

**SERVICE INSTRUCTIONS FOR THE RE [520 & 521] SERIES MOTORS**

For Use With Seal Kits: 500444001 &amp; 500444002

dimensions: mm [in]

**NOTE:** In December 2006, the 520 Series incorporated a design change. These instructions will cover both designs. Refer to the exploded view drawing to determine which design is being repaired and follow the appropriate instructions.

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.

**Motor Section Disassembly (Same Instructions For Both Designs)**

- A)** Remove all shaft related components from shaft (27) (i.e. keys, wire rings, nuts). 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. With shaft facing down, secure motor in vise by clamping on to housing (16).
- B)** Loosen and remove seven bolts (26) holding motor assembly together. Remove endcover (24) and endcover seal (10). Discard seal. Remove balance plate (22) taking care not to drop the three steel balls (23) located in the three holes in the balance plate (22). Remove rotor assembly (21), manifold (20), drive link spacer (19) (NOTE: Some motors do not use spacer), drive link (18) and thrust bearing (15). Remove body seals (9) from rotor assembly (21) and housing seal (8) from housing (16) and discard seals. (NOTE: Compare old housing seal (8) to the two housing seals included in kit to determine which one to use.) Gently tap shaft (27) upward from housing (16) and remove through rear of housing and lay aside.

**Housing/Shaft Disassembly And Assembly (Design That Utilizes A Seal Carrier (13))**

- C)** Turn housing over and remove retaining snap ring (11) from inner core of housing. Turn housing over again. Using a drift punch through the rear of the housing, tap against the inner race of the 72mm bearing (12) to remove the bearing through the top of the housing. Pry dust seal (1) from bearing (12). Then turn housing over again and push the seal carrier (13), thrust washer (14) and thrust bearing (15) down until you can get to the wire ring (2).
- D)** Remove wire ring (2), steel backup shim (3) and high pressure seal (4) from inner bore groove with a small screwdriver. Lift the seal carrier (13), thrust washer (14) and thrust bearing (15) from the housing bore. Carefully pry shaft seal (7), backup seal (6), and metal backup shim (5) from seal carrier (13) and discard. Lay seal carrier (13), thrust washer (14) and thrust bearing (15) aside. (NOTE: If a new thrust washer (14) and seal carrier (13) is included in kit, old items may be discarded).

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.

- E)** Place shaft (27) on a clean flat surface with output end facing up. Place thrust bearing (15) (NOTE: If thrust bearing has integral washer, make sure washer surface faces down) over the shaft. Then thrust washer (14) on shaft (See Technical Bulletin PI444004 to determine correct thrust washer to use). 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. Slide shaft seal (7) down onto shaft (27) making sure that lip on seal faces down (See Figure 1 for correct seal orientation) until it contacts thrust washer (12). Remove plastic installation sleeve. Carefully install the backup seal (6) onto the shaft (27) with the flat side up and the seal lip facing the shaft seal (7). Place the metal backup shim (5) onto the shaft and against the backup seal (6). Place the seal carrier (13) onto the shaft (large end down) and carefully press the seal carrier (13) down onto the seal assembly using an arbor press and sleeve to compress the seal into the carrier.
- F)** With pilot side facing up, place housing (16) on spacers to raise housing approximately 6,4 [.250] above work surface (NOTE: Spacers should allow shaft to contact work surface). Place shaft/seal carrier assembly into housing (16). Install high pressure seal (4) into groove in housing. 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. While maintaining bow in shim, start the shim into the groove and use a small screwdriver to push the shim into groove. Install wire ring (2) into the groove, making sure that the ends are butted.
- G)** While holding shaft into housing, place housing/shaft assembly in vise with shaft end down. 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). Place thrust bearing (15) over drive link (18). If seal carrier (13) is properly seated against wire ring (2), thrust bearing (15) will be flush with rear surface of housing.

**Housing/Shaft Disassembly And Assembly (Design That Does NOT Utilizes A Seal Carrier (13))**

- H)** Position the housing (16) in vise and use a slide and hammer type bearing puller to remove the rear housing bearing (17). Remove the thrust washer (14) and thrust bearing (15) and set aside. Using a small screwdriver carefully pry the shaft seal (7), backup seal (6) and metal shim (5) from housing bore and discard.
- I)** Turn housing over and remove retaining snap ring (11) from inner core of housing. Turn housing over again. Using a drift punch through the rear of the housing, tap against the inner race of the 72mm bearing (12) to remove the bearing through the top of the housing. Pry dust seal (1) from bearing (12) and discard.

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.

- J) Place housing (16) in vice with the seven bolt assembly holes facing up. Place metal shim (5) in the smallest diameter recess in the housing (16). Install the backup seal (6) into the housing (16) with the flat side down and the seal lip facing up. Insert shaft seal (7) down into housing (16) making sure that lip on seal faces up (See Figure 2 for correct seal orientation). Install thrust washer (14) into housing and using an arbor press, seat the shaft seal (7) into housing (16), then place the thrust bearing (15) into housing.
- K) Place the rear housing bearing (17) onto the rear housing bore and press to a depth of 3,6 [.14] from the rear surface of the housing (16) to the top of the bearing (17). Place the shaft (27) down into housing (16) and place thrust bearing (15) on top of shaft (27). If shaft seals are properly seated against the housing (16), thrust bearing (15) will be flush with rear surface of housing.

**Motor Section Assembly (Same Instructions For Both Designs)**

- L) Install housing seal (8) into groove in housing (16). Place manifold (20) onto housing (16) with side with only seven holes facing housing (16). Place body seals (9) in grooves in both sides of rotor (21). Place rotor (21) onto manifold (20) with side of rotor with chamfer in splines facing manifold (20).
- M) Install balance plate (22) onto rotor (21) making sure holes for steel balls (23) faces up. Install three steel balls (23) in holes in balance plate (22). Install endcover seal (10) into groove in endcover (24) and place endcover onto balance plate (22). Install seven assembly bolts (26) and pre-torque to 10 ft. lbs. Using the bolt torque sequence shown in Figure 3, final torque all bolts to 67,8 Nm [50 ft. lbs.]
- N) Remove motor from vise and place on work surface with shaft (27) facing up. Place 72mm bearing (12)(Making sure that side of bearing with internal retaining ring faces down) over the shaft (27). Using a sleeve and hammer, carefully drive bearing into housing making sure the top of the bearing falls below the groove in the housing for retaining ring installation. **(Caution: Driving the bearing down with excessive force may cause seal carrier to interfere with bearing performance. This could lead to product overheating and may shorten the life of bearing and motor. Bearing only need be tapped into place.)** Install the retaining ring (11) in the groove in the housing, making sure that the ring snaps into place. Place dust seal (1) over shaft (27) making sure side with lip faces up. Using a sleeve and hammer, carefully drive dust seal into place.

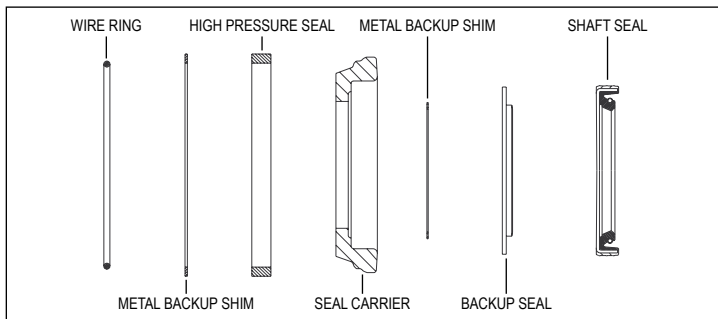


FIGURE 1

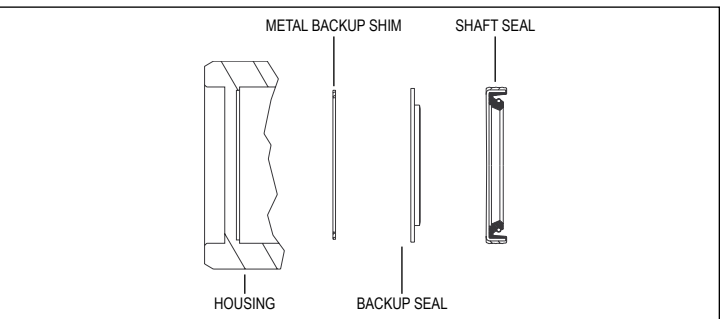


FIGURE 2

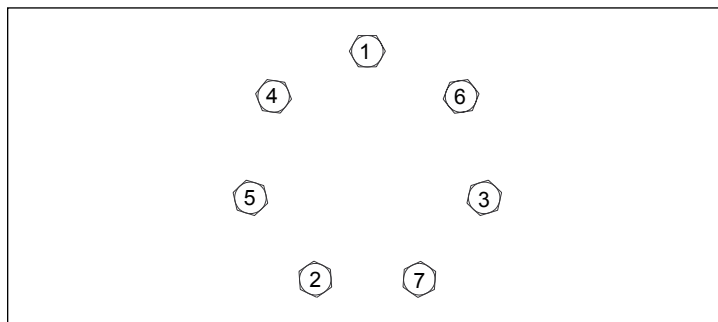


FIGURE 3

**EXPLODED VIEW PARTS DESCRIPTION**

1. *† Dust Seal	12. 72mm Bearing	23. Steel Balls (3)
2. *† Split Wire Ring	13. * Seal Carrier	24. Endcover
3. *† Metal Backup Shim	14. * Thrust Washer	25. I.D. Tag Assembly
4. *† High Pressure Seal	15. Thrust Bearing	26. Assembly Bolts (7)
5. *† Metal Backup Shim	16. Housing	27. Shaft
6. *† Backup Seal (2)	17. Rear Housing Bearing	28. Shaft Key
7. *† Shaft Seal (2)	18. Drive Link	29. Shaft Nut
8. *† Housing Seal	19. Drive Link Spacer	
9. *† Body Seals (2)	20. Manifold	
10. *† Endcover Seal	21. Rotor Assembly	* Contained in Seal Kit 500444001
11. Retaining Snap Ring	22. Balance Plate	† Contained in Seal Kit 500444002

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

