

Repair Instructions

DR 620 Series

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Chapter

1

DR 620 Series Diagram

Topics:

- [DR 620 Exploded View](#)

DR 620 Exploded View

Exploded View

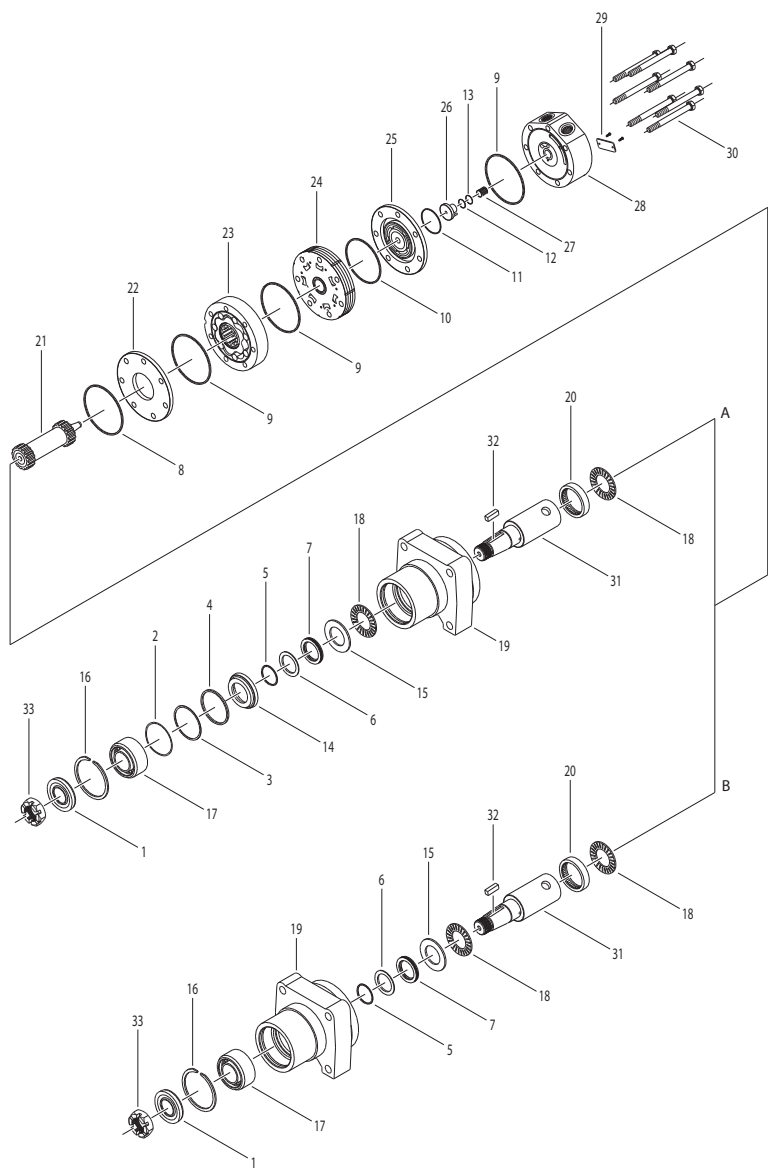


Table 1: Options

Description	Option Letter
Seal carrier design	A
Design without seal carrier	B

Components List

Description	Item Number	Description	Item Number
Dust seal	1	Thrust washer	18

Description	Item Number	Description	Item Number
Wire ring	2	Housing	19
Metal backup shim	3	Rear housing bearing	20
High pressure seal	4	Drive link	21
Metal backup shim	5	Wear plate	22
Backup seal	6	Rotor assembly	23
Shaft seal	7	Manifold	24
Rear housing seal	8	Commutator assembly	25
Body seal	9	Piston	26
Manifold seal	10	Piston spring	27
Commutator seal	11	Endcover	28
O-ring seal	12	ID tag assembly	29
Backup seal	13	Assembly bolt	30
Seal carrier	14	Shaft	31
Thrust washer	15	Shaft key	32
Bearing retaining ring	16	Shaft nut	33
72mm Bearing	17		

Note: The motor design that utilizes a seal carrier will use the larger O.D. backup seal and shaft seal.

Chapter

2

DR 620 Series Service Instructions

Topics:

- [*DR 620 Motor Section Disassembly*](#)
- [*DR 620 Housing/Shaft with Seal Carrier Disassembly & Assembly*](#)
- [*DR 620 Housing/Shaft without Seal Carrier Disassembly & Assembly*](#)
- [*DR 620 Motor Section Assembly*](#)

dimensions: mm [in]

Note: In December 2006, the 620 series incorporated a design change. Please refer to the exploded view drawing to determine which motor is being serviced and follow the appropriate instructions for that design.

Housing and body seals on products manufactured after July 1, 2016 are o-ring seals. Prior to this date the these seals were square cut seals. It is recommended that if the product being serviced has square seals to replace with the square seals in this kit, likewise if the product has o-ring seals, replace with the o-ring seals in this kit.

DR 620 Motor Section Disassembly

Same Instructions For Both Designs

1. Remove all shaft related components from shaft (31) (i.e. keys, wire rings, nuts).
 - a) To aid in reassembly of the motor, make a "V" shaped set of lines from the endcover to the housing using either paint or a marker.
 - b) With shaft facing down, secure motor in vise by clamping on to housing (19).
2. Loosen and remove seven bolts (30) holding motor assembly together.
 - a) Remove endcover (28) carefully as piston (26) and spring (27) may fall out.
 - b) If piston does not come out, carefully pry piston (26) out of endcover (28) and lay aside.
 - c) Remove O-Ring seal (12) and backup seal (13) from endcover and discard seals.
 - d) Remove spring (27) and lay aside.
3. Lift commutator container and commutator (25) from motor and lay aside.
 - a) Place commutator on a flat, clean surface with the seal (11) facing up.
 - b) Place the tip of a small screwdriver on the seal (11) and gently tap until opposite side of seal lifts from groove.
 - c) Remove seal (11) and discard.
4. Remove manifold (24), rotor set (23) and divider plate (22) from motor.
 - a) Remove all seals (8, 9, & 10) from components and discard.



Caution: Do not allow rolls to drop from rotor assembly (23) when removing rotor assembly from motor.

- b) Remove drive link (21) and thrust bearing (18) from motor and lay aside.
- c) Gently tap shaft (31) upward from housing (19) and remove through rear of housing and lay aside.

DR 620 Housing/Shaft with Seal Carrier Disassembly & Assembly

Design That Utilizes A Seal Carrier (13)

1. Turn housing over and remove retaining snap ring (16) from inner core of housing.
 - a) Turn housing over again.
 - b) Using a drift punch through the rear of the housing, tap against the inner race of the 72mm bearing (17) to remove the bearing through the top of the housing.
 - c) Pry dust seal (1) from bearing (17).
 - d) Then turn housing over again and push the seal carrier (14), thrust washer (15) and thrust bearing (18) down until you can get to the wire ring (2).
2. Remove wire ring (2), steel backup shim (3) and high pressure seal (4) from inner bore groove with a small screwdriver.
 - a) Lift the seal carrier (14), thrust washer (15) and thrust bearing (18) from the housing bore.
 - b) Carefully pry shaft seal (7), backup seal (6), and metal backup shim (5) from seal carrier (14) and discard.
 - c) Lay seal carrier (14), thrust washer (15) and thrust bearing (18) aside.

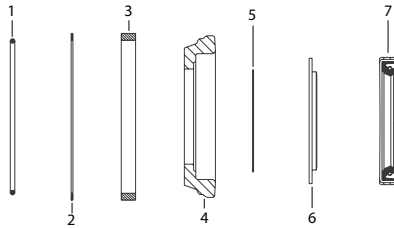
Note: If a new thrust washer (15) and seal carrier (14) is included in kit, old items may be discarded.

Note: At this point, all parts should be cleaned in an oil-base solvent and dried using compressed air (For safety, observe all OSHA safety guidelines). All new seals should be lightly coated in clean oil prior to installation.

3. Place shaft (31) on a clean flat surface with output end facing up.
 - a) Place thrust bearing (18) over the shaft.

Note: If thrust bearing has integral washer, make sure washer surface faces down.
 - b) Then thrust washer (15) on shaft (See Technical Bulletin PI444004 to determine correct thrust washer to use).

- c) Lightly coat seal area of shaft with clean oil and place plastic installation sleeve with shaft seal (7) down onto shaft covering all splines, keyways and wire ring grooves.
- d) Slide shaft seal (7) down onto shaft (31) making sure that lip on seal faces down (See *Figure 1: Figure 1* on page 11 for correct seal orientation) until it contacts thrust washer (15).
- e) Remove plastic installation sleeve.
- f) Carefully install the backup seal (6) onto the shaft (31) with the flat side up and the seal lip facing the shaft seal (7).
- g) Place the metal backup shim (5) onto the shaft and against the backup seal (6).
- h) Place the seal carrier (14) onto the shaft (large end down) and carefully press the seal carrier (14) down onto the seal assembly using an arbor press and sleeve to compress the seal into the carrier.



- | | |
|---|--------------------|
| 1 | Wire ring |
| 2 | Metal backup shim |
| 3 | High pressure seal |
| 4 | Seal carrier |
| 5 | Metal backup shim |
| 6 | Backup seal |
| 7 | Shaft seal |

Figure 1: Figure 1

4. With pilot side facing up, place housing (19) on spacers to raise housing approximately 6.4 [.250] above work surface.

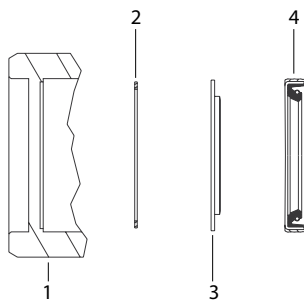
Note: Spacers should allow shaft to contact work surface.

- a) Place shaft/seal carrier assembly into housing (19).
- b) Install high pressure seal (4) into groove in housing.
- c) Install metal backup shim (3) against high pressure seal (4) in groove in housing bore by squeezing the shim (3) between thumb and forefinger to bow shim.
- d) While maintaining bow in shim, start the shim into the groove and use a small screwdriver to push the shim into groove.
- e) Install wire ring (2) into the groove, making sure that the ends are butted.
5. While holding shaft into housing, place housing/shaft assembly in vise with shaft end down.
 - a) Making sure that end of drive link (21) with crowned splines goes into shaft end, install drive link (21) into shaft and tap lightly to seat the seal carrier against the wire ring (2).
 - b) Place thrust bearing (18) over drive link (21).
 - c) If seal carrier (14) is properly seated against wire ring (2), thrust bearing (18) will be flush with rear surface of housing.

DR 620 Housing/Shaft without Seal Carrier Disassembly & Assembly

Design That Does NOT Utilizes A Seal Carrier (13)

1. Position the housing (19) in vise and use a slide and hammer type bearing puller to remove the rear housing bearing (20).
 - a) Remove the thrust washer (15) and thrust bearing (18) and set aside.
 - b) Using a small screwdriver carefully pry the shaft seal (7), backup seal (6) and metal shim (5) from housing bore and discard.
 2. Turn housing over and remove retaining snap ring (16) from inner core of housing.
 - a) Turn housing over again.
 - b) Using a drift punch through the rear of the housing, tap against the inner race of the 72mm bearing (17) to remove the bearing through the top of the housing.
 - c) Pry dust seal (1) from bearing (17) and discard.
- Note:** At this point, all parts should be cleaned in an oil-base solvent and dried using compressed air (For safety, observe all OSHA safety guidelines). All new seals should be lightly coated in clean oil prior to installation.
3. Place housing (19) in vise with the seven bolt assembly holes facing up.
 - a) Place metal shim (5) in the smallest diameter recess in the housing (19).
 - b) Install the backup seal (6) into the housing (19) with the flat side down and the seal lip facing up.
 - c) Insert shaft seal (7) down into housing (19) making sure that lip on seal faces up (See [Figure 2: Figure 2](#) on page 12 for correct seal orientation).
 - d) Install thrust washer (15) into housing and using an arbor press, seat the shaft seal (7) into housing (19), then place the thrust bearing (18) into housing.



- | | |
|---|-------------------|
| 1 | Housing |
| 2 | Metal backup shim |
| 3 | Backup seal |
| 4 | Shaft seal |

Figure 2: Figure 2

4. Place the rear housing bearing (20) onto the rear housing bore and press to a depth of 3.6 [.14] from the rear surface of the housing (19) to the top of the bearing (20).
 - a) Place the shaft (31) down into housing (19) and place thrust bearing (18) on top of shaft (31).
 - b) If shaft seals are properly seated against the housing (19), thrust bearing (18) will be flush with rear surface of housing.

DR 620 Motor Section Assembly

Same Instructions For Both Designs

1. Install housing seal (8) into groove in housing (19).
 - a) Place divider plate (22) onto housing (19) aligning bolt holes.
 - b) Place body seals (9) in grooves in both sides of rotor (23).
 - c) Place rotor (23) onto divider plate (22) with side of rotor with chamfer in splines facing divider plate (22).

- d) Place manifold (24) over rotor (23) with seal groove side up. Install manifold seal (10).
- 2. Install the commutator seal (11) into the commutator (25) with the metal side facing up.
 - a) Use finger pressure to press the seal down flush with the surface of the commutator.
 - b) Place the commutator container onto the manifold (24) and then place the commutator onto the protruding end of the drive link (21) making sure that the seal side faces up.
- 3. Install the remaining body seal (9) in the groove in the face of the endcover (28).
 - a) Install piston spring (27) into endcover (28), then the white backup seal (13) followed by the O-Ring seal (12).
 - b) Lining up the alignment pin with the hole in the endcover, press piston (26) into the endcover (28).
 - c) While holding the piston (26) in the endcover, lower the endcover assembly on to the motor.
 - d) Check to make sure that the endcover ports are in their original position.
- 4. Install the seven assembly bolts (30) and pre-torque to 13.6 Nm [10 ft. lbs.] Final torque all bolts to 67.8 Nm [50 ft. lbs.]
- 5. Install dust seal (1) flush with the pilot face of the housing (19) making sure that the lip side of the seal faces out.

Chapter

3

DR 620 Series Parts Listing

Topics:

- [*DR 620 Replacement Kits*](#)
-

DR 620 Replacement Kits

Available Kits

Note: Refer to the [Exploded View](#) on page 6 for item numbers

Table 2: Seal kit

Description	Exploded View Item Number	Qty. In Kit	Order Number
Dust seal	1	1	600555000(Includes item numbers 1-13)
Split wire ring	2	1	
Metal backup shim	3	1	
High pressure seal	4	1	
Metal backup shim	5	1	
Backup seal	6	2	
Shaft seal	7	2	
Housing seal	8	1	
Body seal	9	3	
Manifold seal	10	1	
Commutator seal	11	1	
O-ring seal	12	1	
Backup seal	13	1	
Seal carrier	14	1	500444003(Includes item numbers 14 & 15)
Thrust washer	15	1	

Table 3: Miscellaneous kits

Description	Exploded View Item Number	Order Number
Retaining snap ring	16	500018141
72mm Bearing	17	500018098
Thrust bearing	18	500018059
Rear housing bearing	20	500018002
Divider plate	22	500012004
Manifold	24	700668002
Commutator assembly	25	700668003
Endcover piston	26	700668004
Piston spring	27	700018046
1000 psi relief valve	Not shown	500018228
2000 psi relief valve	Not shown	500018231

Description	Exploded View Item Number	Order Number
3000 psi relief valve	Not shown	500018221
7/8" O-ring port plug	Not shown	700018021
1.00-20 UNEF slotted nut	33	500449304
1.00-20 UNEF solid nut	Not shown	500449303
1.00-20 UNEF pack nut	Not shown	300339303P

Rotors, drive links, and bolts

When changing motor displacements, a matching rotor, drive link, and bolt set kit must be ordered.

Exploded View Item Number	23	23	21	30
Displacement	Standard Rotor Kit	Freeturn Rotor Kit	Drive Link Kit	Bolt Set Kit
200	500167004	500167011	600140012	700664012
260	500227000	500227004	600140016	700664019
300	500247005	500247011	600140019	700664025
350	500207000	500207004	600140027	700665028
375	500307005	500307011	600140025	700664028
470	500357003	500357005	600140027	700665028
540	500407005	500407011	600140033	700665033
750	500607005	500607011	600140046	700665046

Housing kits

Exploded view item #19

Standard housing kits include the front bearing (#17), rear bearing (#20), retaining ring (#16), & dust seal (#11) installed in the housing.

Description	Order Number
#W2 & W8- wheel mount flange	500130928
#A4 & A9- 6-hole SAE "A" style	500135228

Note: All housings require the use of two 7/8" o-ring port plugs. See [Table 3: Miscellaneous kits](#) on page 16 for kit number.

Shafts and related component kits

Shaft kits come with related shaft components (i.e. keys, nuts, etc.). To order individual shaft components (i.e. keys, nuts, bolts, washers, or wire rings) use the kit number for each individual part.

Exploded View Item Number	31	32	33	Not Shown	Not Shown	Not Shown
Description	Shaft Kit	Key Kit	Nut Kit	Bolt Kit	Washer Kit	Wire Ring Kit
#25- 1-1/4" Tapered	500011302	500449101	See Table 3: Miscellaneous kits on page 16	-	-	-
#07- 1-1/4" Straight	500011204	500449102		500449301	500449302	500449201
#09- 14 Tooth spline	500011107	-		-	-	500449201
#08- 32mm Straight	500011205	500449103		-	-	500449201
#03- 6-B Spline	500011602	-		-	-	-
#15- 1" Straight	500011206	500449100		-	-	-

Endcover kits

Exploded view item #28)

Endcover kits come assembled with exploded view item numbers 12, 13, 26, &27. To order a relief valve for the valve cavity endcovers, see the [Table 3: Miscellaneous kits](#) on page 16 listing for relief valve kit numbers.

Description	Standard Endcover Kit	Valve Cavity Endcover Kit	Internal Drain Endcover Kit	Valve Cavity & Internal Drain Endcover Kit
#1- 7/8" O-ring rear ports	700160000	700160000R	700160000D	700160000DR
#3- Manifold ports, D-shaped	-	-	700160003D	-
#5- 1-1/16" O-ring radial ports	700160005	700160005R	700160005D	700160005DR
#2- 3/4" BSP.F Radial ports	700160007	700160007R	700160007D	700160007DR
#6- 1-1/16" O-ring parallel ports	700160008	700160008R	-	-
#7- 3/4" BSP.F Parallel ports	700160009	-	-	-