.
3. Clamp shaft in a protected jaw vise with the motor housing up.
4. Remove the six capscrews (25) from backplate.
5. Using a plastic mallet, tap on the bolt hole lugs and rotate the housing either direction then tap on the underside of the lug to remove the backplate (24).
6. Remove O-ring (23) from backplate (24).
7. Remove the two thrust washers (21) and bearing (22) from backplate.
8. Remove connector plate (20), pistons (19), and spider (18) from motor.
9. Remove pilot (17), pivot (8), and spring (16) from motor.
10. Remove complete piston block and shaft assembly from motor for further disassembly.
11. Remove pistons (10) from piston block (11) and remove pivot (8) and spacer (9) from shaft. Remove piston block (11) and key (13) from shaft. It is not necessary to remove ring (15) from shaft.
12. Remove piston race assembly (7).
13. Remove bearing (6) and bearing race (5) from housing.
14. Remove shaft seal (2) from housing.

INSPECTION

1. Wash all parts thoroughly in a suitable solvent.
2. Examine needle bearing (3) in the housing (4) and backplate (24). If the needles are free of excessive play and remain in the bearing cage, there is no need to replace the bearing.
3. Inspect the bearing race (5), thrust bearing (6) and piston race assembly (7). All surfaces should be free of any signs of wear or fretting.
4. Inspect pilot (17) and pivot (8); conical surface should be free of wear and score marks.
5. Inspect the piston (10); the sides and radiused end should be smoother and free of surface fretting.
6. Inspect the piston block (11); the bores should be free of scoring. The keyway should be free of damage.

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INSPECTION (Cont'd)

7. Inspect the pistons (19); the O.D. surface should be smooth and flat and free of scoring and flaking.
8. Inspect the spider (18) for wear and damage.
9. Inspect the connector plate (20) for excessive scoring.
10. Inspect the flat surface on the backplate (24); it should be free of excessive scoring.
11. Inspect the thrust washers (21) and bearing (22); they should be free of fretting and cracks.
12. Inspect the shaft (14) for fretting in the bearing areas. Inspect keyway and key for wear.

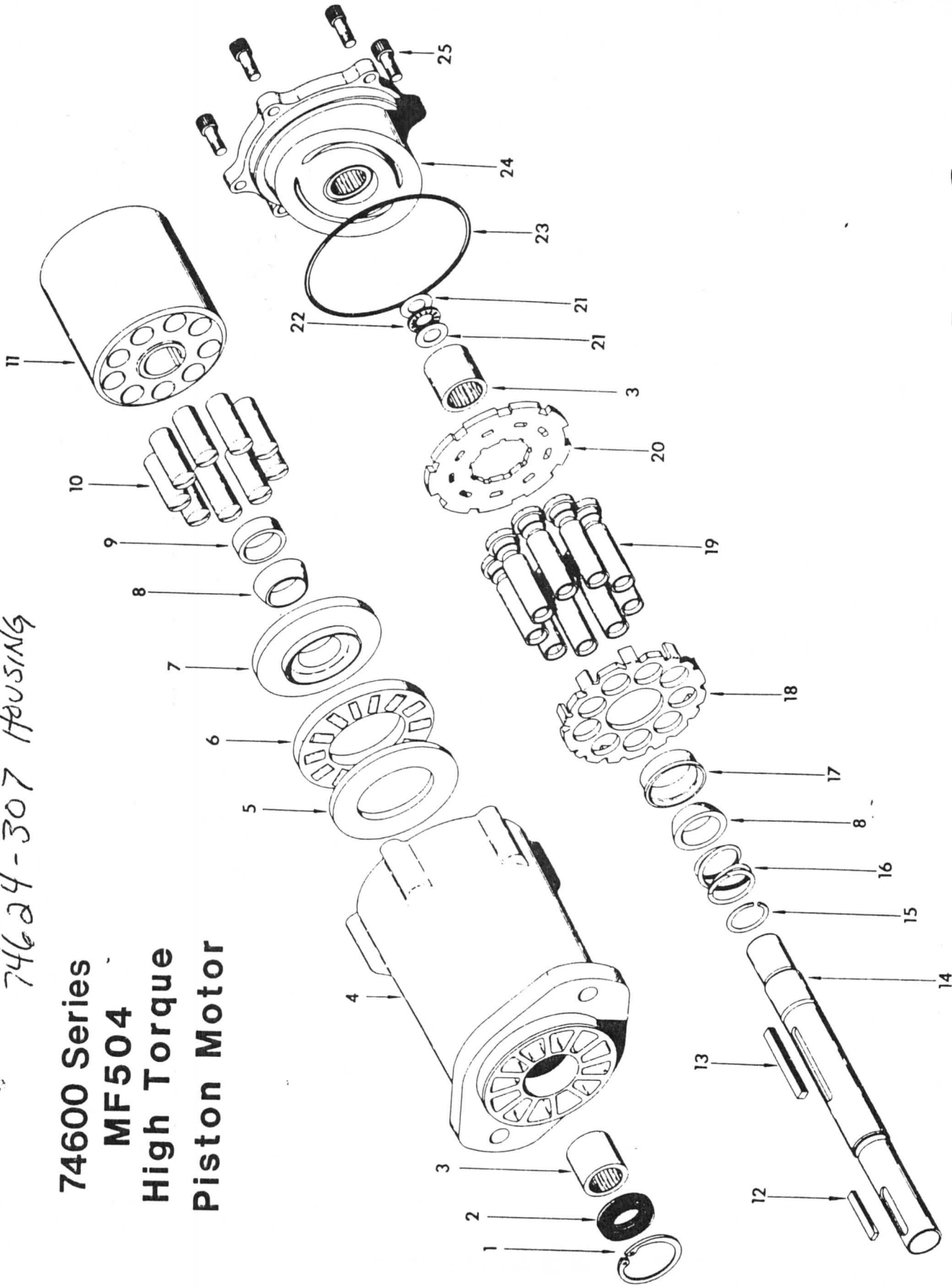
REASSEMBLY

1. Install snap ring (15) on shaft, then install key (13) in shaft.
2. Slide piston block (11) on shaft with 45° chamfer in I.D. towards the round snap ring on the shaft.
3. Lubricate the pistons (10) and install them in the bores next to the shaft drive end, pointed ends facing outward.
4. Slide spacer (9) and pivot (8) over shaft. Two pivots (8) are identical.
5. Set housing (4) with open end up, lubricate the bearing race (5) and install housing.
6. Slide piston race (7) and thrust bearing into shaft.
7. Lay housing on side and insert lubricated shaft and piston block assembly in housing. Be sure parts are properly aligned and seated.
8. Place the splined end of the shaft in a protected jawed vise with open end of housing up. Let shaft hang through housing to keep parts in position.
9. Place spring (16) over shaft. Lubricate and assemble pistons (19) in spider. Assemble pivot (8), pilot (17), and piston assemblies into piston block.
10. Lubricate shoes of pistons and lay flat part of connector plate (20) over pistons.
11. Install new O-ring (23) on backplate. Lay the two thrust washers (21) and bearing (22) on end of shaft. Install backplate and rotate backplate until all bolt holes are properly lined up. Insert bolts (25) and torque to 15-18 ft. lbs.
12. Remove assembly from vise and install new shaft seal (2) and snap ring (1).

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74624-307 HOUSING

**74600 Series
MF504
High Torque
Piston Motor**



Cessna

Spencer Fluid Power
5/86 2-4 SM

MFH

PARTS LIST

NEW

REF. NO.	PART NO.	DESCRIPTION	QTY PER UNIT MFH504
+ 1	39-0121	Snap Ring	1
+ 2	84-7128	Shaft Seal	1
3	33-0184	Needle Bearing	2
4	70-7324	Housing Assembly, Includes #3	1
5	33-0540	Bearing Race	1
6	33-0717	Thrust Bearing	1
7	74-7612	Piston Race Assembly	1
8	74-7910	Pivot	2
9	74-7769	Spacer	1
10A	74-7119	Piston, Solid Front	9
10B	74-7476	Piston Kit, Solid Front	1
11	74-7001	Piston Block	1
12	40-0397	Key	1
13	40-0737	Key	1
14A	71-7287	Shaft, 1" Keyed, 2.5" Long	1
14B	71-7089	Shaft, 1"-15T Splined With Snap Ring Groove, 1.81" Long	
14C	71-7111	Shaft, 7/8"-13T Splined, 1.81" Long	
15	39-0164	Retainer Ring	1
16	35-0464	Spring	1
17	74-7933	Pilot	1
18	74-7898	Spider	1
19A	74-7194	Piston with Slipper Shoe, Rear	9
19B	74-7409	Piston Kit, 9 Each	1
20	75-7175	Connector Plate	1
21A	33-0622	Thrust Race	*
21B	33-0837	Thrust Race	
22	33-0534	Thrust Bearing	1
+ 23	31-0296	O-ring, 3/32" X 4-1/2" I.D.	1
24	72-7284	Backplate Assembly, Includes #22	1
25	30-0869	Capscrew	6
--	83-7885	Seal Repair Kit	

+ Parts included in Seal Repair Kit

* Size and Quantity are based on unit requirements.

MF

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	QTY PER UNIT MF504
+ 1	39-0121	Snap Ring	1
+ 2	84-7128	Shaft Seal	1
3	33-0041	Needle Bearing	2
4	70-7601	Housing Assembly, Includes #3	1
5	33-0540	Bearing Race	1
6	33-0717	Thrust Bearing	1
7	74-7612	Piston Race Assembly	1
8	74-7910	Pivot	2
9	74-7769	Spacer	1
10A	74-7119	Piston, Solid Front	9
10B	74-7476	Piston Kit, Solid Front	1
11	74-7001	Piston Block	1
12	40-0397	Key	1
13	40-0737	Key	1
14A	71-7771	Shaft, 1" Keyed, 2.5" Long	1
14B	71-7624	Shaft, 1"-15T Splined With Snap Ring Groove, 1.81" Long	
14C	71-7310	Shaft, 7/8"-13T Splined, 1.81" Long	
15	39-0164	Retainer Ring	1
16	35-0464	Spring	1
17	74-7933	Pilot	1
18	74-7898	Spider	1
19A	74-7194	Piston with Slipper Shoe, Rear	9
19B	74-7409	Piston Kit, 9 Each	1
20	75-7175	Connector Plate	1
21	33-0622	Thrust Race	2
22	33-0534	Thrust Bearing	1
+ 23	31-0296	O-ring, 3/32" X 4-1/2" I.D.	1
24	72-7002	Backplate Assembly, Includes #22	1
25	30-0869	Capscrew	6
--	83-7885	Seal Repair Kit	

+ Parts included in Seal Repair Kit

MF504 MOTOR TROUBLE SHOOTING

In trouble shooting a pump-motor system, it is necessary to isolate the pump from the motor to determine which unit is actually malfunctioning. A worn pump or motor will both give the same system indication. Therefore, it is advisable to first run a pressure and flow check on the pump to make sure it is performing within its operating specifications. The following trouble shooting suggestions are based on the assumption that the pump has been flow and pressure checked and has been found within operating specifications.

<u>POSSIBLE TROUBLE</u>	<u>CAUSES</u>	<u>REMEDIES</u>
1. Motor turns while unloaded but slows down or stops when load is applied.	A. Scored backplate.	A. Remove backplate and examine face condition of flat area. If scored, replace backplate. <u>DO NOT LAP.</u>
	B. Scored connector plate.	B. Disassemble motor. Check finish on connector plate and backplate, replace if necessary.
	C. Scored or worn piston shoes.	C. Disassemble motor. Examine condition of shoes on pistons. Replace as a complete set if necessary.
	D. Low relief valve pressure.	D. Check relief valve for proper pressure setting. Adjust or replace relief valve.
2. Motor will not turn.	A. Severely scored backplate and connector plate.	A. Disassemble motor completely. Inspect, clean and replace all worn parts. Flush hydraulic system.
	B. Contaminate particle holding connector off backplate.	B. Disassemble motor. Inspect and clean parts. Replace parts as necessary.
3. Motor free wheels.	A. Oil flow and pressure shut off going to motor.	A. When the hydraulic system is shut off, either by shutting off the engine on a closed loop system or returning the control valve spool to neutral on an open center system, the motor will free wheel after it has leaked off and allows the free floating pistons to collapse. This is inherent in the design. On a closed loop or propulsion system, the motor will not free wheel as long as charge pressure is maintained to and from the motor.

MF504 MOTOR TROUBLE SHOOTING (Cont'd)

<u>POSSIBLE TROUBLE</u>	<u>CAUSES</u>	<u>REMEDIES</u>
4. Rapid tapping noise in motor.	A. Free floating pistons seating on bearing race.	A. When oil flow to the motor is shut off and the motor allowed to free wheel, the free floating pistons will collapse into the piston block. When oil flow is reapplied to the motor the pistons will reseat themselves against the bearing race and will cause a rapid tapping sound. This is not harmful to the motor as long as the oil flow into the motor does not exceed 10 GPM for the first revolution of the motor.
5. Excessive case drain flow.	A. Excessive internal wear in motor.	A. Disassemble motor. Inspect parts and replace as necessary. Case drain flow should not exceed 1.5 GPM at full pressure.

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