

Repair Manual

16 Series Roofbolter

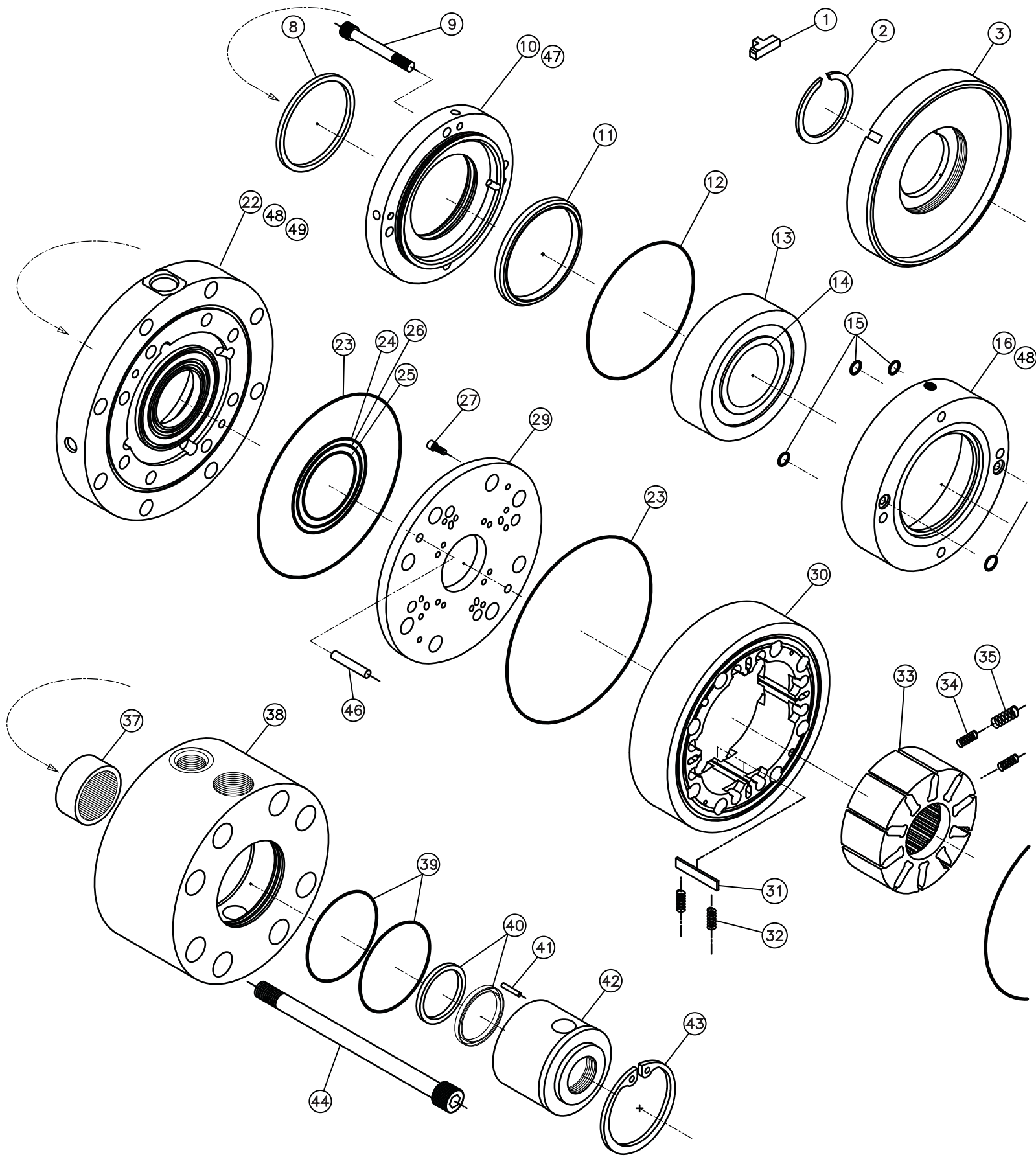


Vacuum Dust Suppression (-14 Model)

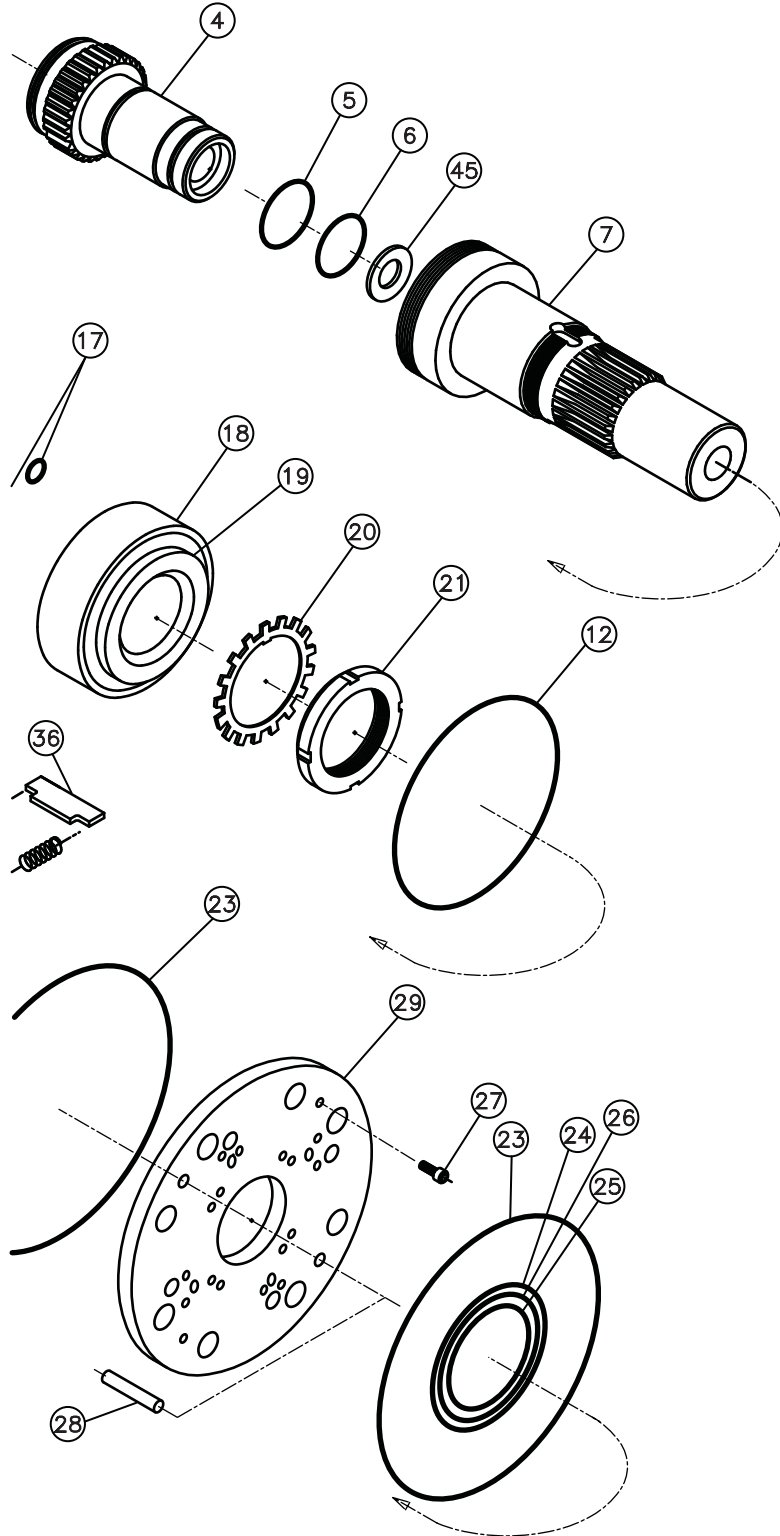
Water/Vacuum (-18 Model)

Water/Vacuum Rear Mount (-19 Model)





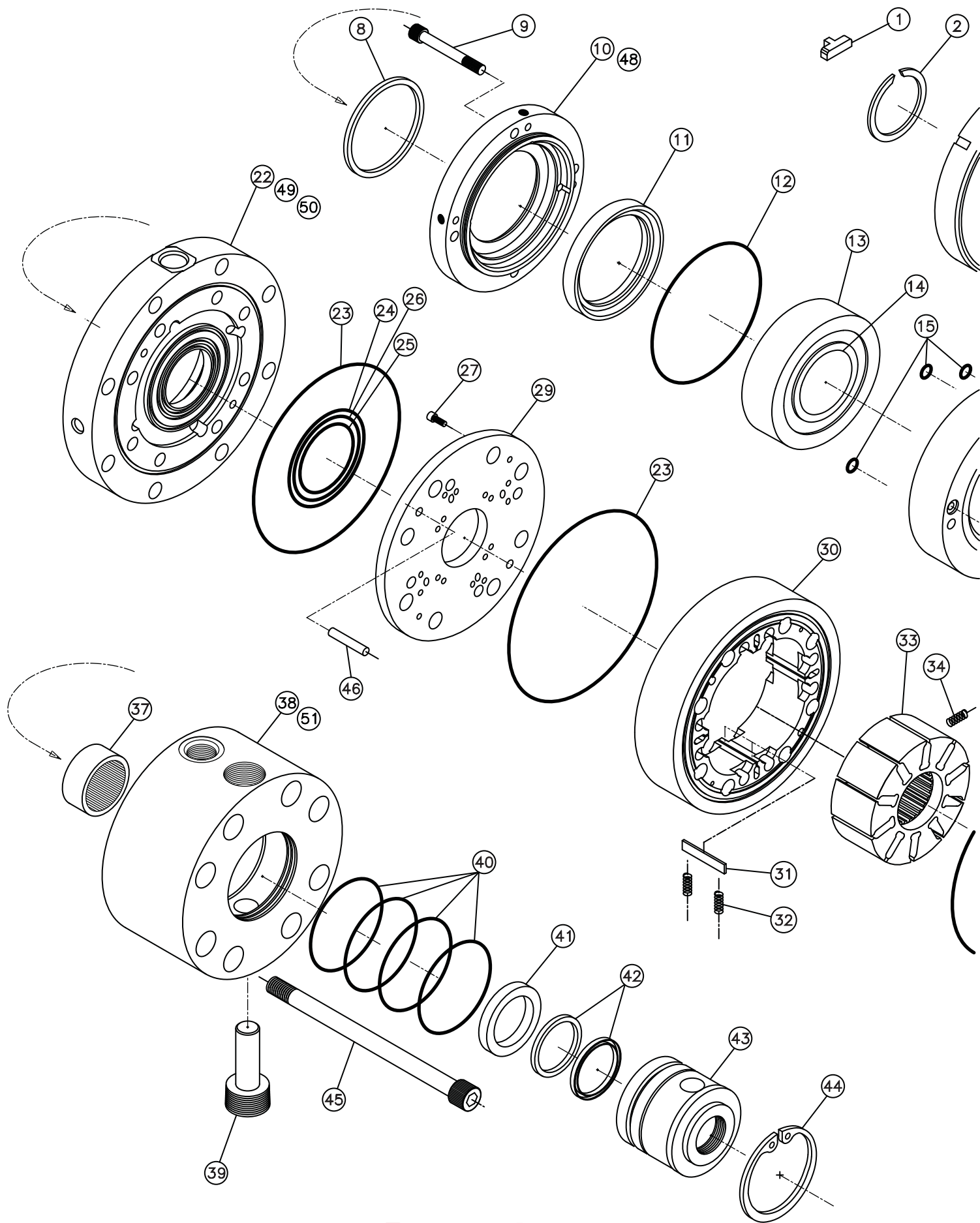
42	X0370841	SEAL PLATE, RR HSG. RB -14	1
43	V0370833*	SNAP RING	1
44	V0370931	BOLT	8
45	V0371745	BELLEVILLE WASHER	1
46	V0370431	DOWEL PIN	2
47	V0150844	1/8 PIPE PLUG	3
48	V0150868	1/4 PIPE PLUG	3
49	V0150938	3/8 O-RING BOSS PLUG	1



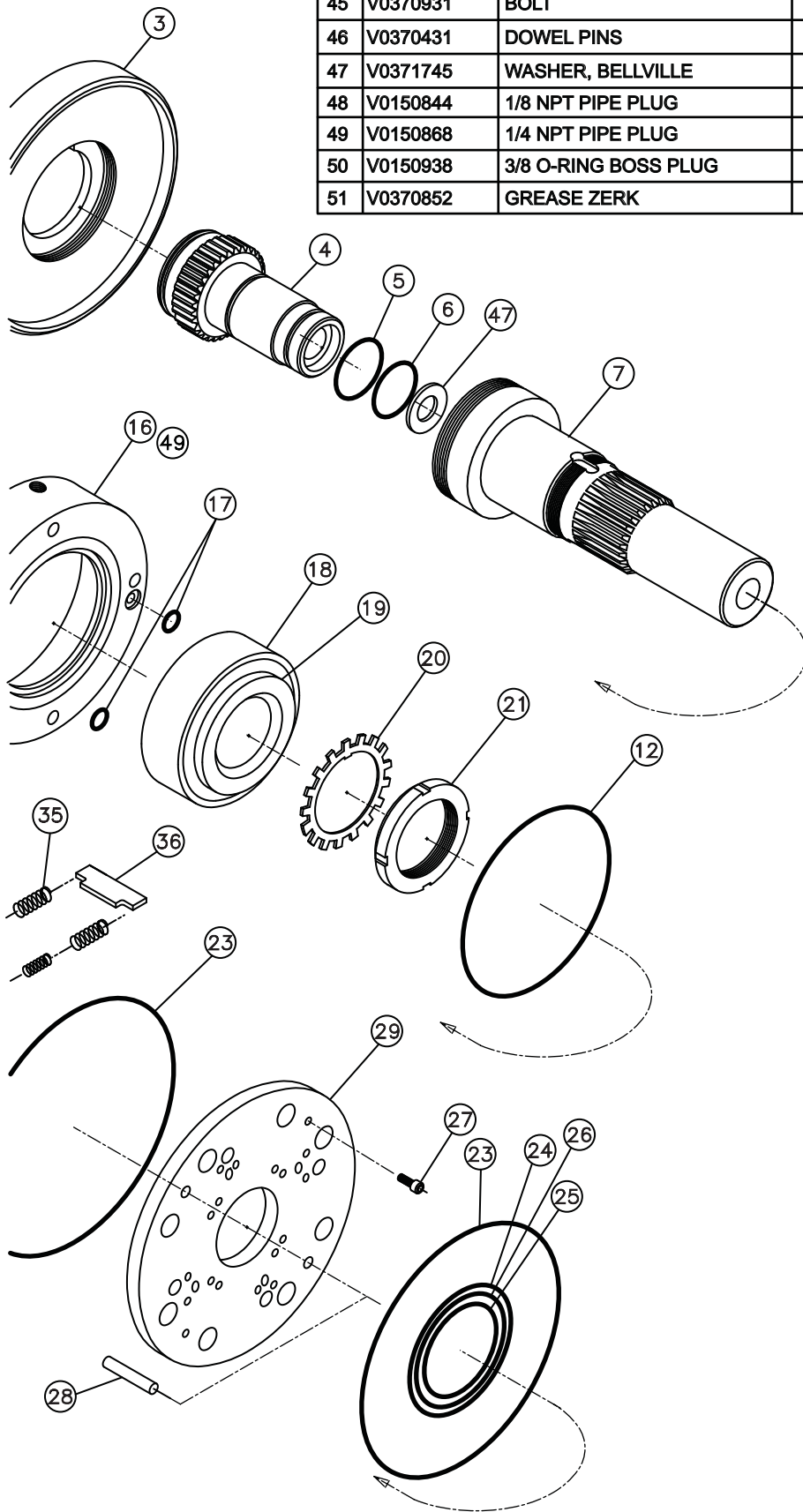
SERIES 16 EXPD. VIEW, -14 ROOFBOLTER			
ITEM	PART NO.	DESCRIPTION	QTY
1	X0371738	KEY, RB, SLINGER, CHUCK	1
2	V0371736	SNAP RING, RB CHUCK	1
3	X0370914	SLINGER, RB, LEFT HAND	1
4	X0150726	CHUCK, EXTENDED RB	1
5	V0150774*	O-RING, CHUCK BODY, LG.	1
6	V0150752*	O-RING, CHUCK BODY, SM.	1
7	X0370795	SHAFT, ROOF BOLTER	1
8	V1250112*	DUST SEAL	1
9	V0150108	BOLT, SEAL PLATE	4
10	X0371104	SEAL PLATE, RB, QUAD, ECD	1
11	V0370134*	SEAL, QUAD RING, RB	1
12	V0150610*	O-RING, SEAL PLT. & BH	2
13	V0370736	BEARING, CUP, RB LARGE	1
14	V0370737	BEARING, CONE, RG, LARGE	1
15	V0371109*	O-RING, RB, ECD, SL. PLT./BRG. H.	3
16	X0371106	BEARING HOUSING, RB, ECD	1
17	V0371110*	O-RING, RB, ECD, B.H./FRT. HSG.	2
18	V0370739	BEARING, CUP, RB SMALL	1
19	V0370738	BEARING, CONE, RB SMALL	1
20	V0370709	LOCKWASHER	1
21	V0370771	BEARING NUT	1
22	X0371156	FRONT HOUSING, RB, ECD	1
23	V0370610*	O-RING, MAIN	4
24	V0370810*	O-RING, THERMAL LARGE	2
25	V0370811*	O-RING, THERMAL SMALL	2
26	V0371829*	O-RING, THERMAL MIDDLE	2
27	V0150620	PLATE SCREW	4
28	V0370430	DOWEL PIN	2
29	X0370618	PLATE, TIMING	2
30	X0370406	STATOR, GA-12	1
	X0370404	STATOR, GA-16	1
	X0370414	STATOR, GA-10.5	1
31	X0150410^	STATOR VANE	4
32	V0370420^	STATOR VANE SPRING	8
33	X0370300PC	ROTOR, S	1
34	V1250321^	ROTOR VANE SPRING, INNER	20
35	V1250320^	ROTOR VANE SPRING, OUTER	20
36	X0370313PC^	ROTOR VANE, S	10
37	V0370720	NEEDLE BEARING	1
38	X0371823	REAR HOUSING, RB -14	1
39	V0150107*	O-RING, REAR SEAL PLATE	2
40	V0370817*	U-CUPS SEALS	2
41	V0370809	DOWEL PIN	1

* INCLUDED IN -14 SEAL KIT - KT-SE-0370970

^ INCLUDED IN VANE KIT - KT-VA-0371914 PCDN



43	X0370847	SEAL PLATE, REAR, RB WATER/VAC -18	1
44	V0370833*	SNAP RING	1
45	V0370931	BOLT	8
46	V0370431	DOWEL PINS	2
47	V0371745	WASHER, BELLVILLE	1
48	V0150844	1/8 NPT PIPE PLUG	3
49	V0150868	1/4 NPT PIPE PLUG	3
50	V0150938	3/8 O-RING BOSS PLUG	1
51	V0370852	GREASE ZERK	1

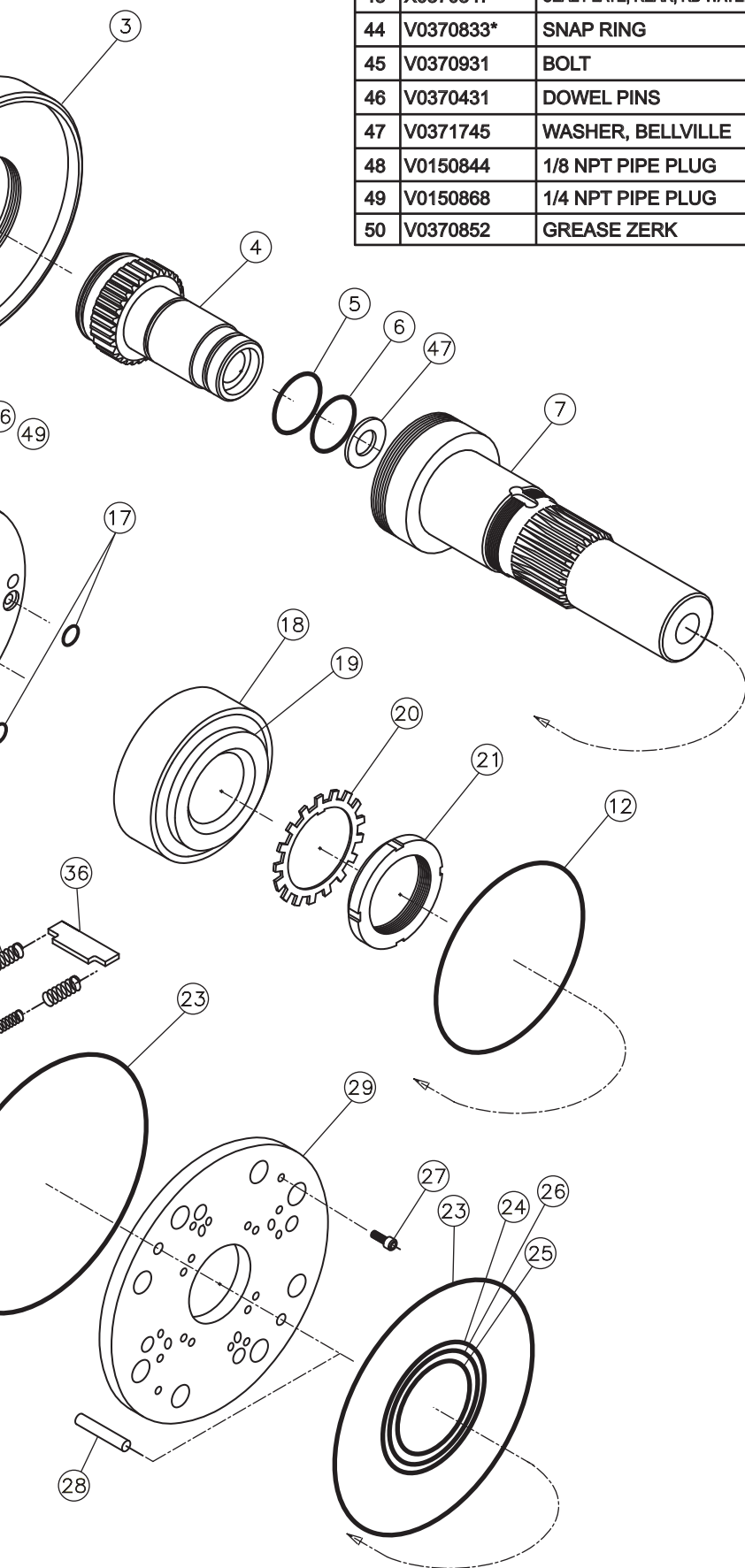


SERIES 16 ROOF BOLTER WATER/VAC-18			
ITEM	PART NO.	DESCRIPTION	QTY
1	X0371738	KEY, RB SLINGER, CHUCK	1
2	V0371736	SNAP RING, RB CHUCK	1
3	X0370914	SLINGER, RB, LEFT HAND	1
4	X0150726	CHUCK, EXTENDED RB	1
5	V0150774*	O-RING, CHUCK BODY, LG.	1
6	V0150752*	O-RING, CHUCK BODY, SM.	1
7	X0370796	SHAFT, RB, WATER VAC -18	1
8	V1250112*	DUST SEAL	1
9	V0150108	BOLT, SEAL PLATE	4
10	X0371113	SEAL PLATE, RB, SCNWY, ECD	1
	X0371104	SEAL PLATE, RB, QUAD, ECD	1
11	V1250187*	SEAL, TCN, 3-1/2"	1
	V0370134*	SEAL, QUAD RING, RB	1
12	V0150610*	O-RING, SEAL PL. & BRG. HSG.	2
13	V0370737	BEARING, CUP, RB LARGE	1
14	V0370736	BEARING, CONE, RB LARGE	1
15	V0371109*	O-RING, RB, ECD, SL. PLT./BRG. H.	3
16	X0371106	BEARING HOUSING, RB, ECD	1
17	V0371110*	O-RING, RB, ECD, B.H./FRT.HSG.	2
18	V0370739	BEARING, CUP, RB SMALL	1
19	V0370738	BEARING, CONE, RB SMALL	1
20	V0370709	LOCKWASHER	1
21	V0370771	BEARING NUT	1
22	X0371156	FRONT HOUSING, RB, ECD	1
23	V0370610*	O-RING, MAIN	4
24	V0370810*	O-RING, THERMAL, LARGE	2
25	V0370811*	O-RING, THERMAL, SMALL	2
26	V0371829*	O-RING, THERMAL, MIDDLE	2
27	V0150620	PLATE SCREW	4
28	V0370430	DOWEL PINS	2
29	X0370618	PLATE, TIMING	2
30	X0370406	STATOR, GA-12	1
	X0370404	STATOR, GA-16	1
	X0370414	STATOR, GA-10.5	1
31	X0150410^	STATOR VANE	4
32	V0370420^	STATOR VANE SPRING	8
33	X0370300PC	ROTOR	1
34	V1250321^	ROTOR VANE SPRING, INNER	20
35	V1250320^	ROTOR VANE SPRING, OUTER	20
36	X0370313PC^	ROTOR VANE	10
37	V0370720	NEEDLE BEARING	1
38	X0371825	REAR HOUSING, RB, WATER VAC -19	1
39	X0370853	LOCATOR PIN	1
40	V0150107*	O-RING, REAR SEAL PLATE	4
41	V0370178*	SEAL, SHAFT, TCN, 2"	1
42	V0370817*	U-CUPS SEALS	2

* INCLUDED IN -18 SEAL KIT - KT-SE-0370982

^ INCLUDED IN VANE KIT - KT-VA-0371914 PCDN





43	X0370847	SEAL PLATE, REAR, RB WATER/VAC -18	1
44	V0370833*	SNAP RING	1
45	V0370931	BOLT	8
46	V0370431	DOWEL PINS	2
47	V0371745	WASHER, BELLVILLE	1
48	V0150844	1/8 NPT PIPE PLUG	3
49	V0150868	1/4 NPT PIPE PLUG	3
50	V0370852	GREASE ZERK	1

SERIES 16 ROOF BOLTER WATER/VAC-19			
ITEM	PART NO.	DESCRIPTION	QTY
1	X0371738	KEY, RB SLINGER, CHUCK	1
2	V0371736	SNAP RING, RB CHUCK	1
3	X0370914	SLINGER, RB, LEFT HAND	1
4	X0150726	CHUCK, EXTENDED RB	1
5	V0150774*	O-RING, CHUCK BODY, LG.	1
6	V0150752*	O-RING, CHUCK BODY, SM.	1
7	X0370796	SHAFT, RB, WATER VAC -18	1
8	V1250112*	DUST SEAL	1
9	V0150108	BOLT, SEAL PLATE	4
10	X0371113	SEAL PLATE, RB, SCNWY, ECD	1
	X0371104	SEAL PLATE, RB, QUAD, ECD	1
11	V1250187*	SEAL, TCN, 3-1/2"	1
	V0370134*	SEAL, QUAD RING, RB	1
12	V0150610*	O-RING, SEAL PL. & BRG. HSG.	2
13	V0370737	BEARING, CUP, RB LARGE	1
14	V0370736	BEARING, CONE, RB LARGE	1
15	V0371109*	O-RING, RB, ECD, SL. PLT./BRG. H.	3
16	X0371106	BEARING HOUSING, RB, ECD	1
17	V0371110*	O-RING, RB, ECD, B.H./FRT.HSG.	2
18	V0370739	BEARING, CUP, RB SMALL	1
19	V0370738	BEARING, CONE, RB SMALL	1
20	V0370709	LOCKWASHER	1
21	V0370771	BEARING NUT	1
22	X0371157	FRONT HOUSING, RB, ECD	1
23	V0370610*	O-RING, MAIN	4
24	V0370810*	O-RING, THERMAL, LARGE	2
25	V0370811*	O-RING, THERMAL, SMALL	2
26	V0371829*	O-RING, THERMAL, MIDDLE	2
27	V0150620	PLATE SCREW	4
28	V0370430	DOWEL PINS	2
29	X0370618	PLATE, TIMING	2
30	X0370406	STATOR, GA-12	1
	X0370404	STATOR, GA-16	1
	X0370414	STATOR, GA-10.5	1
31	X0150410^	STATOR VANE	4
32	V0370420^	STATOR VANE SPRING	8
33	X0370300PC	ROTOR	1
34	V0370321^	ROTOR VANE SPRING, INNER	20
35	V0370320^	ROTOR VANE SPRING, OUTER	20
36	X0370313PC^	ROTOR VANE	10
37	V0370720	NEEDLE BEARING	1
38	X0371825	REAR HOUSING, RB, WATER VAC -19	1
39	X0370853	LOCATOR PIN	1
40	V0150107*	O-RING, REAR SEAL PLATE	4
41	V0370178*	SEAL, SHAFT, TCN, 2"	1
42	V0370817*	U-CUPS SEALS	2

* INCLUDED IN -19 SEAL KIT - KT-SE-0370982

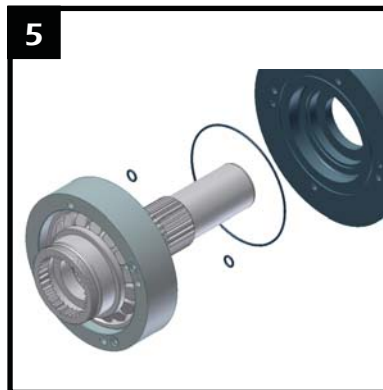
^ INCLUDED IN VANE KIT - KT-VA-0371914 PCDN

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

Removal of slinger and chuck



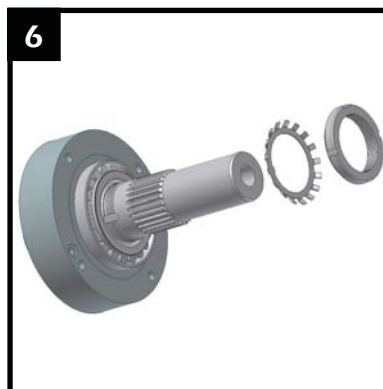
Remove snap ring, chuck key, & slinger (LH threads).



Remove bearing housing, shaft, & bearing assembly from the main motor. Remove the bearing housing-to-front housing o-ring & (2) small case drain circuit o-rings. Inspect for any damage. Replace if required.

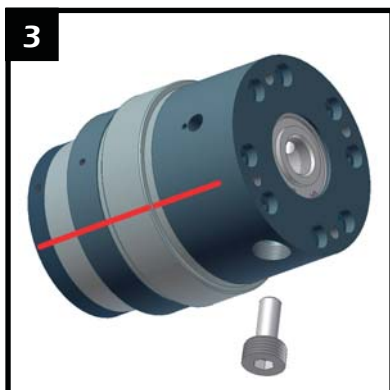


Remove chuck with (2) o-rings and Bellville washer.



Pry / bend lockwasher tab out of locknut. Remove locknut and lockwasher from the shaft.

Mark Motor for Disassembly (-19 model shown)

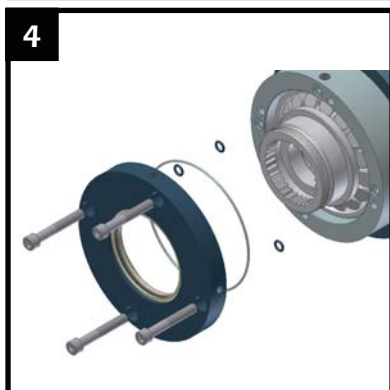


To ensure proper orientation during assembly, use a laquer paint pen to mark a line down the side of the motor. Loosen and remove the locator pin from the rear housing.

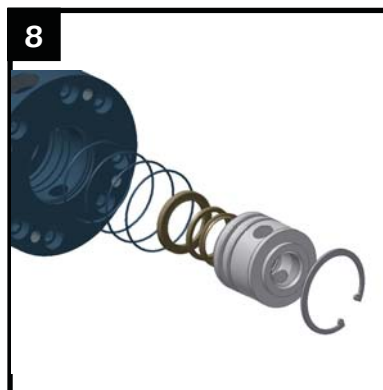


Remove the small taper bearing from the shaft/housing. Remove the large taper bearing from the bearing housing, then remove the bearing from the shaft.

Disassembly of Seal Plates and Shaft



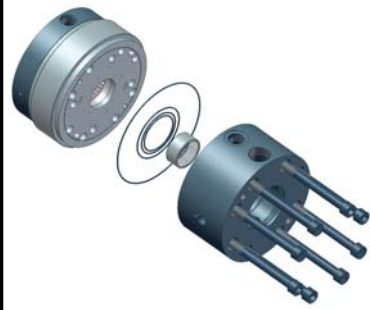
Remove (4) 3/8-16 seal plate bolts and carefully remove the seal plate, taking care of the seal over the threads on the shaft. Remove/inspect the pilot o-ring & (3) small case drain circuit o-rings. Inspect the oil and dust seals in the seal carrier for wear or damage. Replace if required.



Remove rear snap ring and rear seal plate from rear housing of main motor.
a) -18, -19 Models:
Remove (4) o-rings, (2) u-cups, and oil seal from rear seal plate
b) -14 Model:
Remove (2) o-rings and (2) u-cups from rear seal plate. Remove dowel pin.

Disassembly of Motor

9



Remove (8) 5/8-11 main motor assembly bolts from main motor. Remove rear housing from rotating group. If necessary due to damage or wear, remove the needle bearing from the rear housing and replace. Otherwise, the bearing may be left intact. Remove o-rings from rear housing. Inspect for damage/wear and replace if required (recommended).

13



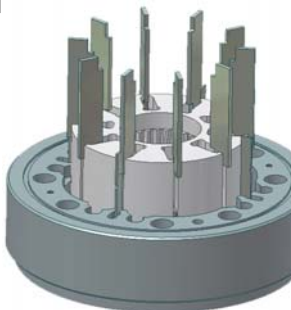
- 1) Replace plate on rotor/stator cartridge.
- 2) Turn rotor/stator cartridge over.
- 3) Repeat steps 11 & 12.

10



Remove front housing from rotating group. Remove o-rings from front housing. Inspect for damage/wear and replace if required (recommended).

14



- 1) Remove the rotor.
- 2) Remove both the rotor and the stator vanes.
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.
- 3) Separate parts and rinse in solvent tank.

Disassembly of Rotating Group

11



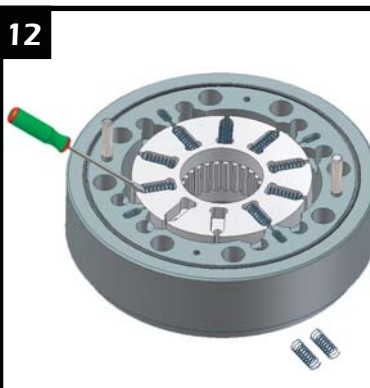
- 1) Place cartridge on any object which will hold it off the table.
- 2) Remove two each 10-32 plate screws.
- 3) Remove timing plate.

15



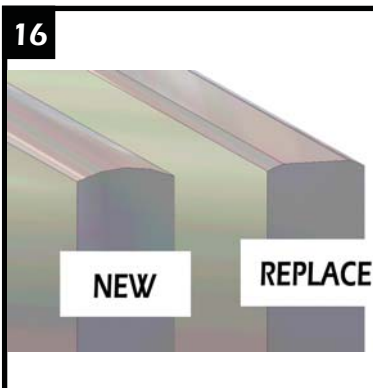
Inspect all parts and replace any parts which obviously show excessive wear or damage. We recommend changing all springs and seals whenever the motor has been disassembled.
NOTE! Newer vane kits include the new deep notch vanes and heavier duty springs. Do not mix these parts with older parts. Replace ALL parts with the newer versions.

12



Using a small screwdriver or pick, remove o-ring and all rotor and stator springs.

16



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.

Assembly of Rotor / Stator Cartridge

17



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

21



1) Reverse the procedures in steps 14, 13, 12, and 11. Before installing timing plate onto completed sides of rotating group, pour a small amount of hydraulic oil onto rotor surface.
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.

18



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.

Assembly of Motor

22



Using a medium India honing stone, lightly dress all machine surfaces to remove any raised metal or burrs. Pay particular attention to the front and rear housing machined faces. Rough handling can cause raised surfaces near the O.D. of the housings which will prevent proper seating of the timing plates to the machined surfaces of the housing. NOTE: The pedestal surface (center of the front and rear housing containing two or three o-rings) is .002-.003 below the outer machined surface. Dress these surfaces independently.

19



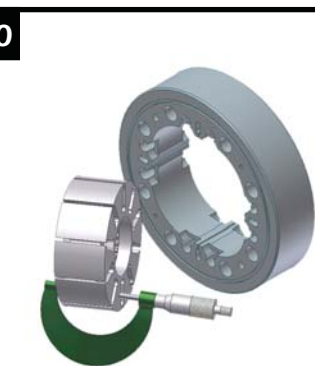
STATOR: Normal wear results in polishing of cam form which does not impair motor performance. Noticeable wear may be apparent along the corner of one side of the stator vane slot. This does not necessarily require replacement of the stator, but may slightly affect volumetric efficiency.

23



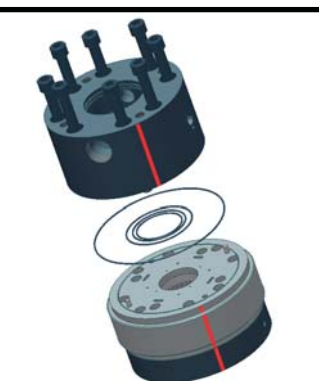
When installing the u-cups back into the rear seal plate, special care should be taken to correctly orient them into their grooves. The open faces of the u-cups should face away from each other. See the cross sectional drawing on the back of this manual for further reference.

20



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

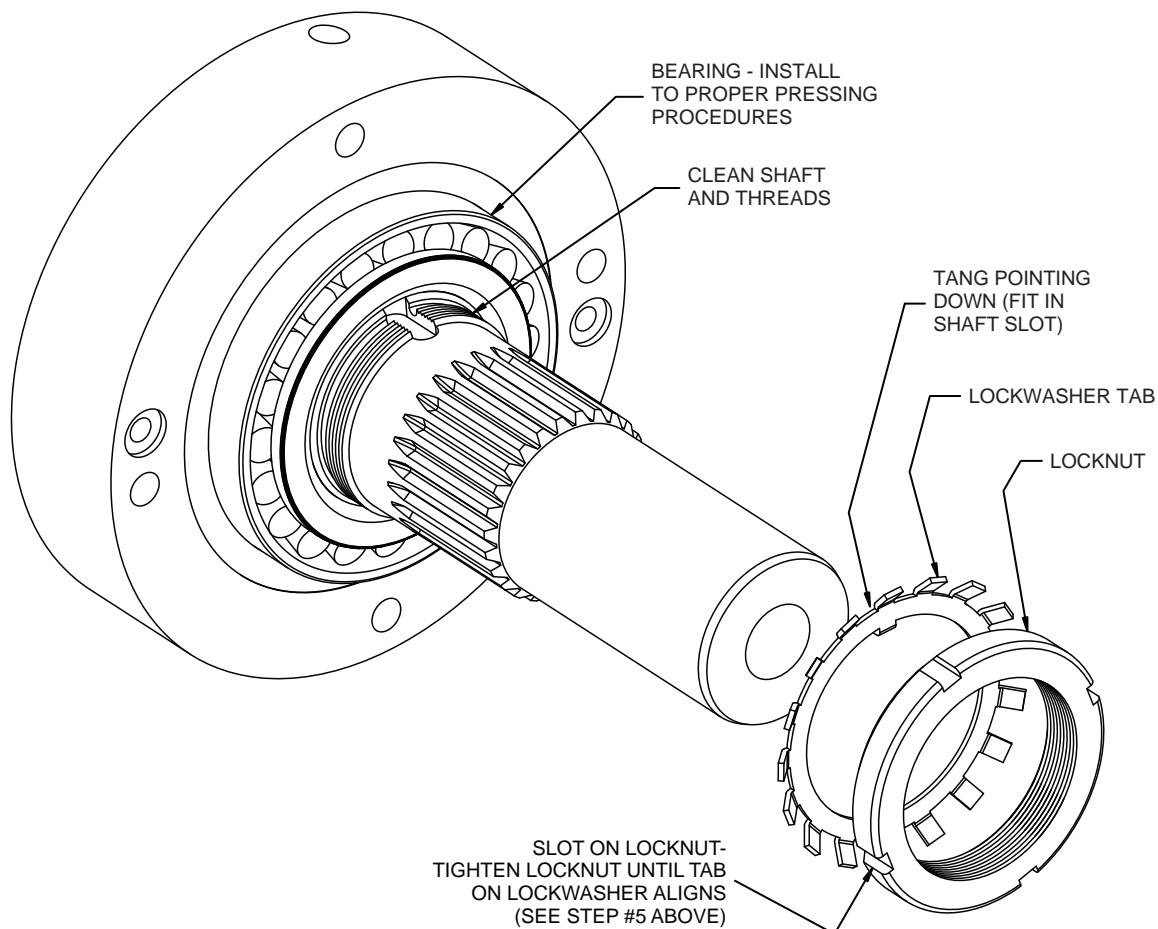
24



Assemble the motor by reversing the previous procedures. Insure that the main body and pedestal o-rings are held in place by using an adequate amount of grease in the o-ring grooves. Line up the housings and rotating group with the paint line made on the motor in step 3. Grease the threads of the 5/8-11 bolts and insert into motor. Set torque wrench to 200 ft. lbs. and tighten in a star pattern. Install shaft, seal plate and snap ring in reverse order of previous procedures and be sure to install locator pin in rear housing. Rotate shaft to insure no binding is present. Re-install chuck & slinger.

PROCEDURE FOR INSTALLING LOCKNUT 16 SERIES ROOF BOLTER

1. Clean the shaft, locknut (part no. 0370771), and the thread area before assembly.
2. Prior to assembly, test the thread fit by assembling the locknut onto the shaft threads several turns. Insure working thread form. Remove locknut.
3. Press the bearing onto the shaft according to proper pressing procedures (see other details for information).
4. Place lockwasher (part no. 0370709), with the tang pointing down to match the slot in shaft, onto the shaft, flat on top of bearing.
5. Spin locknut onto the shaft until it is tight against lockwasher and bearing. Tighten the locknut to achieve a rolling torque of 20-25 in./lbs. Within this rolling torque range, tighten the locknut until it is squarely aligned with one of the tabs on the lockwasher.
6. Bend one tab only into the slot on the locknut to prevent the locknut from loosening on the shaft. Do not attempt to bend a partially aligned tab. (See details below.)



Information:

Bolt Torque -

Main Bolts (5/8-11): 200 ft. lbs.

Bearing Hsg Seal Plate (3/8-16):
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:

16 series vane & spring kit

#KT-VA-0371914 PCDN

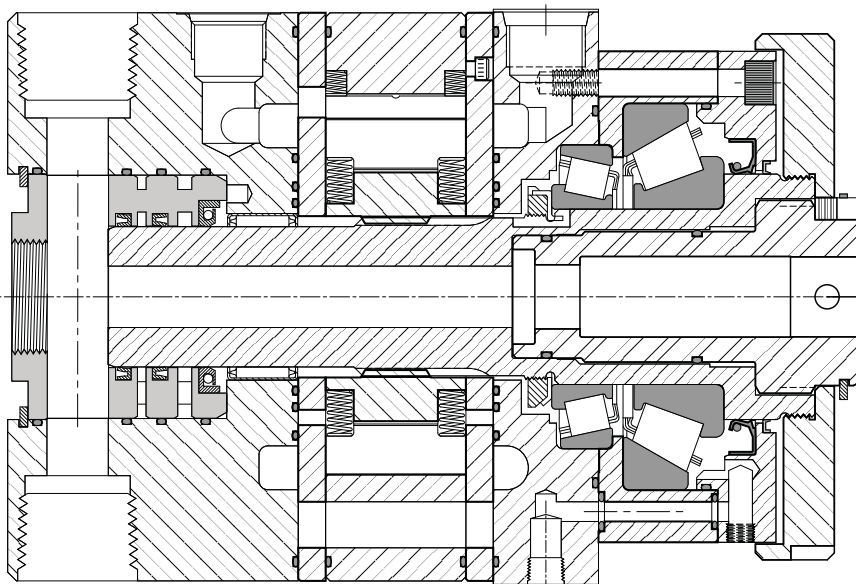
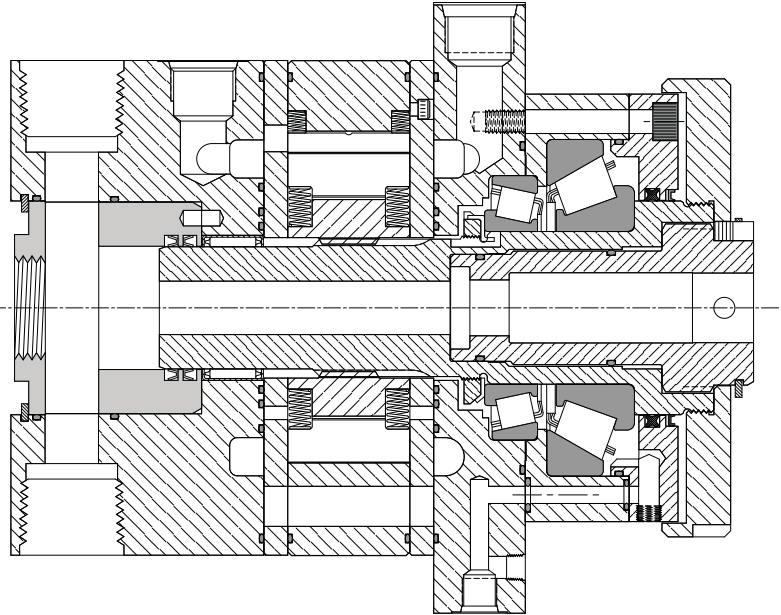
16 series -14 seal kit

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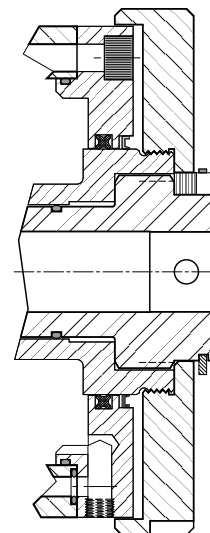
16 series -18, -19 seal kit

#KT-SE-0370982

-14



-19



QUAD RING SEAL