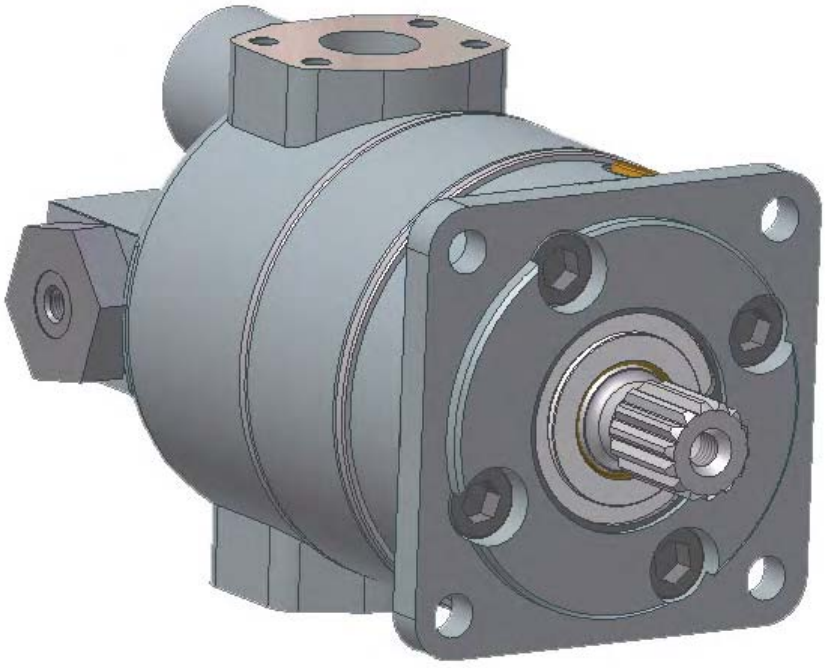
Repair Manual

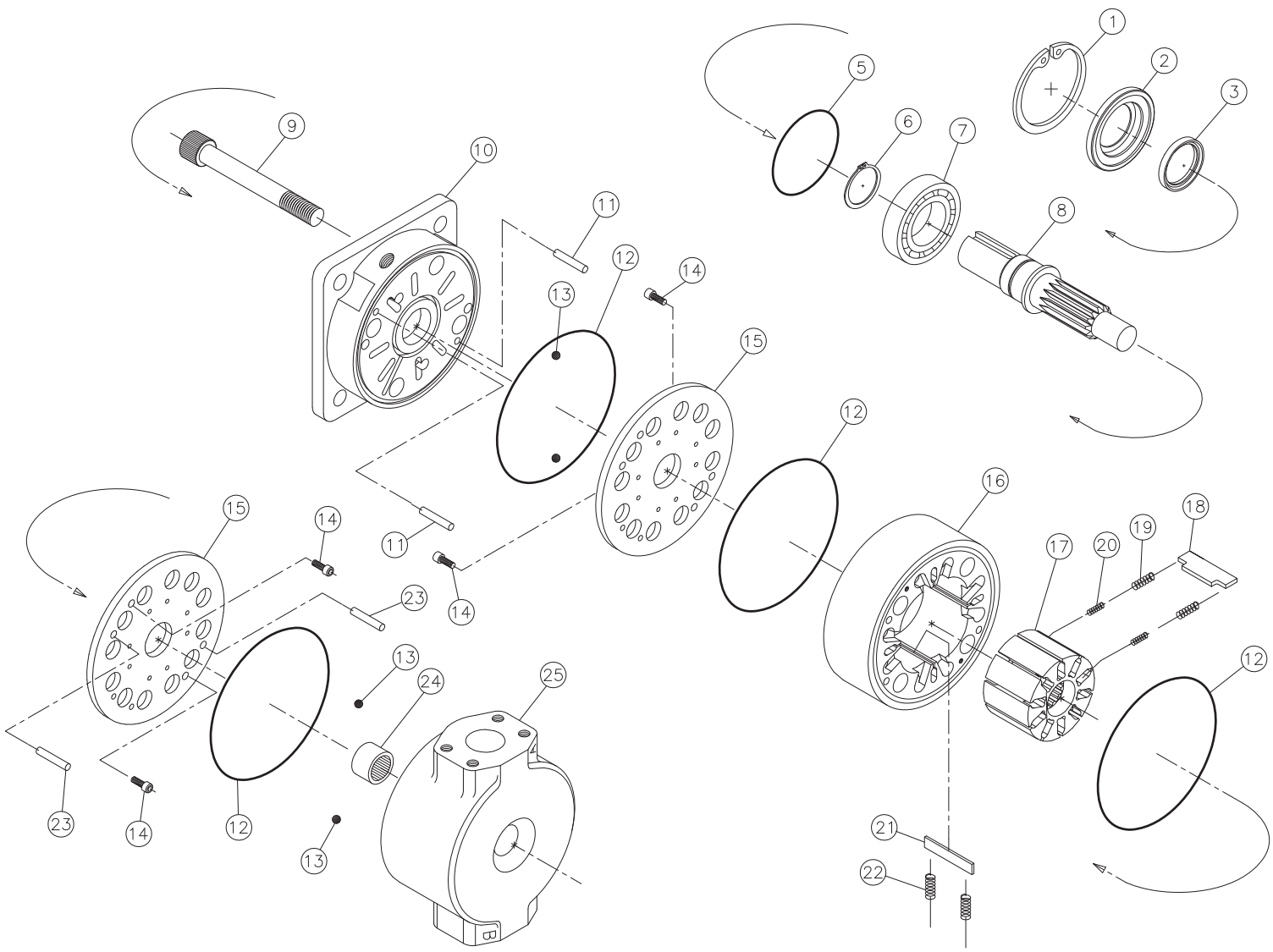
15 Series

Standard Motor

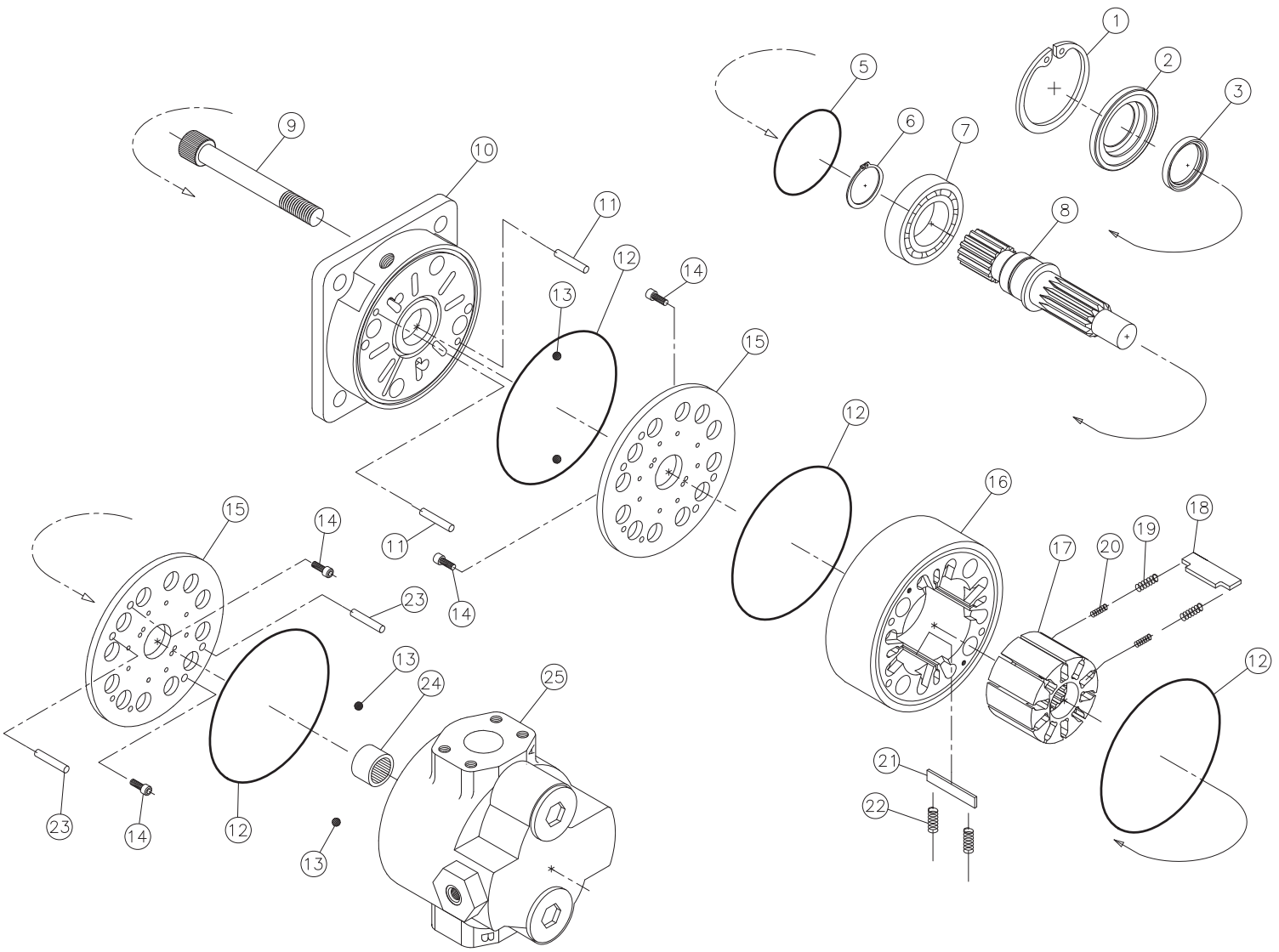


Two Speed Motor

Rexroth
Bosch Group



SERIES 15 STD. MOTOR EXP. VIEW			
ITEM	PART NO.	DESCRIPTION	QTY
1	0150111	SEAL PLATE SNAP RING	1
2	0150135	SEAL PLATE	1
3	0150161	SEAL, SHAFT, TCN	1
4		NOT USED	
5	0150114	SEAL PLATE O–RING	1
6	0150730	SNAP RING, BEARING	1
7	0150710	BALL BEARING	1
8	0150701	SHAFT, KEYED	1
	0150702	SHAFT, SPLINED	1
9	0150901	BOLT	4
10	0150102	FRONT HOUSING–INTERNAL	1
11	0150428	DOWEL PINS – FRONT	2
12	0150610	O–RING	4
13	0150902	BALL CHECKS	4
14	0150620	PLATE SCREW	4
15	0150608	PLATE	2
16	0150400	STATOR GA 11.5	1
	0150401	STATOR GA 15	1
	0150402	STATOR GA 13	1
	0150403	STATOR GA 9.5	1
	0150404	STATOR GA 8.0	1
	0150406	STATOR GA 7.0	1
	0150407	STATOR GA 6	1
	0150409	STATOR GA 3.0	1
17	0150300	ROTOR	1
18	0150313	ROTOR VANE	10
19	0150320	ROTOR VANE SPRING OUTER	20
20	0150321	ROTOR VANE SPRING INNER	20
21	0150410	STATOR VANE	4
22	0150420	STATOR VANE SPRING	8
23	0150429	DOWEL PINS – REAR	2
24	0150720	NEEDLE BEARING	1
25	0150800	REAR HOUSING	1



SERIES 15 STD. TWO SPEED EXP. VIEW			
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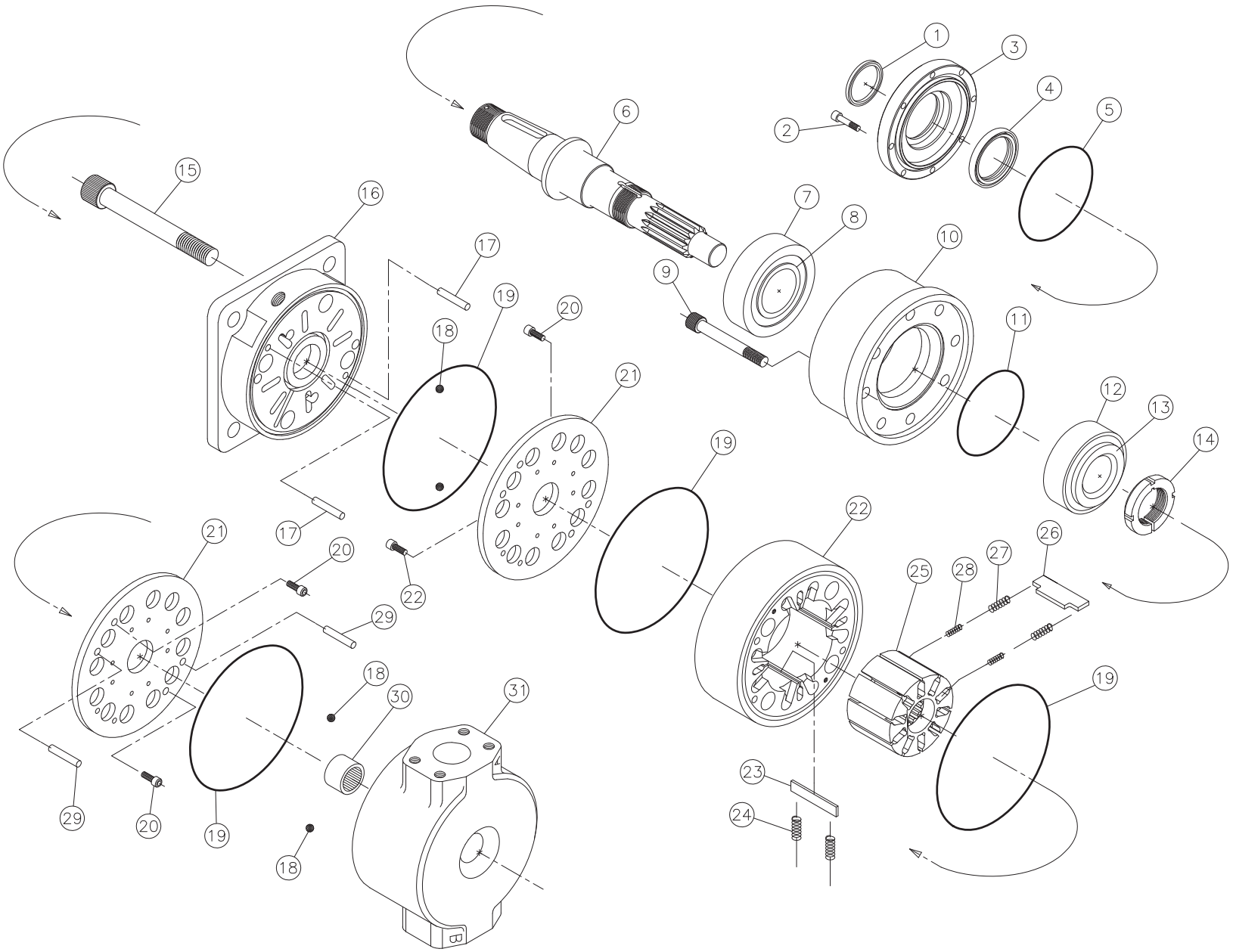
1	0150111	SEAL PLATE SNAP RING	1
2	0150135	SEAL PLATE	1
3	0150161	SEAL, SHAFT, TCN	1
4		NOT USED	
5	0150114	SEAL PLATE O–RING	1
6	0150730	SNAP RING, BEARING	1
7	0150710	BALL BEARING	1
	0150701	SHAFT, KEYED	1
8	0150702	SHAFT, SPLINED	1
9	0150901	BOLT	4
10	0150102	FRONT HOUSING–INTERNAL	1
11	0150428	DOWEL PINS – FRONT	2
12	0150610	O–RING	4
13	0150902	BALL CHECKS	4
14	0150620	PLATE SCREWS	4
15	0150609	PLATE, TWO SPEED	2
16	0150401	STATOR, GA 15	1
	0150402	STATOR, GA 13	1
	0150403	STATOR, 9.5	1
	0150404	STATOR, 8.0	1
	0150407	STATOR, GA 6.0	1
	0150408	STATOR, GA 10.5–2S	1
	0150414	STATOR, GA 11.5–2S	1
	0150419	STATOR, GA 5.0	1
17	0150300	ROTOR	1
18	0150313	ROTOR VANE	10
19	0150320	ROTOR VANE SPRING OUTER	20
20	0150321	ROTOR VANE SPRING INNER	20
21	0150410	STATOR VANE	4
22	0150420	STATOR VANE SPRING	8
23	0150429	DOWEL PINS – REAR	2
24	0150720	NEEDLE BEARING	1
25	KT–HO–0151813C	REAR HOUSING, TS, #62	1
	KT–HO–0151814C	REAR HOUSING, TS, #63	1
	KT–HO–0151815C	REAR HOUSING, TS, #65	1



SERIES 15 WHEEL MOTOR EXP VIEW			
ITEM	PART NO.	DESCRIPTION	QTY
1	0150122	SEAL, DUST SEAL, WM	1
2	0150109	BOLT, WM SEAL PLATE	8
3	0150153	SEAL PLATE, WM, CR	1
4	0150152	SEAL, WM, CR, 1-5/8	1
5	0150107	O-RING, SEAL PLATE, WM	1
6	0150707	SHAFT, WHEEL MOTOR	1
7	0150705	CUP, WM LARGE	1
8	0150708	CONE, WM, LARGE	1
9	0150108	BOLT, WM BEARING HOUSING	8
10	0150104	BEARING HOUSING, WM	1
11	0150106	O-RING, BEARING HOUSING	1
12	0150709	CUP, WM SMALL	1
13	0150711	CONE, WM, SMALL	1
14	0150741	CLAMPNUT	1
15	0150901	BOLT	4
16	0150100	FRONT HOUSING, WM	1
17	0150428	DOWEL PIN, FRONT	2
18	0150902	BALL CHECKS	4
19	0150610	O-RING, MAIN	4
20	0150620	PLATE SCREW	4
21	0150608	PLATE	2
22	0150400	STATOR GA 11.5	1
	0150401	STATOR GA 15	1
	0150402	STATOR GA 13	1
	0150403	STATOR GA 9.5	1
	0150404	STATOR GA 8.0	1
	0150406	STATOR GA 7.0	1
	0150407	STATOR GA 6	1
	0150409	STATOR GA 3.0	1
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24	0150420	STATOR VANE SPRING	8
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27	0150320	ROTOR VANE SPRING OUTER	20
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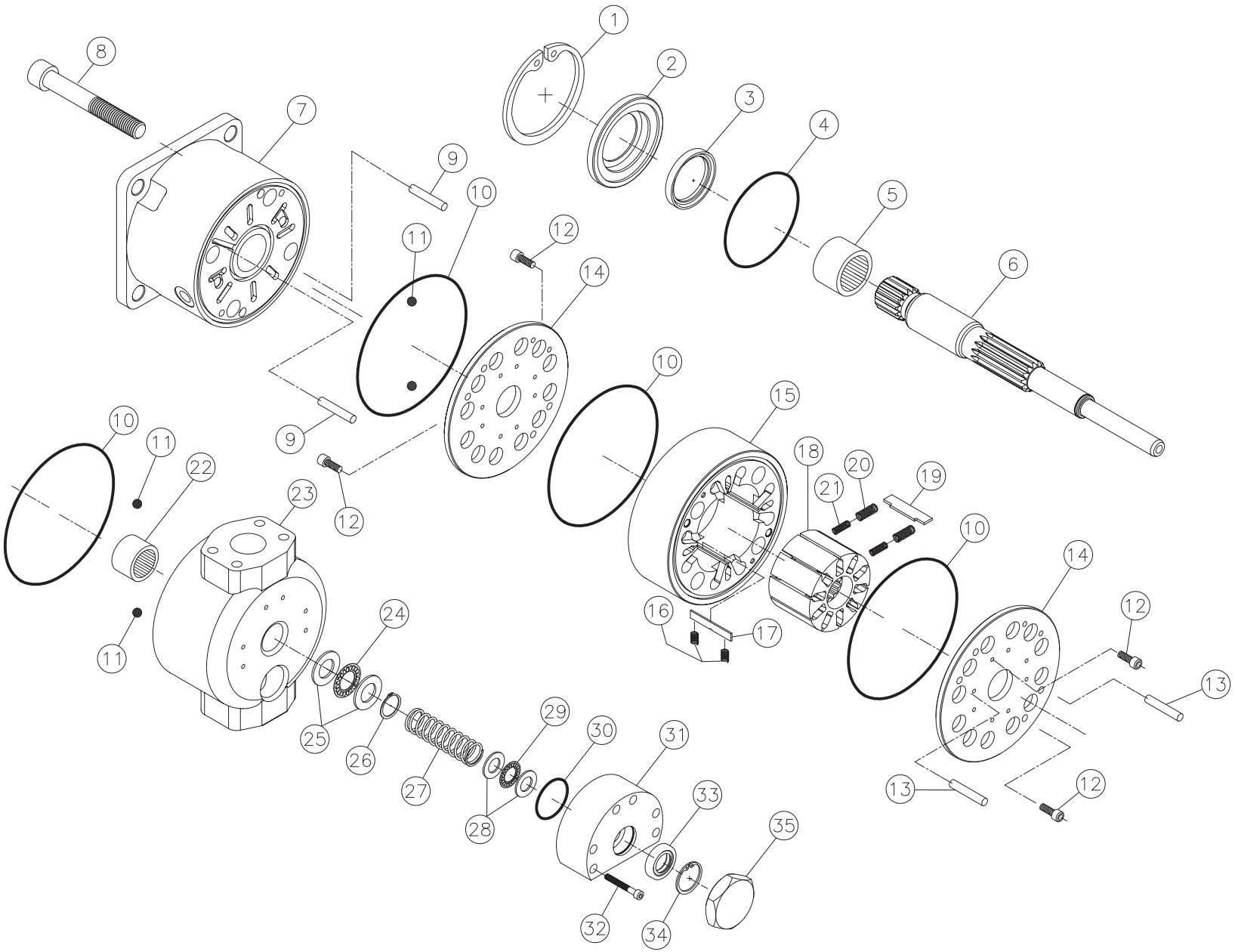
29	0150429	DOWEL PINS – REAR	2
30	0150720	NEEDLE BEARING	1
31	0150800	REAR HOUSING	1



SERIES 15 STD. MOTOR EXP. VIEW			
ITEM	PART NO.	DESCRIPTION	QTY
1	0150111	SEAL PLATE SNAP RING	1
2	0150135	SEAL PLATE	1
3	0150161	SEAL, SHAFT, TCN	1
4	0150114	SEAL PLATE O-RING	1
5	0150765	NEEDLE BEARING, RETRACTABLE	1
6	0150759	SHAFT, SPLINED, RETRACTABLE	1
7	0150168	FRONT HOUSING, RETRACTABLE	1
8	0150931	BOLT, MAIN	4
9	0150428	DOWEL PINS – FRONT	2
10	0150610	O-RING	4
11	0150902	BALL CHECKS	4
12	0150620	PLATE SCREW	4
13	0150429	DOWEL PINS – REAR	2
14	0150608	PLATE	2
15	0150400	STATOR GA 11.5	1
	0150401	STATOR GA 15	1
	0150402	STATOR GA 13	1
	0150403	STATOR GA 9.5	1
	0150404	STATOR GA 8.0	1
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16	0150420	STATOR VANE SPRING	8
17	0150410	STATOR VANE	4
18	0150300	ROTOR	1
19	0150313	ROTOR VANE	10
20	0150320	ROTOR VANE SPRING OUTER	20
21	0150321	ROTOR VANE SPRING INNER	20
22	0150720	NEEDLE BEARING	1
23	0150896	REAR HOUSING, RETRACTABLE	1
24	0150763	BEARING, THRUST LARGE	1
25	0150764	WASHER, THRUST LARGE	1
26	0150766	SNAP RING, RETRACTABLE	1
27	0150767	SPRING, RETRACTABLE	1
28	0150762	WASHER, THRUST SMALL	1
29	0150761	BEARING, THRUST SMALL	1
30	0150898	O-RING, SEAL PLT. RETRACT.	1
31	0150897	SEAL PLATE, RETRACTABLE	1
32	0151801	BOLT, RETRACT. RR SL. PLT.	6
33	0151800	SEAL, SHAFT RETRACTABLE RR	1
34	0150899	SNAP RING, SL. PLT., RETRACT.	1
35	0150760	KNOB, RETRACTABLE	1

WARNING: RINEER RECOMMENDS FOLLOWING **ALL** STANDARD SHOP SAFETY PRACTICES SPECIFICALLY INCLUDING WEARING OF EYE PROTECTION.

REMOVAL OF SHAFT SEAL

1

1) Remove snap ring

WARNING: Use caution when removing snap ring. If released accidentally it can become an airborne hazard.

2

1) Pry out shaft seal plate with two screw drivers.
2) Remove seal plate o-ring from groove in bearing bore.

REMOVAL OF WHEEL MOTOR SEAL PLATE AND BEARING BOX

3

1) Loosen and remove 8 each 10-32 bolts.
2) Pry off seal plate with screw driver.

4

Loosen and remove 8 each 3/8" bolts with 5/16" socket head wrench.

5

1) Two of the 3/8" bolt holes are provided with jack screw threads.
2) Insert a piece of 1/4" round stock by 2-1/2" long into each jack screw hole
3) Screw two 7/16-14 bolts into the jack screw threads until the bearing box is free of the motor.

6

Lift up on the bearing box to remove from motor.

DISASSEMBLY OF WHEEL MOTOR BEARING BOX

7

1) Loosen clamp screw in lock nut.
2) Unscrew lock nut and remove.

8

1) Press shaft out of bearing box.
2) Proceed to step 9, disregarding steps 11 & 12

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DISASSEMBLY OF FRONT HOUSING AND SHAFT

9

1) Mark one side of the motor for proper assembly, paying careful attention that the cartridge will not be installed upside down.
2) Secure the motor prior to loosening the 5/8-11 bolts.

10

1) Remove front housing
2) Note: Two 5/16" ball checks and one main body o-ring may be dislodged and fall free.

11

With the seal plate removed, press shaft and ball bearing out of front housing.

12

1) Remove snap ring from shaft.
2) Press shaft out of bearing.

DISASSEMBLY OF ROTOR/STATOR CARTRIDGE

13

Lift up rotor/stator cartridge and remove from the rear housing.

14

1) Place cartridge on any object which will hold it off the table.
2) Remove two each 10-32 place screws.
3) Remove timing plate.

15

1) Remove o-ring and springs with a small screwdriver.
2) Remove dowels pins.

16

1) Replace plate on rotor/stator cartridge.
2) Turn rotor/stator cartridge over.
3) Repeat steps 14 & 15.

17

1) Remove the rotor.
2) Remove both the rotor and stator vanes.
3) Note: On motors manufactured prior to 1987, rotor vane slots and rotor vanes should be numbered so that vanes can be reassembled in the same vane slot.

INSPECTION AND REPLACEMENT OF PARTS

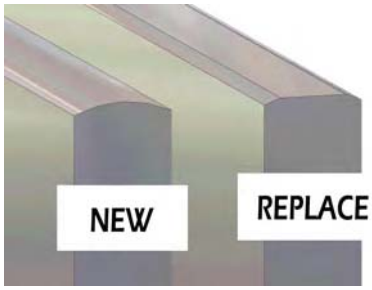
18

Inspect all springs and seals. We recommend replacement of all seals and springs whenever the motor has been disassembled.

19

Inspect all parts and replace any parts which obviously show excessive wear or damage.

20



VANES: Normal wear results in slight flattening of vane tips which does not impair motor performance. Replace vane if radius is reduced by 50%. Clearance between the rotor vane and rotor vane slot varies with the vane selection. The design allows the vane to "lean" slightly in the slot, providing the required mechanical seal.

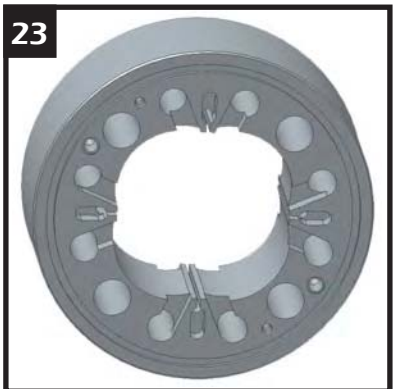
21

PLATES: Normal wear results in marking of timing plates which does not impair motor performance. Replacement of the timing plate is required if any smearing, galling, or heat cracks are present.

22

ROTOR: Normal wear results in polishing of rotor faces which does not impair motor performance. Examine the rotor vane slots closely. Polishing down in the slots is normal, but if there is any indication of a "pocket" forming in the wall of the slot, the rotor should be replaced.

23



STATOR: Normal wear results in polishing of cam form which does not impair motor performances. Noticeable wear may be apparent along the corner of one side of the staor vane slot. This does not necessarily require replacement of the stator, but may slightly affect volumetric efficiency.

24

Note: Measure the rotor and stator length to the fourth decimal point and supply measurement when ordering rotor, stator, or vanes.

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ASSEMBLY OF ROTOR/STATOR CARTRIDGE

25

1) Reverse the procedures in steps 17, 16, 15, and 14
2) NOTE: Make sure that the radiused edge of each stator vane points to the rotor and the radiused edge of each rotor vane points to the stator.
3) NOTE: Make sure springs are seated in the bottom of the spring pocket in both the rotor and stator.

ASSEMBLY OF FRONT HOUSING

26

1) Press bearing onto shaft.
2) Install snap ring.

27

Press shaft and bearing assembly into front housing by pressing on the outer race of bearing.

28

1) Place seal in seal plate.
2) Place seal plate o-ring into groove in the front housing.
3) Press seal plate into front housing.
4) Install snap ring.
5) Proceed to step 30.

ASSEMBLY OF WHEEL MOTOR FRONT HOUSING

29

1) Reverse the procedures in steps 8 thru 3.
2) Screw lock nut onto shaft until all threads are engaged.
3) Tighten clamp screw until lock nut turns with a slight drag.
4) Tighten lock nut until desired rolling drag of bearing is obtained - see procedure Page 9.
5) Tighten clamp screw
6) Tighten all seal plate bolts.

ASSEMBLY OF MOTOR

30

1) Install dowel pins into rear housing.
2) Install ballchecks into rear housings.
3) Install main body o-ring.

31

1) Place rotor/stator cartridge onto rear housing.
2) NOTE: Make sure assembly marks from step 3 are lined up.

32

1) Install main body o-ring into front housing.
2) Install ball checks into front housing.
3) Place a small amount of grease over ball checks and o-ring.
4) Wipe off excess grease.

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33

1) Install dowel pins into rotor/stator cartridge.
2) Pour a small amount of clean oil into the cartridge.
3) Install front housing onto rotor/stator cartridge.
4) Make sure alignment marks are lined up.

34

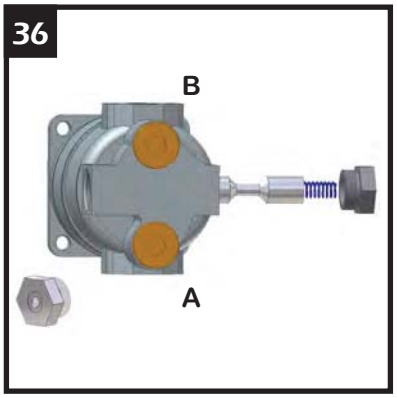
1) Install 5/8-11 bolts.
2) Torque bolts to 50 ft./lbs.

35

1) Rotate shaft in both directions to assure that the shaft turns smoothly.
2) Torque motor to 190 ft./lbs.
3) Rotate shaft again in both directions to assure that the shaft turns smoothly.

SPOOL ASSEMBLY FOR THE TWO SPEED MOTOR

36

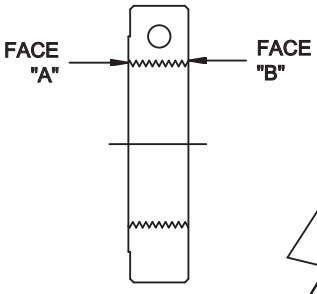


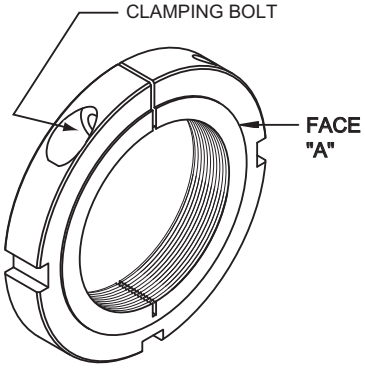
NOTE: Spool should be oriented as shown for two speed motors with model codes 62, 63, 68, & 69.

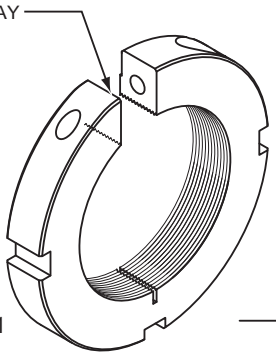
NOTE: Slight design variations may exist in motors manufactured either before or after the printing of this manual.

WHEEL MOTOR SHAFT AND BEARING ASSEMBLY PROCEDURE

1) Clean ALL assembly parts w/ lacquer thinner.
2) Dip clampnut and clamping bolt separately in lacquer thinner.
   (Steps 3 thru 10 must be conducted to completion ONE assembly at a time.)
3) Press bearing cups into bearing housing. Make sure they are pressed completely against bearing shoulders.
4) Coat inner race of large cone with #609 (green) Loctite and press cone onto the shaft. Make sure the cone is completely against the shoulder of the shaft.
5) Insert shaft and large cone into bearing housing.
6) Coat inner race of small cone with #609 (green) Loctite and press small cone onto shaft.
7) Apply #272 (red) Loctite to the clampnut threads of the shaft. Apply #242 (blue) Loctite to the threads of the clamping bolt and install in the clampnut.
8) Spin clampnut onto shaft with the "B" face towards bearings. After the nut threads are fully engaged, but prior to the nut contacting the bearings, tighten the clamping bolt until there is drag on the clamping nut (see note Fig. 1). Tighten the nut until a 20 to 30 inch pound rolling torque is achieved.
9) Tighten clamping bolt on clampnut to 70 inch pounds and recheck rolling torque. Apply inspectors lacquer to head of the bolt.
10) Allow a minimum of 24 hrs. to dry.

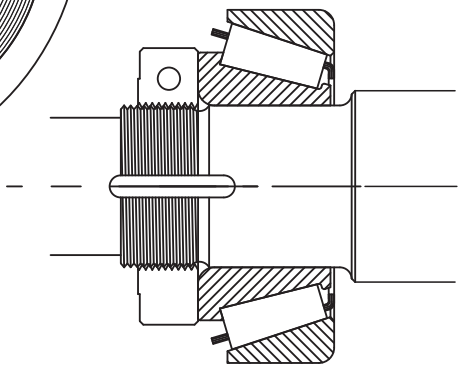






Note:
The slit in the clampnut allows for loose assembly on the shaft. Once in position, the clampnut clamping bolt MUST be tightened to a slight drag in order to correctly engage the threads on the shaft to achieve the clamp force required.

Figure 1



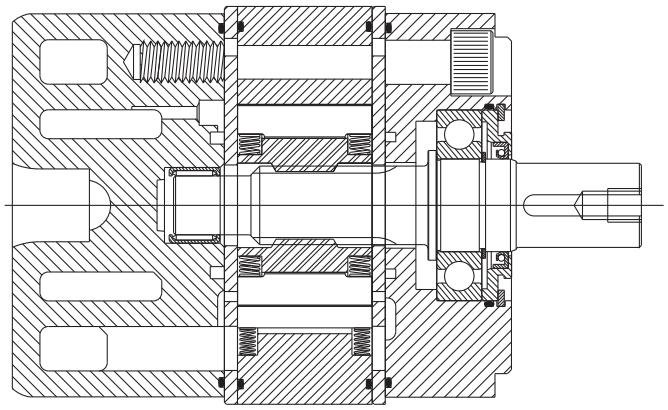
Information:

Bolt Torque -
- Main Bolts (5/8-11): 190 ft. lbs.
- Seal Plate (3/8-16)
- (Wheel Motor only): 45 ft. lbs.

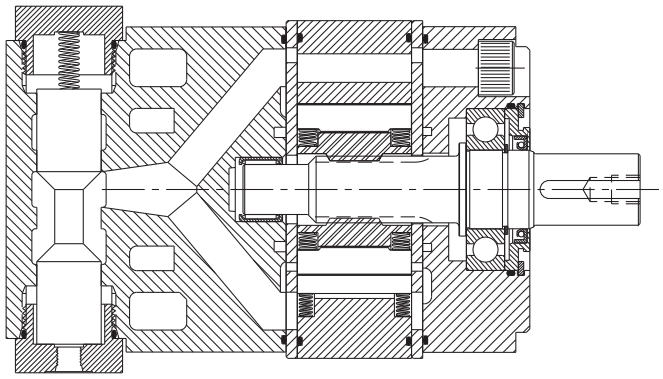
Grease used for bolt threads and o-ring retention:
- Pennzoil 707L RED

Shaft seal assembly lube:
- Mobilgrease special with Moly

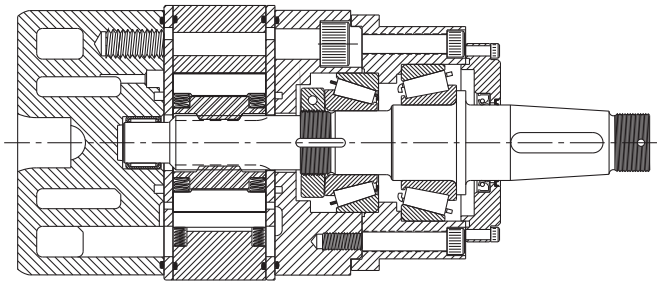
Seal Kits:
- Standard 15 series seal kit #0150940
- Standard 15 two speed seal kit #0150940
- Standard 15 wheel motor seal kit #0150936



STANDARD MOTOR



TWO SPEED MOTOR



WHEEL MOTOR