



MOTORS

Repair Instructions

RE 500/501 Series



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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RE 500/501 Exploded View

Exploded View

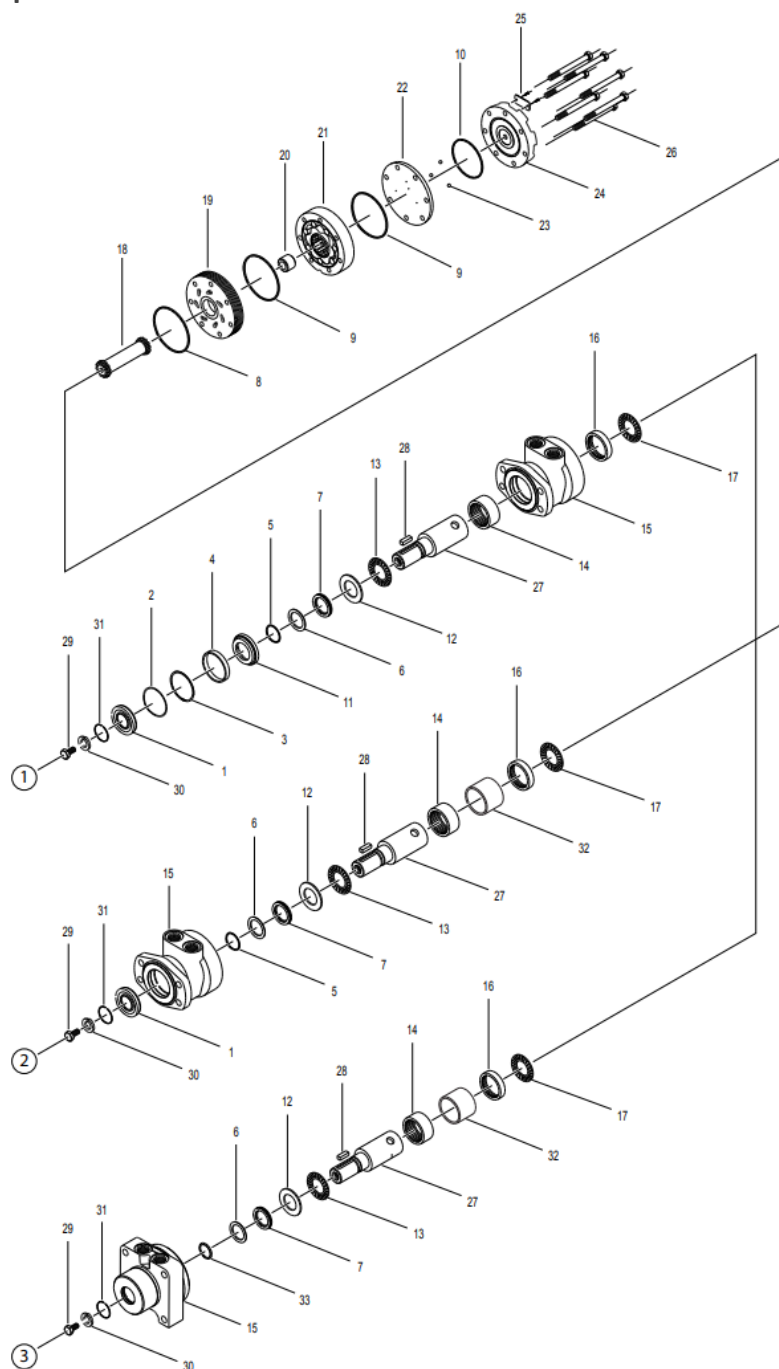


Table 1: Seal Options

| Description | Option Number |
|-----------------------------|---------------|
| Seal carrier design | 1 |
| Without seal carrier design | 2 |
| Excluder seal design | 3 |

Component List

| Description | Item Number | Description | Item Number |
|-----------------------|-------------|---------------------|-------------|
| Dust seal | 1 | Drive link | 18 |
| Split wire ring | 2 | Manifold | 19 |
| Metal backup shim | 3 | Drive link spacer | 20 |
| High pressure seal | 4 | Rotor assembly | 21 |
| Metal backup shim | 5 | Balance plate | 22 |
| Backup seal | 6 | Steel ball | 23 |
| Shaft seal | 7 | Endcover | 24 |
| Housing seal | 8 | ID tag assembly | 25 |
| Body seal | 9 | Assembly bolt | 26 |
| Endcover seal | 10 | Shaft | 27 |
| Seal carrier | 11 | Shaft key | 28 |
| Thrust washer | 12 | Shaft bolt | 29 |
| Front thrust bearing | 13 | Lock washer | 30 |
| Front housing bearing | 14 | Wire ring | 31 |
| Housing | 15 | Bearing spacer | 32 |
| Rear housing bearing | 16 | Excluder shaft seal | 33 |
| Rear thrust bearing | 17 | | |

Note 1: In December 2006 and again mid 2010, the 500 series incorporated design changes. Please refer to the Exploded View on page 6 to determine which design is being serviced and follow instructions for that design type.

Note 2: dimensions: mm [in]

All internal seals on products manufactured after July 1, 2016 are o-ring seals. Prior to this date the internal 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.

RE 500/501 Motor Section Disassembly

Same Instructions for Both Designs

1. Remove all shaft related components from shaft (27) (i.e. keys, wire rings, nuts).
 - a) To aid in reassembly of the motor, make a "V" shaped set of lines from the endcover (24) to the housing using either paint or a marker.
 - b) With shaft facing down, secure motor in vise by clamping on to housing (15).
2. Loosen and remove seven bolts (26) holding motor assembly together.
 - a) Remove endcover (24) and endcover seal (10).
 - b) Discard seal.
 - c) Remove balance plate (22) taking care not to drop the three steel balls (23) located in the three holes in the balance plate (22).
 - d) Remove rotor assembly (21), manifold (19), drive link spacer (20), drive link (18) and thrust bearing (17).

Note: Some motors do not use spacer.
 - e) Remove body seals (9) from rotor assembly (21) and housing seal (8) from housing (15) and discard seals.

Note: Compare old housing seal (8) to the two housing seals included in kit to determine which one to use.
 - f) Gently tap shaft (27) upward from housing (15) and remove through rear of housing and lay aside.

RE 500/501 Housing/Shaft with Seal Carrier Disassembly & Assembly

Design That Utilizes a Seal Carrier (11)

1. Remove housing (15) from vise and turn over.
 - a) Pry dust seal (1) from housing.
 - b) Push the seal carrier (11), thrust washer (12) and thrust bearing (13) down until they make contact with the roller bearing (14) located in the housing bore.
2. Remove wire ring (2), steel backup shim (3) and high-pressure seal (4) from inner bore groove with a small screwdriver.
 - a) Lift seal carrier (11), thrust washer (12) and thrust bearing (13) from the housing bore.
 - b) Using a small screwdriver, carefully pry shaft seal (7), backup seal (6), and metal backup shim (5) from seal carrier (11) and discard.
 - c) Lay seal carrier (11), thrust washer (12) and thrust bearing (13) aside.

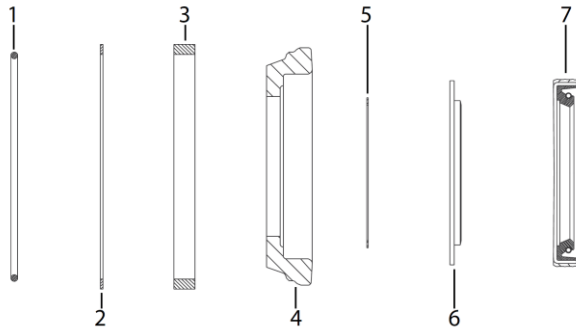
Note: If a new thrust washer (12) and seal carrier (11) is included in kit, old items may be discarded.

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 (27) on a clean flat surface with output end facing up.
 - a) Place thrust bearing (13).

Note: If thrust bearing has integral washer, make sure washer surface faces down.

- b) Then thrust washer (12) 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 (27) making sure that lip on seal faces until it contacts thrust washer (12).
- e) Remove plastic installation sleeve.
- f) Carefully install the backup seal (6) onto the shaft (27) 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 (11) onto the shaft (large end down) and carefully press the seal carrier (11) 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 |

4. With pilot side facing up, place housing (15) on spacers to raise housing approximately 6 [.25] above work surface.

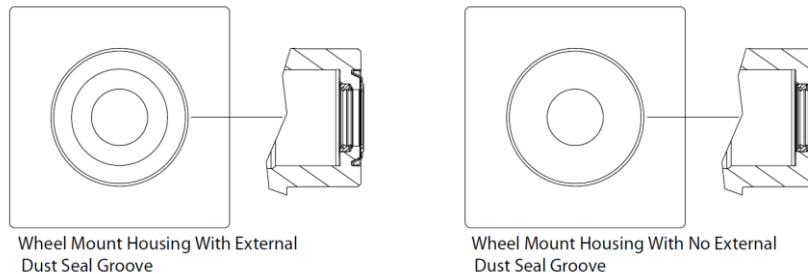
Note: Spacers should allow shaft to contact work surface.

- a) Place shaft/seal carrier assembly into housing (15).
 - 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 (18) with crowned splines goes into shaft end, install drive link (18) into shaft and tap lightly to seat the seal carrier against the wire ring (2).
 - b) Place thrust bearing (17) over drive link (18).
 - c) If seal carrier (11) is properly seated against wire ring (2), thrust bearing (17) will be flush with rear surface of housing.

RE 500/501 Housing/Shaft without Seal Carrier Disassembly & Assembly

Design That Does NOT Utilize A Seal Carrier (11)

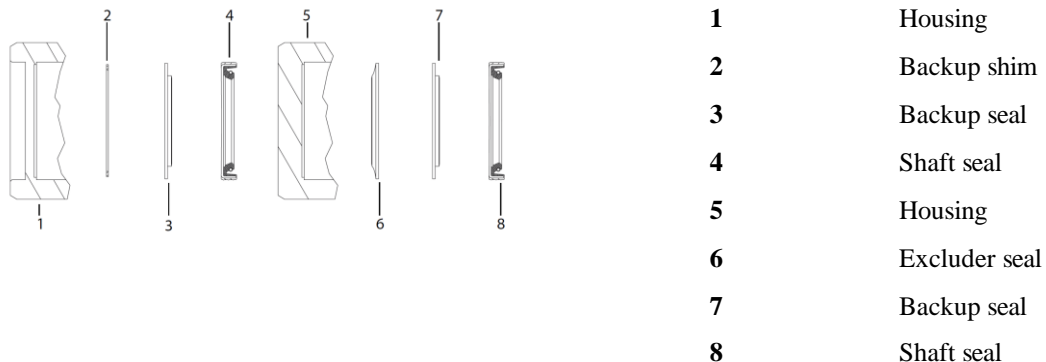
1. Position the housing (15) in vise and use a slide and hammer type bearing puller to remove the rear housing bearing (16).
 - a) Then remove the bearing spacer (32).
 - b) To remove the front housing bearing (14), flip the housing over and place a screwdriver or small chisel in between a roller in the bearing and rest it on the bottom of the bearing cage.
 - c) Strike the chisel or screwdriver with a hammer just until the cage stretches or chips enough to allow the rollers to fall out.
 - d) Clear away all rollers, then replace the housing in vise upside down and use the slide and hammer to remove bearing making sure that no finger of the puller is pulling on the weak point caused when removing the roller bearings.
 - e) Remove the thrust washer (12) and thrust bearing (13) and set aside.
 - f) Using a small screwdriver carefully pry the shaft seal (7), backup seal (6), and metal shim (5) from housing bore if present and discard.
 - g) Also remove excluder seal (33) if the motor design uses this seal and discard



2. Remove the housing from vise and turn over and pry the dust seal (1) from housing and discard (external dust seal is not used on models that use an internal excluder seal).

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 (15) in vice with the seven bolt assembly holes facing up.
 - a) If model uses an excluder seal (33), place it in the recess of housing, if not, place the metal shim (5) in recess.
 - b) Install the backup seal (6) into the housing (15) with the flat side down and the seal lip facing up.
 - c) Insert shaft seal (7) down into housing (15) making sure that lip on seal faces up.
 - d) Install thrust washer (12) into housing and using an arbor press, seat the shaft seal (7) into housing (15), then place the thrust bearing (13) into housing.

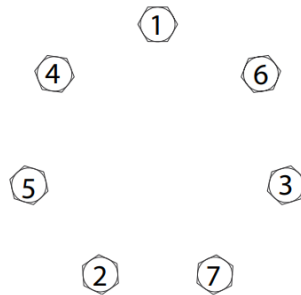


4. Place front housing bearing (14) onto housing and press bearing into housing to a depth of 60.1 [2.37] from the rear surface of the housing (15) to the top of the bearing.
 - a) Insert the bearing spacer (32) into the housing.
 - b) Place the rear housing bearing (16) onto the rear housing bore and press to a depth of 3.6 [.14] from the rear surface of the housing (15) to the top of the bearing (16).
 - c) Place the shaft (27) down into housing (15) and place thrust bearing (17) on top of shaft (27).
 - d) If shaft seals are properly seated against the housing (15), thrust bearing (17) will be flush with rear surface of housing.

RE 500/501 Motor Section Assembly

Same Instructions For Both Designs

1. Install housing seal (8) into groove in housing (15).
 - a) Place manifold (19) onto housing, (15) side with only seven holes facing housing (15).
 - b) Place body seals (9) in grooves in both sides of rotor (21).
 - c) Place rotor (21) onto manifold (19) with side of rotor with chamfer in splines facing manifold (19).
2. Install balance plate (22) onto rotor (21) making sure holes for steel balls (23) faces up.
 - a) Install three steel balls (23) in holes in balance plate (22).
 - b) Install endcover seal (10) into groove in endcover (24) and place endcover onto balance plate (22).
 - c) Install seven assembly bolts (26) and pre-torque to 13,6 Nm [10 ft. lbs.].
 - d) Using the bolt torque sequence shown below, finally torque all bolts to 67.8 Nm [50 ft. lbs.]



3. Remove motor from vise and place on work surface with shaft (27) facing up.
 - a) Making sure that lip on seal (1) faces up, place dust seal (1) over shaft (27).
 - b) Using a sleeve and a hammer, carefully drive dust seal (1) into place.

RE 500/501 Replacement Kits

Available Kits

Note: Refer to the Exploded View on page 6 for item numbers.

Table 2: Seal kits

| Description | Exploded View item Number | Qty. In Kit | Order Number |
|--------------------|---------------------------|-------------|--|
| Dust seal | 1 | 1 | 500444112B (Includes item numbers 1-10, 14, 16, &33) |
| Wire ring | 2 | 1 | |
| Metal backup shim | 3 | 1 | |
| High pressure seal | 4 | 1 | |
| Metal backup shim | 5 | 1 | |
| Polyamide seal | 6 | 2 | |
| Shaft seal | 7 | 2 | |
| Rear housing seal | 8 | 1 | |
| Body seal | 9 | 2 | |
| Endcover seal | 10 | 1 | |
| Excluder seal | 33 | 1 | |
| Seal Carrier | 11 | 1 | 500444003(Includes item numbers 11 &12) |
| Thrust washer | 12 | 1 | |

Table 3: Miscellaneous kits

| Description | Exploded View Item Number | Order Number |
|----------------------------------|---------------------------|--------------|
| Rear thrust bearing | 17 | 500018059 |
| Front housing bearing (1" wide) | 14 | 500018003 |
| Rear housing bearing (.5" wide) | 16 | 500018002 |
| Forward manifold (CCW or "0") | 19 | 500015006 |
| Reverse manifold (CW or "1") | 19 | 500015007 |
| Balance plate (3 balls included) | 22 | 500012001 |
| Steel ball | 23 | 500018048 |
| Endcover | 24 | 500016001 |
| Front thrust bearing | 13 | 500018252 |
| Dust seal | 1 | 500018006 |
| 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 | Not shown | 500449304 |
| 1.00-20 UNEF solid nut | Not shown | 500449303 |

| Description | Exploded View Item Number | Order Number |
|-----------------------|---------------------------|--------------|
| 1.00-20 UNEF lock nut | Not shown | 300339303P |
| Bearing spacer | 32 | 500018305 |

Rotors, drive links and spacers, and bolts

When changing motor displacements, a matching rotor and bolt set kit must be ordered. A new drive link kit may be necessary. Drive link spacers are included in drive link kits, but may also be ordered separately by using the drive link spacer kit number.

| Exploded View Item Number | 21 | 21 | 18 | 20 | 26 |
|---------------------------|--------------------|--------------------|----------------|-----------------------|--------------|
| Displacement | Standard Rotor Kit | Freeturn Rotor Kit | Drive Link Kit | Drive Link Spacer Kit | Bolt Set Kit |
| 120 | 500087005 | 500087008 | 500014009 | - | 500445006 |
| 160 | 500137005 | 500137011 | 500014009 | - | 500445006 |
| 200 | 500167004 | 500167011 | 500014009 | 500018075 | 500445012 |
| 230 | 500147002 | 500147004 | 500014009 | 500018185 | 500445014 |
| 260 | 500227000 | 500227004 | 500014039 | - | 500445014 |
| 300 | 500247005 | 500247011 | 500014007 | - | 500445018 |
| 350 | 500207000 | 500207004 | 500014042 | - | 500445026 |
| 375 | 500307005 | 500307011 | 500014008 | - | 500445024 |
| 470 | 500357003 | 500357005 | 500014042 | - | 500445026 |
| 540 | 500407005 | 500407011 | 500014044 | - | 500445032 |
| 750 | 500607005 | 500607011 | 500014047 | - | 500445045 |

Housing kits

Exploded view item #15

Standard housing kits include the front bearing (#14) and the rear bearing(#16) installed in the housing.

| Description | Order Number |
|---|--------------|
| #F31- 4-hole without pilot & RS 4-hole bolt pattern | 500130223 |
| #W38- wheel mount with 1/2" BSP.F | 500130523 |
| #A38- 4-hole SAE "A" style with 1/2" BSP.F | 500130623 |
| #W31- wheel mount with 7/8" o-ring | 500130723 |
| #A31- 4-hole SAE "A" style with 7/8" o-ring | 500130823 |
| #A11- 2-hole SAE "A" style with 7/8" o-ring | 500131623 |
| #A18- 2-hole SAE "A" style with 1/2" BSP.F | 500131723 |
| #A51- 6-hole SAE "A" style with 7/8" o-ring | 500131823 |
| #A58- 6-hole SAE "A" style with 1/2" BSP.F | 500131923 |
| #W38- wheel mount with relief port with 1/2" BSP.F | 500133523 |

| Description | Order Number |
|--|--------------|
| #A38- 4-hole SAE "A" with relief port with 1/2" BSP.F | 500133623 |
| #W31- wheel mount with relief port with 7/8" o-ring | 500133723 |
| #A31- 4-hole SAE "A" with valve cavity with 7/8" o- ring | 500133823 |
| #A51- 6-hole SAE "A" with valve cavity with 7/8" o- ring | 500134823 |
| #A58- 6-hole SAE "A" with valve cavity with 1/2" BSP.F | 500134923 |

Shafts and related components kits

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

| Exploded View Item Number | 27 | 28 | Not Shown | 29 | 30 | 31 |
|-----------------------------------|-----------|-----------|---------------------------------|-----------|------------|---------------|
| Description | Shaft Kit | Key Kit | Nut Kit | Bolt Kit | Washer Kit | Wire Ring Kit |
| #02- 6-B Spline | 500011600 | - | See Table 3: Miscellaneous kits | - | - | - |
| #22- 1-1/4" Tapered | 500011300 | 500449101 | | - | - | - |
| #20- 1-1/4" Straight | 500011200 | 500449102 | | 500449301 | 500449302 | 500449201 |
| #23- 14 Tooth spline | 500011101 | - | | - | - | 500449201 |
| #10- 1" Straight | 500011201 | 500449100 | | - | - | - |
| #12- 25mm Straight | 500011109 | 500449104 | | - | - | - |
| #24- 19 Tooth spline | 500011102 | - | | - | - | 500449201 |
| #21- 32mm Straight | 500011203 | 500449103 | | - | - | 500449201 |
| #19- 1" Straight extended | 500011202 | 500449100 | | - | - | - |
| #01- 13 Tooth spline | 500011114 | - | | - | - | - |
| #29- 12 Tooth spline (BK) | 500011116 | - | | - | - | - |
| #26- 1-1/4" Straight non-annealed | 500011214 | - | | - | - | - |



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