



# MOTORS

## Repair Instructions

*DR 630 Series Orbital Motors*



*together in motion*

White is a leading global provider of motor and steering solutions that power the evolution of mobile and industrial applications around the world.



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# Chapter 1

## DR 630 Series Diagram

### DR 630 Exploded View

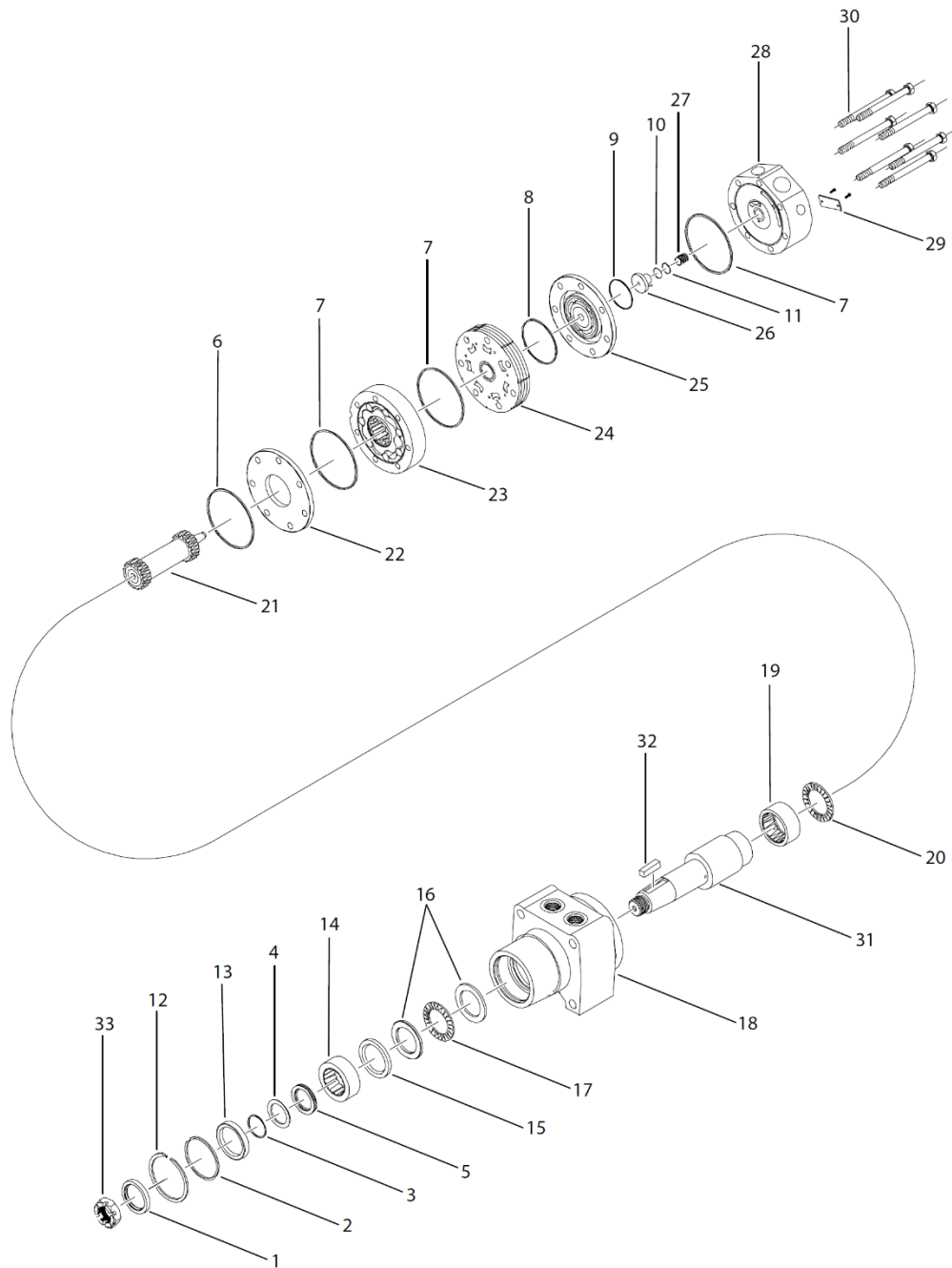


Figure 1: DR 630 Exploded View

Description	Item Number	Description	Item Number
Dust seal	1	Housing	18
High pressure seal	2	Rear housing bearing	19
Metal backup shim	3	Rear thrust bearing	20
Backup seal	4	Drive link	21
Shaft seal	5	Divider plate	22
Rear housing seal	6	Rotor	23
Body seal	7	Manifold	24
Manifold seal	8	Commutator assembly	25
Commutator seal	9	Endcover piston	26
O-ring seal	10	Piston spring	27
Backup seal	11	Endcover	28
Retaining snap ring	12	ID tag assembly	29
Seal carrier	13	Bolt	30
1.5" Bearing	14	Shaft	31
Bearing spacer	15	Key	32
Thrust washer	16	Shaft nut	33
Front thrust bearing	17		

Table 1 Parts list

# Chapter 2

## DR 630 Series Service Instructions


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### DR 630 Seal Kit Installation

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dimensions: mm [in]

**Note:** Housing and body seals on products manufactured after July 1, 2016 are o-ring seals. Prior to this date 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.

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 up, secure motor in vise by clamping on to housing (18).
2. Using a small screwdriver, pry dust seal (1) from front of housing (18).
  - a. Remove retaining snap ring (12) from groove in pilot of housing (18).
  - b. Remove motor from vise.
  - c. Reposition motor with shaft facing down and secure motor in vise.
3. 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 (10) and white backup seal (11) from endcover and discard seals.
  - d. Remove spring (27) and lay aside.
4. Lift commutator container and commutator (25) from motor and lay aside.
  - a. Place the commutator on a flat, clean surface with the seal (9) facing up.
  - b. Place the tip of a small screwdriver on the seal (9) and gently tap until the opposite side of seal lifts from groove.
  - c. Remove seal (9) and discard.
5. Remove manifold (24), rotor set (23) and divider plate (22) from motor. Remove all seals (7 & 8) from components and discard.
  - a.  **Caution:** Do not allow rolls to drop from rotor assembly (23) when removing rotor assembly from motor.
6. Using a clean rag, grasp output end of shaft (31) as close to housing as possible.
  - a. While maintaining grasp on shaft, use a rubber mallet to gently tap downwards on drive link (21) until shaft(31) comes free from housing (18).
  - b. Remove drive link (21) from shaft (31) and lay aside.
  - c. Without changing grip on shaft (31), set shaft onto a clean, flat surface with output end of shaft facing up.
  - d. Remove thrust bearing (20) from rear of housing.



**Caution:** Although shaft bearing (14) can be removed from shaft for inspection, the rollers are not held in place by the bearing cage. If bearing is removed from the shaft, the rollers will come out of the race. If no bearing problems are suspected, it is recommended that shaft bearing and thrust bearing (17) and thrust washers (16) be left on shaft.

7. Remove seal carrier (13) from shaft (31).
  - a. Using a thin, flat bladed screwdriver, carefully pry shaft seal (5), backup seal (4) and metal backup shim (3) from seal carrier (13) and discard.
  - b. Remove high pressure seal (2) from housing (18) and discard.

**Note:** At this point, all parts should be cleaned in an oil-based solvent and dried using compressed air. (For safety, observe all OSHA safety guidelines). All new seals should be lightly coated with clean oil prior to installation.
8. Place housing (31) on a clean, flat surface with shaft end of housing facing up.
9. Being careful not to cut seal on keyway, place shaft seal (5) over shaft (31) making sure that lip on seal faces down (See *Figure 2*).
  - a) Repeat process for backup seal (4) making sure that lip faces down.
  - b) Place metal backup shim (3) over shaft (31).
  - c) With flat side facing up, place seal carrier (13) down over shaft.
  - d) Using an arbor press, carefully press down on seal carrier (13) to press seal assembly (3-5) into seal carrier (13).

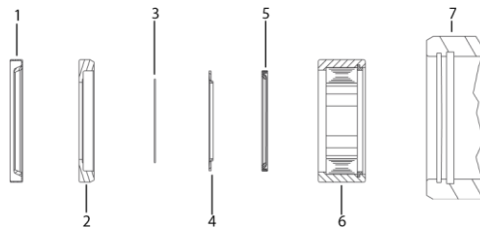


Figure 2: Correct seal orientation

- 1 Dust seal
- 2 Seal carrier
- 3 Metal backup ring
- 4 Backup seal
- 5 Shaft seal
- 6 38.1 mm [1.500 in] Bearing
- 7 Housing

10. Place shaft (31) assembly into housing (14).
  - a. If necessary, gently tap downward on shaft with a rubber mallet.
  - b. Install retaining snap ring (12) into groove in housing pilot (18).
 

**Note:** It may be necessary to lightly tap the retaining snap ring (12) to allow it to sit properly.
  - c. Using a clean rag, grasp shaft (31) and lift housing from work surface.
  - d. Position housing/shaft assembly in vise with shaft facing down and secure motor in vise by clamping on to housing.



11. Install housing seal (6) into groove in housing (18).
  - a) Place drive link (21) into end of shaft (31) and gently tap downwards with rubber mallet to seat seal carrier(13) against retaining ring (12).
  - b) Place thrust bearing (20) over drive link (21) and onto end of shaft (31).
  - c) Place divider plate (22) onto housing (18) aligning bolt holes.
  - d) Place body seals (7) in grooves on both sides of rotor (23).
  - e) Place rotor (23) onto divider plate (22) with side of rotor with chamfer in splines facing divider plate (22).
  - f) After engaging drive link splines, it may be necessary to rotate rotor (23) to align bolt holes.
  - g) Place manifold (24) over rotor (23) with seal groove side up.
  - h) Install manifold seal (8).
  
12. Install the commutator seal (9) 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.
  
13. Install the remaining body seal (7) in the groove in the face of the endcover (28).
  - a) Install piston spring (27) into endcover (28), then the white backup seal (11) followed by the O-ring seal (10).
  - 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 onto the motor.
  - d) Check to make sure that the endcover ports are in their original position.
  
14. Install the seven assembly bots (20) and pre-torque to 13.6 Nm [10 ft. lb.].
  - a) Using the bolt torque pattern in *Figure 3* final torque all bolts to  $69.8 \pm 7.5$  Nm [ $51.5 \pm 5.5$  ft. lb.].
  - b) Remove motor from vise and place on work surface with shaft facing up.
  - c) Install dust seal (1) into bore in housing pilot.
  - d) Replace shaft related components (i.e. keys, wire rings, nuts).

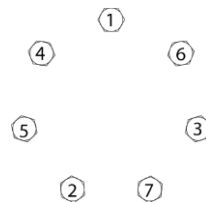


Figure 3: Correct bolt sequence

# Chapter 3

## DR 630 Series Parts Listing

### Available Kits

**Note:** Refer to the *Exploded View* for item numbers

Description	Exploded View Item Number	Qty. In Kit	Order Number
Dust seal	1	1	600555100(Includes item numbers 1-11)
High pressure seal	2	1	
Metal backup seal	3	1	
Backup seal	4	1	
Shaft seal	5	1	
Rear housing seal	6	1	
Body seal	7	3	
Manifold seal	8	1	
Commutator seal	9	1	
O-ring seal	10	1	
Backup seal	11	1	

Table 2: Seal kits

Description	Exploded View item Number	Order Number
Retaining snap ring	12	500018249
Seal carrier	13	500018238
1.5" Bearing	14	500018242
Bearing spacer	15	500018248
Thrust washer	16	700018041
Front thrust bearing	17	700018033
Rear housing bearing	19	700018012
Rear thrust bearing	20	500018059
Divider plate	22	500012004
Manifold	24	700668002
Commutator assembly	25	700668003

Endcover piston	26	700668004
Piston spring	27	700018046
7/8" O-ring port plug	Not shown	700018021
1000 psi relief valve	Not shown	500018228
2000 psi relief valve	Not shown	500018231
3000 psi relief valve	Not shown	500018221
1.00-20 UNEF slotted nut	33	500449304
1.00-20 UNEF solid nut	33	500449303
1.00-20 UNEF pack nut	33	300339303P
1.125-18 UNEF slotted nut	33	700018038
1.125-18 UNEF solid nut	33	700018054
M24 X 1.5 slotted hex nut (#46)	33	500449306

Table 3: Miscellaneous kits

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

Table 4: Rotors, drive links and spacers, and bolts

Exploded view item #18

Standard housing kits include rear housing bearing(#19) installed in the housing.

Description	Order Number
#W2 & W8-wheel mount <sup>1</sup>	500136728

Table 5: Housing 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 numbers for each individual part.

Exploded View Item Number	31	32	33	Not Shown
Description	Shaft Kit	Key Kit	Nut Kit	Wire Ring Kit
#31-1-1/2" Tapered	500011216	500449105	See Table 3: Miscellaneous kits	-
#22-1-1/4" Tapered	500011300	500449101		-
#30-1-1/2" Straight	500011218	300339105		500449200
#28-35mm Tapered	500011310	500449104		-

Table 6: Shafts and related components kits

Exploded view item #28

Endcover kits come assembled with exploded view item numbers 10, 11, 26, &27. To order a relief valve for the valve cavity relief port endcovers, see Table 3: *Miscellaneous kits* 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	-	-	-

Table 7 Endcover kits

<sup>1</sup> This housing requires the use of two 7/8" o-ring port plugs. See Table 3: *Miscellaneous kits*



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