Repair Instructions
HB 310 Series

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Chapter

1

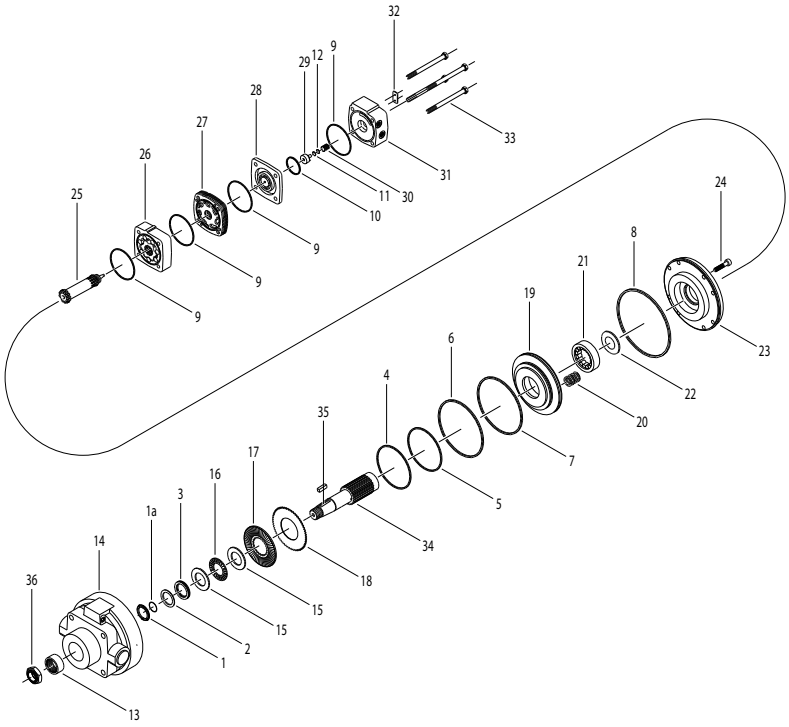
HB 310 Series Diagram

Topics:

- *HB 310 Series Exploded View*

HB 310 Series Exploded View

Exploded View Diagram



Component List

Description	Item Number
Metal backup ring	1
Metal backup shim	1a
Backup seal	2
Shaft seal	3
Small o-ring seal	4
Small teflon seal	5
Large o-ring seal	6
Large teflon seal	7
O-ring seal	8
Body seal	9
Commutator seal	10
Piston o-ring seal	11
Piston teflon seal	12
Front shaft bearing	13
Front housing	14

Description	Item Number
Thrust washer	15
Thrust bearing	16
Friction disk	17
Disk stamping	18
Piston	19
Spring	20
Rear shaft bearing	21
Spacer shim	22
Rear housing	23
Capscrew	24
Drive link	25
Rotor assembly	26
Manifold	27
Commutator assembly	28
Piston	29
Piston spring	30
Endcover	31
ID tag	32
Assembly bolt	33
Shaft	34
Shaft key	35
Shaft nut	36

Chapter 2

HB 310 Series Service Instructions

Topics:

- *HB 310 Series Seal Kit Installation*

HB 310 Series Seal Kit Installation

1. Remove all shaft related components from shaft (34) (i.e. keys, nuts). To aid in reassembly of the motor, make a "V" shaped set of lines from the endcover (31) to the housing (14) using either paint or a marker. With shaft (34) facing down, secure motor in vise by clamping on to housing (14). Loosen and remove four bolts (33) holding motor assembly together. Remove endcover (31) from motor making sure not to drop endcover piston (29). Using needle nose pliers or two small screwdrivers, lift endcover piston (29) out of endcover (31). Remove white Teflon seal (11) and o-ring seal (12) from endcover piston (29) and discard. Remove the piston spring (30) from endcover (31) and lay aside.
2. Lift commutator container and commutator (28) from motor and lay aside. Place commutator on a flat, clean surface with the seal (10) facing up. Place the tip of a small screwdriver on the seal (10) and gently tap until opposite side of seal lifts from groove. Remove seal (10) and discard.
3. Remove manifold (27) and rotor assembly (26) from motor. Remove all seals (9) from components and discard. Remove drive link (25) from motor and lay aside.
4. Put the housing assembly into an arbor press with the shaft facing down. Lower the press to apply downward pressue on the rear housing (23) and lock the press in place. Loosen and remove the eight capscrews (24) holding the rear housing (23) to the front housing (14). Slowly release the press to allow spring pressure to push the rear housing (23) from the front housing (14). Remove the rear housing (23) and lay aside.

   Note: Bearing (21) and spacer shim(s) (22) may fall out of rear housing (23).
5. Remove springs (20) from front housing (14) and lay aside. Remove housing (14) from arbor press and place on a clean, flat surface with output end of shaft (34) facing up. To remove piston (19), friction disks (17) and disk stampings (18), firmly grasp output end of shaft with a rag. Raise housing assembly a few inches above work surface and firmly strike housing assembly on work surface until piston and disks drop fromhousing assembly. Lay piston (19) and disks (17 & 18) aside. Remove shaft (34) from housing (14) and lay aside.
6. Remove two thrust washers (15) and thrust bearing (16) from front housing (14) and lay aside. Pry shaft seal (3) and backup seal (2) from front housing (14) and discard. Remove metal backup ring (1) and shim (1a) from front housing (14). Unless the front shaft bearing (13) is damaged, removing it from the front housing (14) is not necessary.

   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 in clean oil prior to installation.
7. Place shaft (34) on clean work surface with output end of shaft facing up. Place one thrust washer (15) down onto shaft followed by thrust bearing (16) and remaining thrust washer (15). Place shaft seal (3) down onto shaft (34) making sure that lip on seal faces thrust washer (15). See below for shaft component stack up. Place backup seal (2) onto shaft making sure that lip on seal faces down and fits into recess in shaft seal (3). Place metal backup shim (1a) onto shaft then place metal backup ring onto shaft making sure that large O.D. side faces shim (1a).

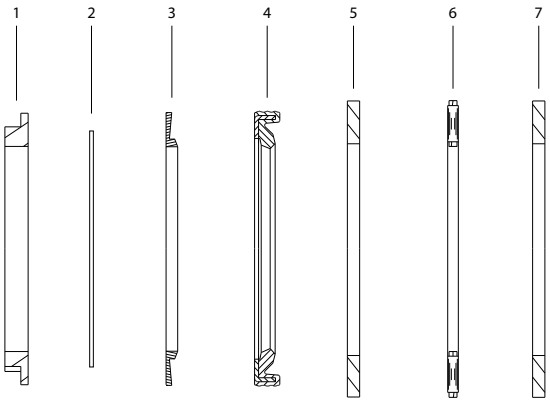


Figure 1: HB 310 Series Shaft Stack Up

a. Metal backup ring

b. Metal backup shim
c. Backup seal
d. Shaft seal
e. Thrust washer
f. Thrust bearing
g. Thrust washer

8. With pilot of front housing (14) facing up, lower front housing (14) over shaft and allow front housing (14) to rest on work surface. Grasping output end of shaft (34), place housing/shaft assembly in vise with output end of shaft (34) facing down. Insert a punch down into the center of the shaft and use a hammer to gently tap downwards on the shaft (34) to seat the shaft seal (3) into the front housing (14). Remove punch. Place one disk stamping (18) over shaft O.D. splines and down into front housing (14) followed by one friction disk (17). Repeat process, alternating disks until all disks are installed into housing.

9. Install small o-ring seal (4) and large o-ring seal (6) into corresponding grooves in piston (19). Install small seal (5) and large seal (7) in corresponding grooves over o-ring seals. Thoroughly coat seals and sealing surfaces of housing (14) with clean oil. With large O.D. side of piston (19) facing up, install piston (19) into housing (14) and evenly press piston down making sure not to pinch Teflon seals. If friction disks and disk stampings are going to be replaced, the stack up on the new disks must be between 15.2 and 15.7 [.600 and .610]. See below for measuring reference.

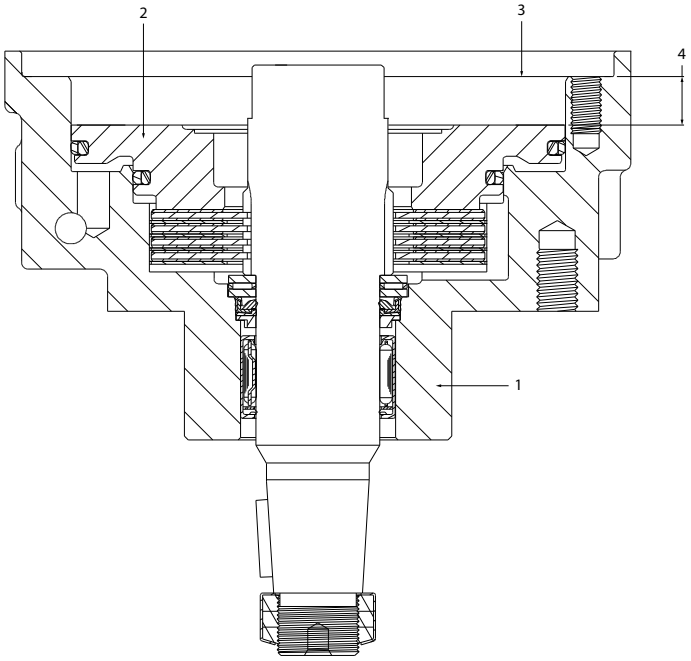


Figure 2: HB 310 Series Brake Component Stackup Measurement

a. Front housing
b. Piston
c. Rear housing mounting surface
d. Stackup distance must be between 15.2 [.600] - 15.6 [.615]

10. Install 25 springs (20) on top of piston. Install o-ring seal (8) in groove in rear surface of housing (14). If rear shaft bearing (21) and spacer shim(s) (22) came out of rear housing (23), reinstall at this time by placing spacer shim(s) (22) into rear housing (23) first followed by rear shaft bearing (21). Place rear housing (23) onto front housing (14) lining up bolt holes. While holding motor assembly together, remove motor assembly from vice and place in arbor press. Press down on rear housing (23) until it contacts front housing (14) and lock press. Install eight capscrews (24) and torque to 61 Nm [45 lb-ft].

11. Insert the drive link (25) into the shaft with the tapered end facing up. Place a body seal (9) into the groove in the face oth the rotor assembly (26). With the seal side of the rotor assembly (26) facing the rear housing (23), line up

the splines of the drive link (25) and the rotor assembly (26) and lower the rotor assembly onto the rear housing (23).

12. Place a body seal (9) into the groove in each face of the manifold (27). Lift the drive link (25) approximately .100 and place the tip on a small screwdriver under the disk-shaped portion of the drive llink to hold it up. Making sure that the notch in the manifold is aligned with the tab on the rotor and that the side with the largest holes faces down, lower the manifold (27) onto the motor and engage the disk shaped protion of the drive link (25) into the groove in the manifold (27). See below for proper drive link and manifold orientation. Remove the screwdriver and lower the manifold (27). If the disk is engaged in the groove, the end of the drive link will protrude above the surface of the manifold. If it doesn't, remove manifold and repeat this step.

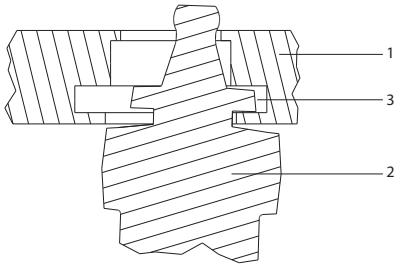


Figure 3: Manifold and Drive Link Configuration

- **a.** Manifold
- **b.** Drive link
- **c.** Drive link properly engaged in manifold groove

13. Install the commutator seal (10) into the commutator (28) with the metal side facing up making sure to use the same commutator seal that was removed in step two. See below for commutator seal variations. Use finger pressure to press the seal down flush with the surface of the commutator. Place the commutator container (28) onto the manifold (27) and then place the commutator onto the protruding end of the drive link (25) making sure that the seal side faces up.

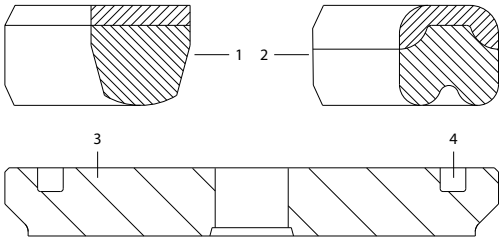


Figure 4: Commutator Seal Variations

- **a.** Commutator seal with flat metal top and rounded rubber bottom
- **b.** Commutator seal with rounded metal top and groove in rubber bottom
- **c.** Commutator
- **d.** Groove in commutator (insert rubber part of seal in groove first)

14. Install the remaining body seal (9) in the groove in the face of the endcover (31). Install the poston spring (30) into the endcover (31), then the white seal (12), followed by the O-rign seal (11). Lining up the alignment pin, press the piston (29) into the endcover (31). While holding the endcover piston (29) into the endcover (31), lower the endcover assembly onto the motor.

15. Install the four assembly bolts (33) and pre-torque to 13.6 Nm [10 lb-ft]. Final torque all bolts to 69.8 ± 7.5 Nm [51.5 ± 5.5 lb-ft].

Chapter 3

HB 310 Series Parts Listing

Topics:

- *HB 310 Series Replacement Kits*

HB 310 Series Replacement Kits

Available Parts Kits

Note: Refer to the *HB 310 Series Exploded View* for item numbers.

Table 1: Seal Kit(s)

Description	Exploded View Item Number	Qty. In Kit	Order Number
Metal backup shim	1	1	300333752 (Includes item numbers 1-12)
Backup seal	2	1	
Shaft seal	3	1	
Small o-ring piston seal	4	1	
Small Teflon piston seal	5	1	
Large o-ring piston seal	6	1	
Large Teflon piston seal	7	1	
O-ring seal	8	1	
Body seal	9	4	
Commutator seal	10	1	
Piston o-ring seal	11	1	
Piston Teflon seal	12	1	

Table 2: Miscellaneous Kit(s)

Description	Exploded View Item Number	Qty. In Kit	Order Number
Front shaft bearing	13	1	500018203
Thrust washer	15	1	300018002
Thrust bearing	16	1	500118003
Friction disks and stampings	17 & 18	5 stampings, 4 disks	300018088
Piston	19	1	710018038
Spring	20	25	910018014
Rear shaft bearing	21	1	910018011
Spacer shim	22	3	300018068
Capscrew	24	8	200018074
Manifold	27	1	300015008
Commutator assembly	28	1	300012013
Endcover piston	29	1	300018056
Piston spring	30	1	300018059

Description	Exploded View Item Number	Qty. In Kit	Order Number
1.00-20 UNEF Slotted nut	36	1	500449304
1.00-20 UNEF Solid nut	36	1	500449303
1.00-20 UNEF Lock nut	36	1	300339303P
1.125-18 UNEF Slotted nut	36	1	700018038
1.125-18 UNEF Solid nut	36	1	700018054
1000 PSI relief valve	Not shown	1	500018228
2000 PSI relief valve	Not shown	1	500018231
3000 PSI relief valve	Not shown	1	500018221

Table 3: Rotorset, Drive Link and Bolt Kit(s)

Exploded View Item Number	26	26	25	33	33
Displacement	**Standard Rotor Kit**	**Freeturn Rotor Kit**	**Drive Link Kit**	**Bolt Set Kit (7)**	**Bolt Set Kit (7) Offset Ports**
050	300332003	300332003F	300014028	300334005	300334004L
080	300332004	300332004F	300014028	300334008	300334012
090	300332005	300332005F	300014028	300334008	300334014
110	300332006	300332006F	300014029	300334010	300334014
125	300332008	300332008F	300014029	300334003L	300334018
160	300332010	300332010F	300014030	300334012	300334012L
200	300332012	300332012F	300014030	300334014	300335110
250	300332014	300332014F	300014027	300334018	300334018L
300	300332018	300332018F	300014027	300335014	300335016
320	300332020	300332020F	300014031	300334024	300334024L
400	300332024	300332024F	300014031	300334024	300334024L

Table 4: Housing Kits

Description	Exploded View Item Number	Housing Kit
W2 or W8 housing	14	300130046
Rear housing	23	300013027

Table 5: Shaft and Related Components Kit(s)

Exploded View Item Number	34	35	Not Shown	Not Shown	Not Shown
Description	**Shaft Kit**	**Key Kit**	**Wire Ring Kit**	**Washer Kit**	**Bolt Kit**
22 - 1-1/4" Tapered	300110063	300339101	N/A	N/A	N/A

Exploded View Item Number	34	35	Not Shown	Not Shown	Not Shown
Description	**Shaft Kit**	**Key Kit**	**Wire Ring Kit**	**Washer Kit**	**Bolt Kit**
31 - 1-1/2" Tapered	300110064	500449102	N/A	N/A	N/A
28 - 35mm Tapered	300110079	500449104	N/A	N/A	N/A
21 - 32mm Straight	300110067	300339103	500449201	N/A	N/A
20 - 1-1/4" Straight	300110074	300339101	500449201	300339302	300339301
23 - 1-1/4" Spline (14 tooth)	300110075	N/A	500449201	N/A	N/A

Table 6: Endcover Kits (Exploded View Item Number 31)

Port Number	Description	Standard Endcover Kit	Valve Cavity Endcover Kit
1	7/8-14 UNF Rear ports	300160007	300160007R
1	7/8-14 UNF Offset ports	300160006	N/A
2	G ½ Rear ports	300160003	N/A
2	G ½ Offset ports	300160008	N/A
3	G ½ Offset manifold ports	300160009	N/A
5	9/16-18 UNF	300160000	300160000R
6	1 1/16-12 UN 180° Opposed	300160001	N/A
7	G ½ 180° Opposed	300160002	N/A