



HY13-1508-M1/USA

## **Parker Motors**

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### **110A Series Low Speed High Torque Hydraulic Wheel Motor Service Bulletin**

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### **WARNING**

**FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.**

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Introduction

The 110A series Low Speed High Torque (LSHT) hydraulic orbit wheel motor is designed to provide long life while operating with medium radial loads. Refer to catalog radial load limits. However, should maintenance be required, the instructions below should be used for disassembly, replacement of parts, cleaning and assembly.

Important Notes:

Prior to any motor disassembly, plug the open ports and case drain. Clean all dirt from the outside of the motor.

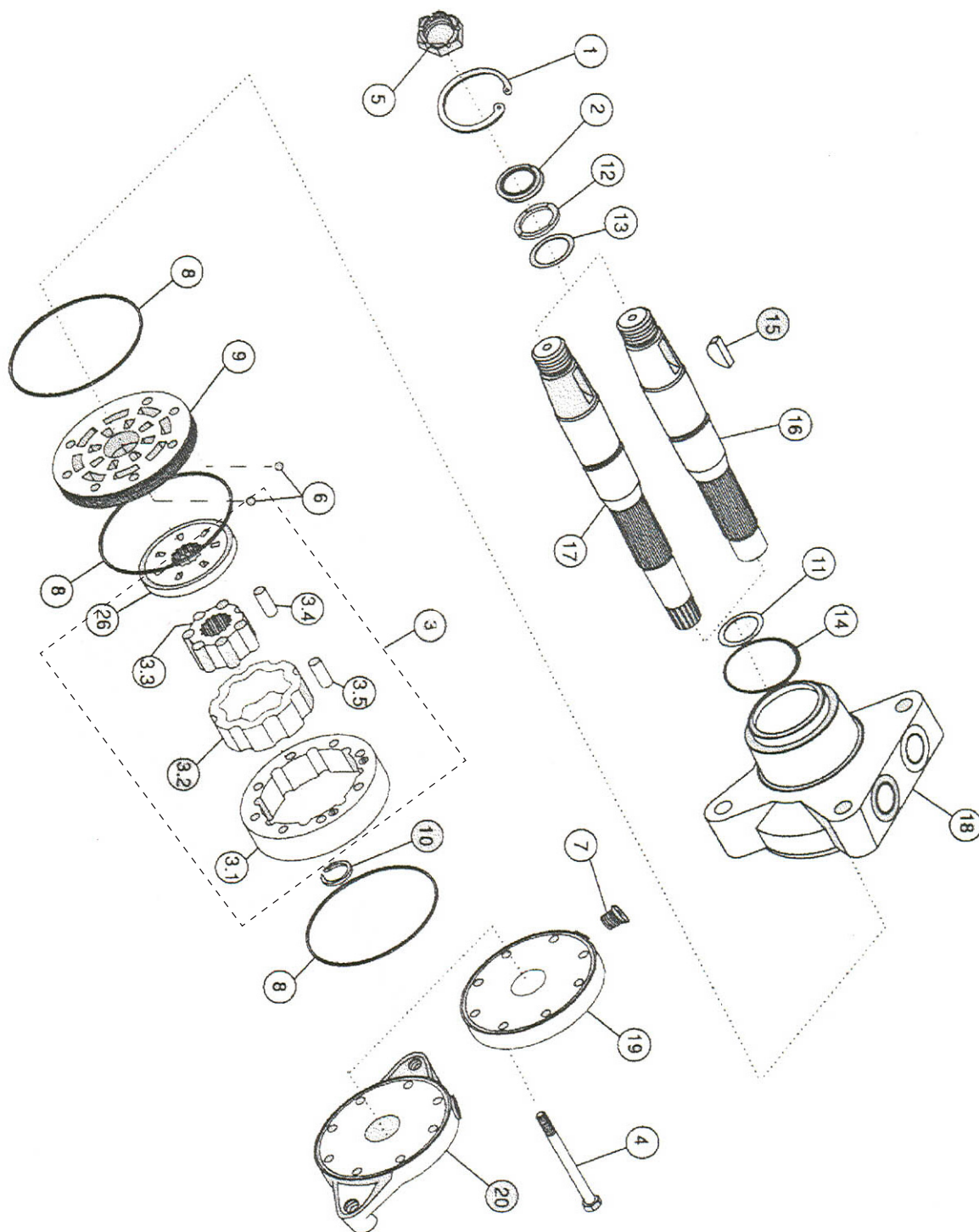
Prior to assembly lightly oil all seals, the rollers and the threaded bolt ends.

**Parts List**

<i>Item No.</i>	<i>Description</i>	<i>Qty./per Motor</i>	<i>Part Number</i>	<i>Motor Model</i>
1	Snap Ring, Seal 1.25"	1	1068	ALL MODELS
6	Check Valve, 1/4" Ball RC 58 min.	2	1021	ALL MODELS
8	Square Ring Seal	3	1046	ALL MODELS
4	Bolt Hex 5/16-24	8	021306	11XA-088-XX-X
	Bolt Hex 5/16-24	8	021382	11XA-106-XX-X
	Bolt Hex 5/16-24	8	021437	11XA-129-XX-X
	Bolt Hex 5/16-24	8	021438	11XA-164-XX-X
	Bolt Hex 5/16-24	8	021435	11XA-189-XX-X
	Bolt Hex 5/16-24	8	021439	11XA-241-XX-X
11	Washer, Thrust 1.25"	1	1065	ALL MODELS
12	Washer, Thrust DU	1	2270	ALL MODELS
13	Washer, Thrust Hardened	1	2271	ALL MODELS
14	O-Ring Seal	1	1060-33	ALL MODELS
10	Snap Ring .875"	1	1296	ALL MODELS
3	IGR Assy 8.8 cu.in/rev <sup>3</sup>	1	SM008807003A1	11XA-088-XS-X
	IGR Assy 10.6 cu.in/rev <sup>3</sup>	1	SM010607003A1	11XA-106-XS-X
	IGR Assy 12.9 cu.in/rev <sup>3</sup>	1	SM012907003A1	11XA-129-XS-X
	IGR Assy 16.4 cu.in/rev <sup>3</sup>	1	SM016407003A1	11XA-164-XS-X
	IGR Assy 18.9 cu.in/rev <sup>3</sup>	1	SM018907003A1	11XA-189-XS-X
	IGR Assy 21.4 cu.in/rev <sup>3</sup>	1	SM024107003A1	11XA-241-XS-X
15	Key, Woodruff	1	1756	114A-XXX-XS-X
	Key, Straight 1.25"	1	1020-3	113A-XXX-XS-X
5	Nut, Slotted 1-20	1	025113	114A-XXX-XS-X
16	Shaft 1.25" Straight Key	1	2500-X	113A-XXX-XS-0
	Shaft 1.25" J501 Taper	1	2499-X	114A-XXX-XS-0
17	Shaft 1.25" Straight Key Thru <sup>4</sup>	1	2668-XXX	113A-XXX-XS-1
	Shaft 1.25" J501 Taper Thru <sup>4</sup>	1	2542-XXX	114A-XXX-XS-1
18	Body 4 Bolt Thru Mounting (H)	1	PA-1952-1	11XA-XXX-HS-X
	Body 4 Bolt w/Tapped Holes (J)	1	PA-1952-2	11XA-XXX-JS-X
	Body 4 Bolt Thru Mounting (G)	1	PA-2527-1	11XA-XXX-GS-X
19	Cover/Bearing Assy	1	M110C-1	11XA-XXX-XS-O
20	Cover/Bearing Assy Thru <sup>4</sup>	1	M110C-2	11XA-XXX-XS-1
7	Plug, Vent w/O-Ring 7/16-20	1	036297	ALL MODELS
9	Commutator Plate	1	SM015995	ALL MODELS
2	Seal/Retainer Assy	1	SK000218	ALL MODELS
	Seal Kit, Complete	1	SK000187	ALL MODELS

**NOTES:**

1. Body assemblies and cover bearing assemblies include bearing and seal components where required.
2. Before ordering parts listed above confirm that all options in the model number match the identification tag on the motor. The "X" in a model number indicates an option.
3. Valve plate (26) is part of the IGR™ Assembly and not available separately.
4. Indicates parts used only in thru-shaft motors.



## Disassembly & Assembly Procedures

### Section I

#### Motor Disassembly

1. Remove the key (15) and Castle Nut (5) from the shaft if either is on the shaft.
2. Mount the motor in a vice or other holding device with the shaft facing down.
3. Using a 1/2" socket, remove the eight 5/16-24 bolts (4).
4. Remove the cover/bearing assembly (19 or 20) and the square ring (8). Discard the square ring.
5. Remove the locating ring (3.1) and eight rollers (3.5). See Fig. 1
6. Remove the two check balls (6). NOTE: The check balls frequently fall into the bolt holes disassembly. Be sure that the check balls are removed and accounted for.
7. Next, remove the outer rotor (3.2) and the seven seating rolls (3.4). See Fig. 1.
8. The inner rotor (3.3) of the IGR™ set and rotary valve (26) are retained on the shaft by snap ring (10). Remove this snap ring with snap ring pliers. DO NOT DISCARD. This snap ring will be reinstalled later.
9. Lift the inner rotor (3.3), rotary valve (26) and commutator plate (9) off the shaft and body bearing assembly.
10. The body bearing assembly (18) with shaft may now be removed from the holding device, after removing and discarding the square ring (8).
11. Place the body bearing assembly (18) on a clean, soft surface with the output end of the shaft facing up, if possible. Clean the front end of the body bearing assembly to avoid contaminating the lube system during the following steps.
12. Remove the snap ring (1) using snap ring pliers. For 1-1/4" straight keyed shaft model, remove outer snap ring first.
13. Pull the shaft (16 or 17) out vertically through the front of body bearing assembly (18). Removing

the shaft in this manner will also remove the seal retainer, thrust washer (13) and thrust washer DU (12).

14. With the seal retainer assembly (2) and shaft (16 or 17) removed, use a small screwdriver to dislodge the O-Ring (14) from its groove in the body bore.
15. Thrust washer (11) can be removed by hand. It will be laying on the shaft bearing in the body bearing assembly (18).
16. Remove all parts from the shaft. Inspect the shaft and all parts of the seal retainer assembly (2) and all components of the thrust system (11, 12, 13). Replace any worn or damaged parts. Always replace the seal retainer assembly (2). The shaft should have smooth, polished surfaces in the bearing and seal areas. If the shaft is lightly scratched in these areas, polish with fine emery paper in a circumferential direction. However, if the shaft has pitting or deep scratches, the entire motor should be inspected for scratches, galling and contamination. Replacement of parts may be required.

### Section II

#### Motor Assembly

1. Prior to assembly, all parts must be cleaned with a suitable solvent and be free of nicks and burrs.
2. Mount the body bearing assembly (18) with the pilot and bearing facing up, in holding device.
3. Place the thrust washer (11) on the shaft bearing in the body bearing assembly (18).
4. Place the lightly oiled O-Ring (14) into the innermost groove in the body bore.
5. Lower the spline end of the shaft (16 or 17) into the body bearing assembly.
6. Place the hardened thrust washer (13) on the shaft. Next slide DU thrust washer (12) on the shaft, copper and grooved side up.
7. Gently slide the oiled seal retainer assembly (2) over the shaft, chamfered side first, and **press**

into the body bore. When fully in place, the body snap ring groove will be visible.

8. Install the snap ring (1) into its body groove with the snap ring's sharp edges facing outward in the retainer pin between the snap ring lugs. Be sure the snap ring is completely seated in the groove. For 1-1/4" straight keyed shaft model, replace shaft snap ring.
9. Remount the body bearing assembly (18) with the pilot and shaft facing down in the holding device.
10. Inspect all components of the IGR™ assembly (3), if any of these are damaged the entire IGR™ assembly must be replaced.
11. Lightly oil the square ring seal (8) and place in the body groove.
12. Place the commutator plate (9) over the body, with the square ring groove facing up. Align the eight bolt holes in the plate with the eight bolt holes in the body. The holes will align in only one position. NOTE: Be sure to not dislodge the body square ring seal while positioning the commutator plate (9).
13. Place the rotary valve (26) on the shaft spline with the "T" shaped slots facing the body bearing assembly.
14. Next, place the IGR™ inner member on the shaft spline with the semi-circular roll pockets between the rotary valve ports. See Fig. 2.
15. Reinstall shaft snap ring (10) behind the IGR™ inner. (Removed Section I, Step 8).
16. Place the outer rotor member of the IGR™ over the inner and insert seven rolls into the inner pockets. The difference between rolls and rollers is distinguishable by eye. Rolls have square ends and rollers have domed ends.
17. Lightly oil the square ring seal (8) and place in the commutator plate (9) groove.
18. Place the check balls (6) over the two 1/8" diameter holes in the commutator plate. Be sure the check balls do not fall into the bolt holes.
19. Place the locating ring section (3.1) of the IGR™ (3) onto the commutator plate (9) with the check ball holes facing downward over the balls. Align the eight bolt holes in the location ring with the eight bolt holes in the body. The holes align in only one position. NOTE: Be sure to not dislodge the commutator plate square ring seal while positioning the locating ring.
20. Install the eight locating ring rollers (domed end - 3.5) into their pockets and lightly oil.
21. Place the other lightly oiled square ring seal (8) into the groove in the cover and place the cover over the shaft end. Align the bolt holes.
22. Install the eight bolts with lightly oiled thread ends into the bolt holes. Tighten diagonally to 15 ft. lb. Turn the shaft by hand several rotations.
  - A. In a diagonal pattern, increase the torque of each bolt by 5 ft. lb. Turn the shaft by hand several rotations.
  - B. Repeat step A until the torque of each bolt reaches 30 ft. lb.

## Section III

### Replacement of Front Seal

#### Assembly and/or Shaft

- A. Disassembly
  1. Remove the key (15) and Castle nut (5) from the shaft if either are on the shaft.
  2. Mount the motor in a vice or other holding device with the shaft facing down.
  3. With a 1/2" socket, remove the eight 5/16-24 bolts (4). If there are washers under the bolts, remove and discard.
  4. Remove the cover/bearing assembly (19 or 20) and the square ring (8).
  5. Remove snap ring (10) using snap ring pliers. DO NOT DISCARD. This snap ring will be reinstalled later.
  6. Remove square ring (8) from cover/bearing



## Assembly & Installation Requirements

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assembly (19 or 20) and discard. Replace the cover on the motor and align the bolt holes. Install the eight bolts (4) into the bolt holes. **FINGER TIGHTEN ONLY.**

7. Remove the motor from the vice or holding device and place on a clean, flat surface with the shaft facing up.
8. Clean the front end of the motor to avoid contamination to the lube system during the procedure.
9. Remove the snap ring (1) using snap ring pliers. For 1-1/4" straight keyed shaft model, remove outer snap ring first.
10. Pull the shaft (16 or 17) out vertically through the front of body bearing assembly (18). Removing the shaft in this manner will also remove the seal retainer assembly, thrust washer (13) and thrust washer DU (12). **CAUTION:** When pulling out the shaft, do not rotate the shaft or move the motor as this will alter the internal timing.
11. With the seal retainer assembly (2) and shaft (16 or 17) removed, use a small screwdriver to dislodge the O-Ring (14) from its groove in the body bore.
12. Thrust washer (11) can be removed by hand. It will be laying on the shaft bearing in the body bearing assembly (18).
13. Remove all the parts from the shaft and inspect the various parts of the seal retainer assembly (2) shaft (16 or 17) and thrust assembly (11,12,13). Replace any worn or damaged parts. Always replace the seal retainer assembly (2). The shaft should have smooth polished surfaces in the bearing and seal areas. If the shaft is lightly scratched in those areas, polish with fine emery paper in a circumferential direction. However, if the shaft has pitting or deep scratches, the entire motor should be disassembled for inspection according to Section I.

### B. Assembly

1. Prior to assembly, all parts must be cleaned with a suitable solvent and free of nicks and burrs.
2. Mount the body bearing assembly (18) with the pilot and bearing facing up, in a vise or other holding device.
3. Place the thrust washer (11) on the shaft bearing in the body bearing assembly (18).
4. Place the lightly oiled O-Ring (14) into the groove in the body core.
5. Slowly lower the spline end of the shaft assembly (16 or 17) into the motor body using caution not to rotate the internal parts once the shaft spline starts to engage.
6. Place the hardened thrust washer (13) on the shaft. Next, slide the DU thrust washer (12) on the shaft, copper and grooved side up.
7. Gently slide the oiled seal retainer assembly (2) over the shaft, chamfered side first, and press into the body bore. When fully in place, the body snap ring groove will be visible.
8. Install the snap ring (1) into its body groove with the snap ring's sharp edges facing outward and the retainer pin between the snap ring lugs. Be sure the snap ring is completely seated in the groove. For 1-1/4" straight keyed shaft model, you will replace the snap ring.
9. Remount the motor in the other holding device with the shaft facing down.
10. Remove the eight 5/16-24 bolts (4) that you finger tightened previously in Section II, A, Step 6.
11. Remove the cover/bearing assembly (19 or 20).
12. Install snap ring (10) onto the shaft in the snap ring groove directly behind IGR™ assembly.
13. Place the lightly oiled square ring (8) into the cover groove. Place the cover over the shaft end and align the bolt holes. **NOTE:** Do not dislodge the square ring while installing the cover.



14. Install the eight bolts with lightly oiled thread ends into the bolt holes. Tighten diagonally to 15 ft. lb. Turn the shaft by hand through several revolutions.

A. In a diagonal pattern, increase the torque of each bolt by 5 ft. lb. Turn the shaft by hand through several revolutions.

B. Repeat step A until the torque of each bolt has reached 30 ft. lb.

## **Section IV**

### **Thru Cover Shaft Seal Replacement**

The Thru-Shaft high pressure seal and dust seal are not replaceable items. In the unlikely event of a seal failure, the entire thru cover must be replaced.

## **Section V**

### **Installation Requirements**

1. The motor may be mounted in any secure position.
2. If the system minimum downstream pressure exceeds 1000 PSI on a continuous basis, the external case drain (7) should be vented to tank.
3. The standard motor seals are suitable for use with petroleum based oils. Consult the factory for use with other fluids.
4. A minimum of 25 micro filtration with a B ratio of 2 is recommended.
5. For system pressure, please refer to the catalog.
6. Shaft may not turn freely after assembly. A short running period may be required.
7. On tapered shafts, torque castle nut to 80-90 ft. lb., then continue tightening nut until the cotter pin slot lines up with the shaft crosshole.

## Date Coding & Detail Figures

### Section VI

#### Date Coding

Prior to December 31, 1988 the serial number stamped into the identification tag provided the month and year of manufacture and a sequentially assigned number.

Sample serial number: **H6 - 1234**

**H** = The month of manufacture

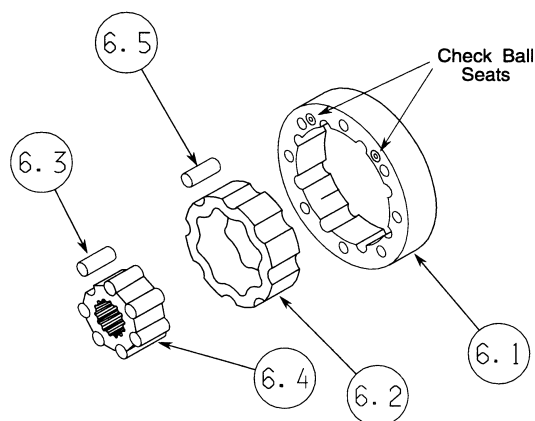
**6** = The year of manufacture (this the last digit of the year number i.e. 1986)

Month code:

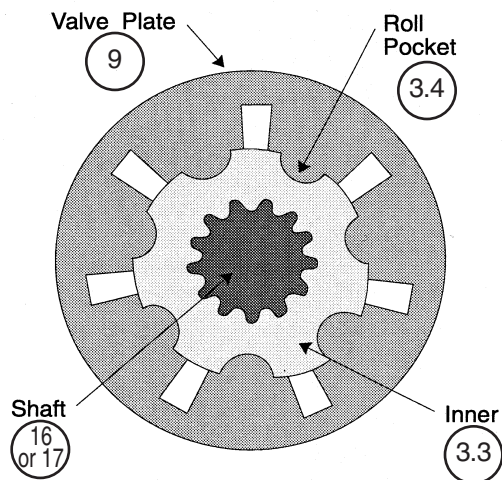
A = January	E = May	J = September
B = February	F = June	K = October
C = March	G = July	L = November
D = April	H = August	M = December

Motors manufactured after January 1, 1989, have the Julian Date Code and year of manufacture stamped into the identification tag. i.e. **025-90**. The three digits indicate the day of the year the motor was manufactured. The last two digits indicate the year of manufacture.

The example (025-90) was manufactured during the 25<sup>th</sup> day of 1990.



**Fig. 1**  
Exploded IGR™



**Fig. 2**  
Correct Valve Plate / Inner Orientation  
(Not to Scale)



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