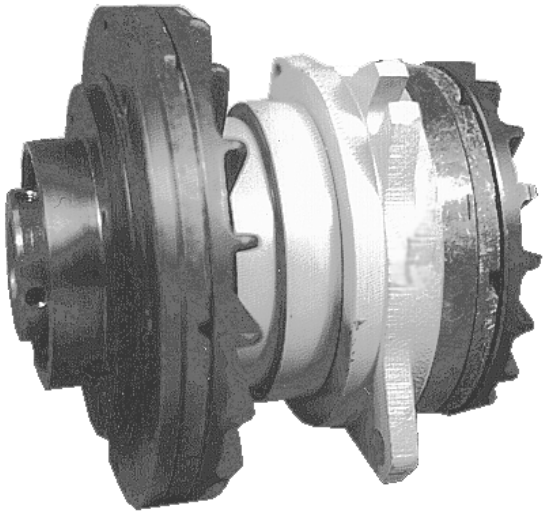
nexen®

AIR CHAMP® PRODUCTS

User Manual



Townsend Pilot Model HWCB

FORM NO. L-20270-D-0501

In accordance with Nexen's established policy of constant product improvement, the specifications contained in this manual are subject to change without notice. Technical data listed in this manual are based on the latest information available at the time of printing and are also subject to change without notice.

Technical Support:
800-843-7445
(651) 484-5900

www.nexengroup.com

WARNING

Read this manual carefully before installation and operation.

Follow Nexen's instructions and integrate this unit into your system with care.

This unit should be installed, operated and maintained by qualified personnel ONLY.

Improper installation can damage your system or cause injury or death.

Comply with all applicable codes.

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Vadnais Heights, Minnesota 55127

ISO 9001 Certified

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INTRODUCTION

Read this manual carefully, making full use of its explanations and instructions. The “Know How” of safe, continuous, trouble-free operation depends on the degree of your understanding of the system and your willingness to keep all components in proper operating condition. Pay particular attention to all NOTES, CAUTIONS, and WARNINGS to avoid the risk of personal injury or property damage. It is important to understand that these NOTES, CAUTIONS, and WARNINGS are not exhaustive. Nexen cannot possibly know or evaluate all conceivable methods in which service may be performed, or the possible hazardous consequences of each method. Accordingly, anyone who uses a procedure that is not recommended by Nexen must first satisfy themselves that neither their safety or the safety of the product will be jeopardized by the service method selected.

WARNING

This unit has rotating parts. A guard that will not restrict the flow of cooling air around the unit must be used if the unit is installed where injury to an operator could occur, as stated in the Occupational Safety and Health Act (OSHA), Standard 29 CFR 1910, Section 1910.219K.

The Nexen Air Champ Clutch-Brake is an Air Champ Clutch and an Air Champ Brake combined into a single unit. Two separate air inlets provide independent clutching and braking action.

Because heat from both the clutch and brake are absorbed within the unit during engagement, caution must be used when a clutch-brake is applied on high speed, high cyclic applications. If heat generated from the clutching and braking of the clutch-brake becomes great enough that the surface temperature of the unit is 180° F [82.3° C] or higher, the clutch-brake may experience excessive facing wear and a reduction in bearing and o-ring life. The clutch-brake must be mounted on the driven shaft.

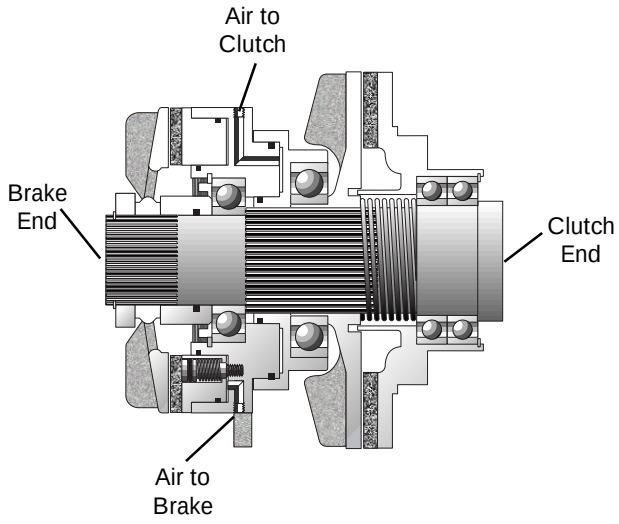

FIGURE 1

INSTALLATION

PILOT MOUNT CLUTCH-BRAKE

1. Secure the customer supplied sheave or sprocket to the clutch-brake.

2. Insert the first Key (Item 30) into the shaft (See Figure 2).

3. Slide the clutch-brake onto the shaft and Key.

4. Insert the second Key (Item 30) (See Figure 2).

5. Tighten the Set Screws (Items 27 and 48) (See Figure 2).

   NOTE: If a bushing for smaller diameter shafts is required, use a bushing on both ends of the clutch-brake.

6. Secure the clutch-brake.

   a. Align the air inlet ports to a six o'clock down position to allow condensation to drain out during exhaust of air.

   b. Fasten one of the ears of the clutch-brake to a fixed member of the machine.

   NOTE: The Air Chamber-Piston (Item 7) floats laterally approximately 1/16 In. [1.6 mm] during operation. Make sure securing the pin allows for 1/16-1/8 In. [1.6-3.2 mm] movement of the Air Chamber-Piston.

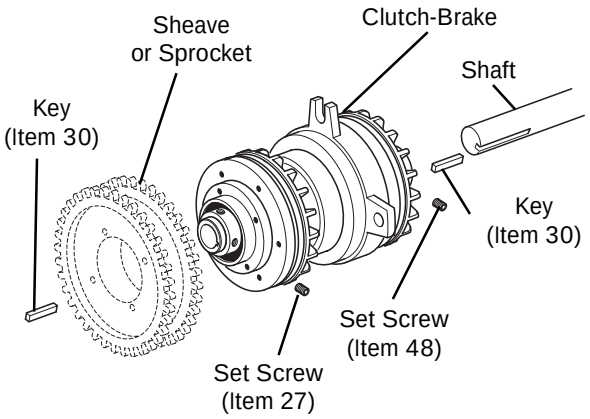

FIGURE 2

AIR CONNECTIONS

NOTE: For quick response, Nexen recommends a quick exhaust valve and short air lines between the Control Valves and the clutch/brake. Align the inlet ports to a down position to allow condensation to drain out of the air chambers.

4-WAY CONTROL VALVE

1. If the brake is to be set when the solenoid is de-energized, connect the port marked 2 to the brake and the port marked 4 to the clutch (See Figure 3).

2. Connect the air supply line to the inlet port marked 1 (See Figure 3).

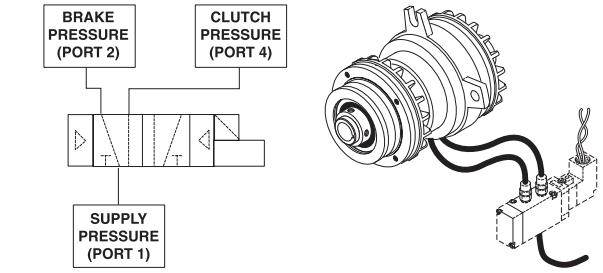

FIGURE 3

5-WAY CONTROL VALVE

1. If the brake is to be set and the clutch is to be OFF when the solenoid is de-energized, connect the port marked 4 to the brake and the port marked 2 to the clutch (See Figure 4).

2. Connect the brake air supply line to the port marked 5 and the clutch air supply line to the port marked 3 (See Figure 4).

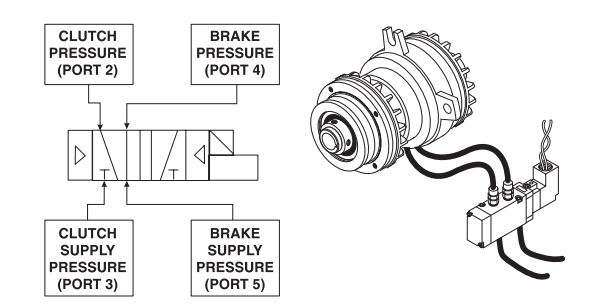

FIGURE 4

3-WAY CONTROL VALVES

1. Connect a 3-Way N.O. Control into the brake inlet port and a 3-Way N.C. control into the clutch inlet port (See Figure 5).

2. Connect an air supply line to the inlet port (marked IN) on the top of the 3-Way N.O. Control and an air supply line to the inlet port (marked IN) on the side of the 3-Way N.C. Control (See Figure 5).

   NOTE: When a 3-Way N.O. Control is de-energized, air flows directly to the brake. When a 3-Way N.O. Control is energized, air exhausts from the brake.

   When a 3-Way N.C. Control is de-energized, air exhausts from the clutch. When a 3-Way N.C. Control is energized, air flows to the clutch.

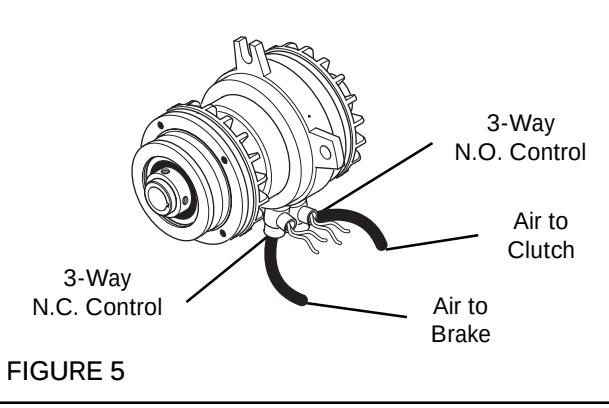

FIGURE 5

LUBRICATION

NOTE: Pneumatically actuated devices require clean, pressure regulated, and lubricated air for maximum performance and long life. The most effective and economical way to lubricate Nexen Clutches is with an Air Line Lubricator, which injects oil into the pressurized air, forcing an oil mist into the air chamber.

Locate the lubricator above and within ten feet of the clutch-brake, and use a low viscosity oil such as SAE-10.

Synthetic lubricants are not recommended.

LUBRICATOR DRIP RATE SETTINGS

NOTE: These settings are for Nexen supplied lubricators. If you are not using a Nexen lubricator, calibration must replicate the following procedure.

1. Close and disconnect the air line from the unit.
2. Turn the Lubricator Adjustment Knob counter-clockwise three complete turns.
3. Open the air line.
4. Close the air line to the unit when a drop of oil forms in the Lubricator Sight Gage.
5. Connect the air line to the unit.
6. Turn the Lubricator Adjustment Knob clockwise until closed.
7. Turn the Lubricator Adjustment Knob counter-clockwise one-third turn.
8. Open the air line to the unit.

TROUBLESHOOTING

PROBLEM	PROBABLE CAUSE	SOLUTION
Failure to engage	Air not getting to the clutch-brake due to a control valve malfunction.	Check for control valve malfunction and replace valve if necessary.
	Air leaks.	Replace air lines.
	Lack of lubrication on the hub spline or in the air chamber.	Lubricate hub spline and/or air chamber.
	Rigid piping instead of flexible air lines.	Replace rigid piping with flexible air lines.
Failure to disengage	Unexhausted air due to a control valve malfunction.	Check for control valve malfunction and replace valve if necessary.
	Friction lock due to a lack of lubrication on the hub spline or in the air chamber.	Lubricate hub spline and/or air chamber.
	Rigid piping instead of flexible air lines.	Replace air lines with flexible air line tubing.
	Weak or broken springs.	Replace springs.
Loss of torque	Air leaks.	Replace air lines.
	Overheating (fading).	Check manufacturing specifications to be certain clutch-brake is suitable for the application.
Overlap or simultaneous engagement of the clutch and brake when switching Overlap can be verified by motor amperage readings when cycling with the clutch-brake versus clutch only (brake disconnected). Higher draw with the clutch-brake indicates overlap.	Inadequate controls.	Install controls meeting the specifications of clutch-brake.
	Air line too long between the valve and the clutch-brake.	Shorten air line between the valve and clutch-brake.
	Air pressure too high.	Reduce the air pressure.
	Lack of quick exhaust valves.	Install quick exhaust valves.

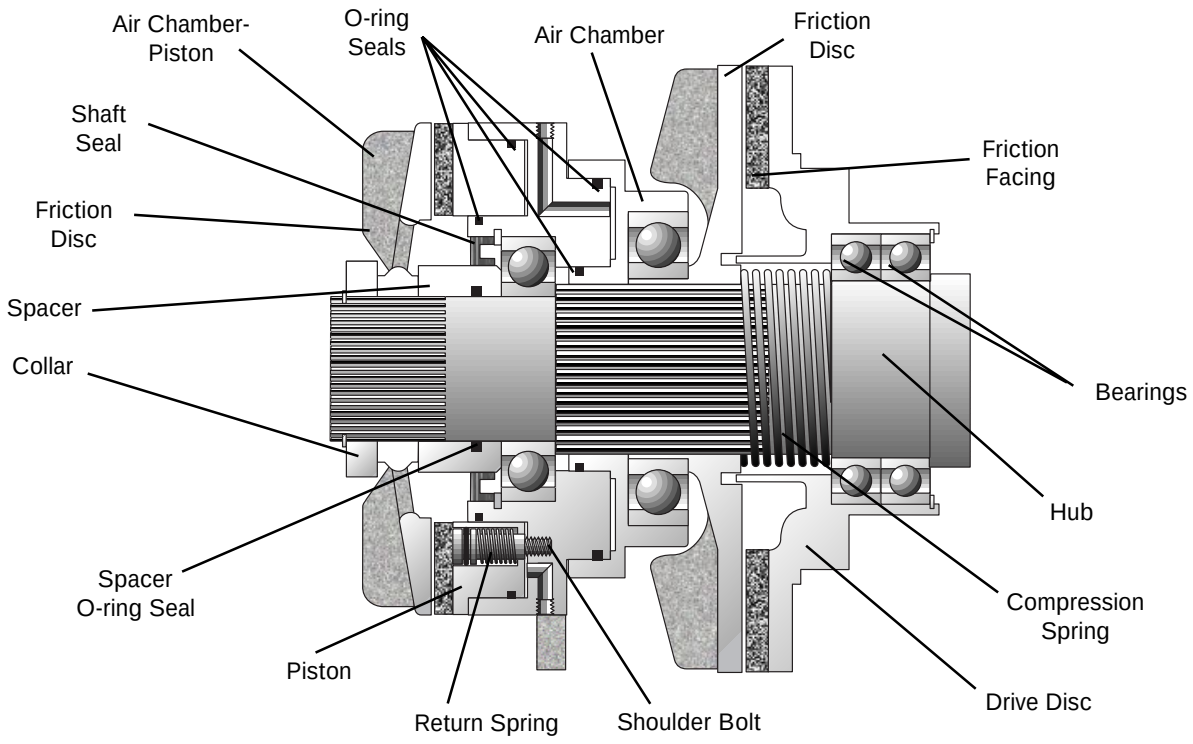

FIGURE 6

PARTS REPLACEMENT

NOTE: The Drive Disc Bearings (Item 15) are not provided with the repair kit and must be ordered separately. Do not remove the Drive Disc Bearings (Item 15) unless you have the replacement bearings. If you are not replacing the Drive Disc Bearings (Item 15), proceed with Step 7.

DISASSEMBLY

WARNING

Special attention should be exercised when working with retaining rings. Always wear safety goggles when working with spring or tension loaded fasteners or devices.

NOTE: The Drive Disc Bearings (Item 15) are not provided with the repair kit and must be ordered separately. Do not remove the Drive Disc Bearings (Item 15) unless you have the replacement bearings. If you are not replacing the Drive Disc Bearings (Item 15), proceed with Step 7.

1. Remove the Retaining Ring (Item 45) (See Figure 7).
2. Loosen the Cap Screw (Item 47, not shown) and Set Screws (Item 48) (See Figure 7).
3. Remove the Hub Collar (Item 46) (See Figure 7).
4. Remove the Friction Disc (Item 44) (See Figure 7).
5. Remove the Spacer (Item 1), Spacer O-ring Seal (Item 25), and Shaft Seal (Item 2) (See Figure 7).
6. Press the Brake Friction Facing (Item 4), Brake Piston (Item 3), Bearing (Item 13), and Air Chamber-Piston (Item 7) off the Hub (Item 43) (See Figure 7).
7. Slide the Air Chamber (Item 8) and Clutch Friction Disc (Item 9) off the Hub (Item 43) (See Figure 7).
8. Remove the Return Spring (Item 11) (See Figure 7).
9. Press the Drive Disc (Item 33) with Bearings off the Hub (Item 43) (See Figure 7).

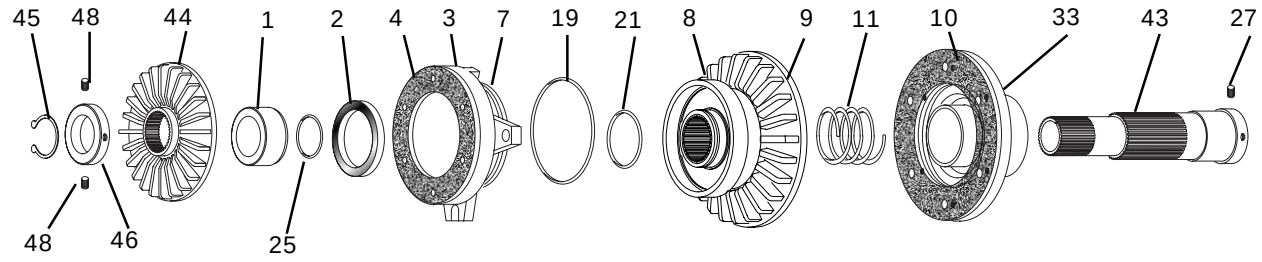

FIGURE 7

BEARING AND FRICTION FACING REPLACEMENT (DRIVE DISC)

WARNING

Special attention should be exercised when working with retaining rings. Always wear safety goggles when working with spring or tension loaded fasteners or devices.

1. Remove the Retaining Ring (Item 41) (See Figure 8).
2. Press the old Bearings (Item 15) out of the Drive Disc (Item 33) (See Figure 8).
3. Clean the bearing bore of the Drive Disc (Item 33) with fresh safety solvent, making sure all old Loctite® residue is removed (See Figure 8).
4. Apply an adequate amount of Loctite® 680 to evenly coat the outer race of the new Bearings (Item 15) (See Figure 8).
5. Carefully align the O.D. of the Bearings (Item 15) with the bore of the Drive Disc (Item 33) and press the new Bearings into place (See Figure 8).
6. Reinstall the Retaining Ring (Item 41) (See Figure 8).

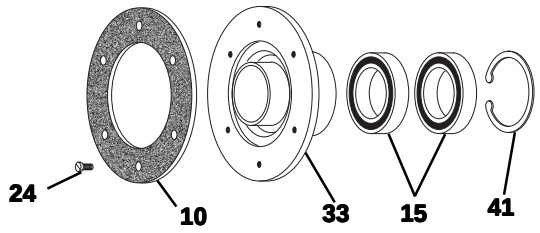

FIGURE 8

7. Remove the old Machine Screws (Item 24) securing the Friction Facing (Item 10) to the Drive Disc (Item 33) (See Figure 8).

   NOTE: The Machine Screws are assembled with an anaerobic locking compound. Inserting a properly fitting screwdriver into the head of the Machine Screw and striking the screwdriver with a hammer will break the crystalline structure of this locking compound and allow removal of the Machine Screws. Never use an impact wrench to remove the Machine Screws.

8. Remove the old Friction Facing (Item 10) (See Figure 8).
9. Install the new Friction Facing (Item 10) and tighten the new Machine Screws (Item 24) to 43 In. Lbs. [4.85 N•m] torque (See Figure 8).

BEARING REPLACEMENT (AIR CHAMBER AND CLUTCH FRICTION DISC)

1. Fully support the Air Chamber (Item 8) and press the Clutch Friction Disc (Item 9) out of the Air Chamber (See Figure 9).

   NOTE: If the Bearing (Item 14) comes out of the Air Chamber (Item 8), use a bearing puller to remove it from the Clutch Friction Disc (Item 9). If the Bearing remains in the clutch Air Chamber, use a die remover to remove it from the Air Chamber.

2. Clean the bearing bore of the Air Chamber (Item 8) with fresh safety solvent, making sure all old Loctite® is removed (See Figure 9).
3. Apply an adequate amount of Loctite® 680 to evenly coat the outer race of the new Bearing (Item 14) (See Figure 9).

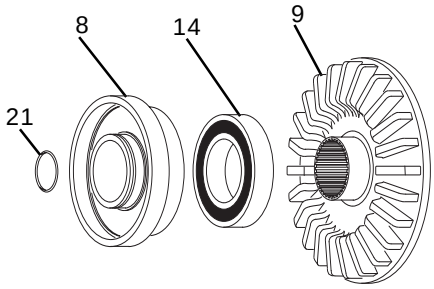

FIGURE 9

4. Carefully align the O.D. of the new Bearing (Item 14) with the bore of the Air Chamber (Item 8) and press the new Bearing into place (See Figure 9).
5. Carefully align the hub of Clutch Friction Disc (Item 9) with the bore of the new Bearing and press the Clutch Friction Disc into the new Bearing and Air Chamber (Item 8) (See Figure 9).

BEARING, FRICTION FACING, AND O-RING REPLACEMENT (AIR CHAMBER-PISTON AND PISTON)

NOTE: The Machine Screws are assembled with an anaerobic locking compound. Inserting a properly fitting screwdriver into the head of the Machine Screw and striking the screwdriver with a hammer will break the crystalline structure of this locking compound and allow removal of the Machine Screws. Never use an impact wrench to remove the Machine Screws.

1. Remove the old Machine Screws (Item 24) and Friction Facing (Item 4) (See Figure 10).
2. Remove the old Shoulder Bolts (Item 5) and Compression Springs (Item 6) (See Figure 10).
3. Separate the Air Chamber-Piston (Item 7) and Piston (Item 3) (See Figure 10).

WARNING

Special attention should be exercised when working with retaining rings. Always wear safety goggles when working with spring or tension loaded fasteners or devices.

4. Remove the Retaining Ring (Item 17) (See Figure 10).
5. Press the old Bearing (Item 13) out of the Air Chamber-Piston (Item 7) (See Figure 10).
6. Clean the bearing bore of the Air Chamber-Piston (Item 7) with fresh safety solvent, making sure all old Loctite® residue is removed (See Figure 10).
7. Apply an adequate amount of Loctite® 680 to evenly coat the outer race of new Bearing (Item 13) (See Figure 10).
8. Carefully align the O.D. of the new Bearing with the bore of the Air Chamber-Piston (Item 7) and press the new Bearing into place (See Figure 10).
9. Reinstall the Retaining Ring (Item 17) (See Figure 10).
10. Remove the old O-ring Seals (Items 18, 19, 20 and 21) from the Air Chamber-Piston (Item 7), Air Chamber (Item 8), and Piston (Item 3) (See Figures 9 and 10).
11. Clean all o-ring grooves and o-ring contact surfaces with fresh safety solvent and lubricate the o-ring grooves and contact surfaces with fresh o-ring lubricant.
12. Lubricate the new O-ring Seals (Items 18, 19, 20, 21, and 22) with fresh o-ring lubricant and install the new O-ring Seals (See Figures 9 and 10).
13. Align the Spring Pin (Item 23) with the hole in the Air Chamber (Item 8) and press the Air Chamber-Piston (Item 7) into the Air Chamber (Item 8) (See Figure 10).
14. Press the Piston (Item 3) into the Air Chamber-Piston (Item 7) (See Figure 10).
15. Apply Loctite® 242 or equivalent to the Shoulder Bolts; then, reinstall the Compression Springs (Item 6), new Shoulder Bolts (Item 5), and new Shoulder Bolt O-rings (Item 22) (See Figure 10).
16. Tighten the new Shoulder Bolts (Item 5) to 5 Ft. Lbs. [6.77 N•m] torque.
17. Install the new Friction Facing (Item 4) and secure it with the new Machine Screws (Item 24).
18. Tighten the new Machine Screws (Item 24) to 43 In. Lbs. [4.85 N•m] torque.
19. Press the new Shaft Seal (Item 2) into the Air Chamber (Item 3) (See Figure 10).

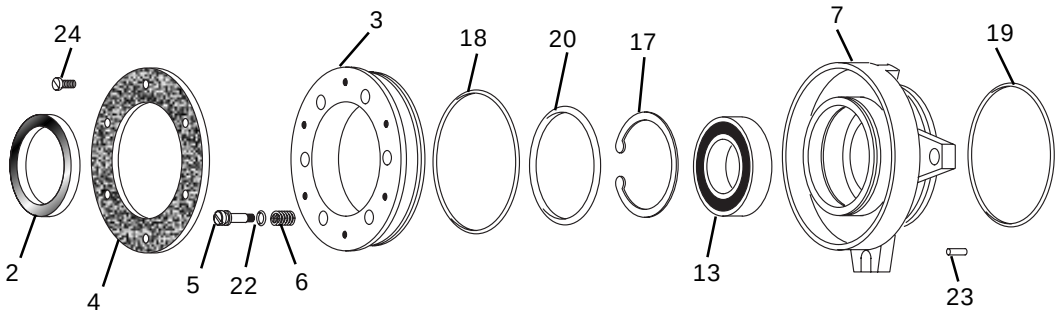

FIGURE 10

CLUTCH-BRAKE REASSEMBLY

1. Supporting the inner bearing races, press the Hub (Item 43) into the Drive Disc (Item 33) and Bearings (Item 15) (See Figure 11).
2. Install the Return Spring (Item 11) (See Figure 11).
3. Supporting the inner bearing race, press the Piston Air-Chamber Assembly (Items 2, 3, 4, 7, 8 and 9) onto the Hub (Item 43) (See Figure 11).
4. Lubricate the new Spacer O-ring Seal (Item 25) with fresh o-ring lubricant and install it into the Spacer (Item 1) (See Figure 11).
5. Press the Spacer (Item 1) into the new Shaft Seal (Item 2) (See Figure 11).
6. Slide the Brake Friction Disc (Item 44) onto the Hub (Item 43) (See Figure 11).
7. Reinstall the Hub Collar (Item 46) (See Figure 11).
8. Reinstall the Retaining Ring (Item 45) (See Figure 11).
9. Tighten the Cap Screw (Item 47) and Set Screws (Item 48) to 25 Ft. Lbs. [33.7 N•m] torque (See Figure 11).

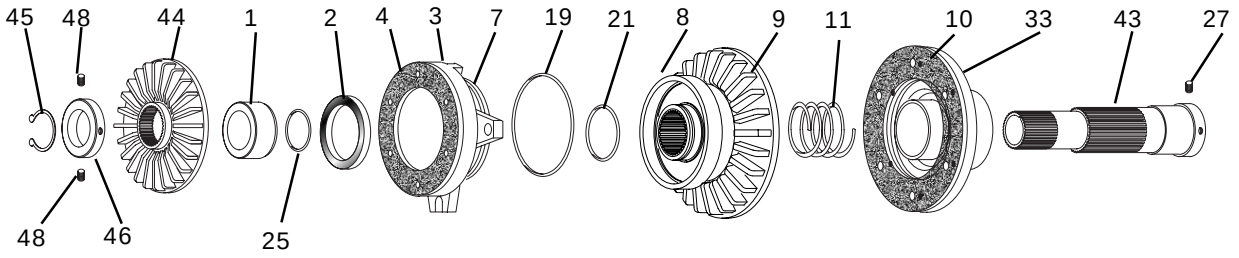

FIGURE 11

REPLACEMENT PARTS

The item or balloon number for all Nexen products is used for part identification on all product parts lists, product price lists, unit assembly drawings, bills of materials, and instruction manuals.

When ordering replacement parts, specify model designation, item number, part description, and quantity. Purchase replacement parts through your local Nexen Distributor.

PARTS LIST

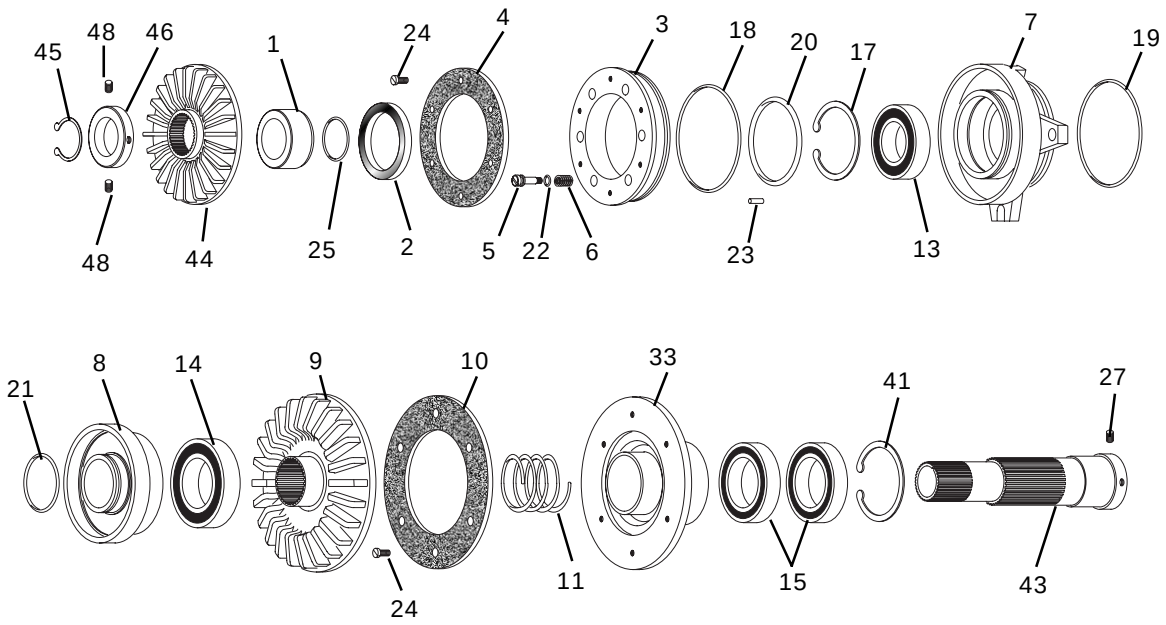

FIGURE 12

ITEM	DESCRIPTION	QTY
1	Spacer	1
2[1]	Shaft Seal	1
3	Piston	1
4[1]	Friction Facing, Brake	1
5[1]	Shoulder Bolt	6
6	Compression Spring	6
7	Air Chamber-Piston	1
8	Air Chamber	1
9	Friction Disc, Clutch	1
10[1]	Friction Facing, Clutch	1
11[1]	Return Spring	1
13[1]	Bearing, Piston	1
14[1]	Bearing, Air Chamber	1
15	Bearing, Drive Disc	2
17	Retaining Ring (Int.)	1
18[1]	O-ring Seal, Piston	1
19[1]	O-ring Seal, Air Chamber-Piston	1

ITEM	DESCRIPTION	QTY
20[1]	O-ring Seal, Air Chamber-Piston	1
21[1]	O-ring Seal, Air Chamber	1
22[1]	O-ring Seal, Shoulder Bolt	6
23	Pin, Spring	1
24[1]	Machine Screw	12
25[1]	Spacer O-ring Seal	1
27	Set Screw	2
30	Key, Hub (Not Shown)	2
32	Air Hose Assembly (Not Shown)	2
33	Drive Disc	1
41	Retaining Ring (Int.)	1
43	Hub	1
44	Friction Disc, Brake	1
45	Retaining Ring (Ext.)	1
46	Hub Collar	1
47	Cap Screw (Not Shown)	1
48	Set Screw	2

[1] Denotes Repair Kit item.
Repair Kit Product No. 848101.

Warranties

Nexen warrants that the Products will be free from any defects in material or workmanship for a period of 12 months from the date of shipment. NEXEN MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, AND ALL IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. This warranty applies only if (a) the Product has been installed, used and maintained in accordance with any applicable Nexen installation or maintenance manual for the Product; (b) the alleged defect is not attributable to normal wear and tear; (c) the Product has not been altered, misused or used for purposes other than those for which it was intended; and (d) Buyer has given written notice of the alleged defect to Nexen, and delivered the allegedly defective Product to Nexen, within one year of the date of shipment.

Exclusive Remedy

The exclusive remedy of the Buyer for any breach of the warranties set out above will be, at the sole discretion of Nexen, a repair or replacement with new, serviceably used or reconditioned Product, or issuance of credit in the amount of the purchase price paid to Nexen by the Buyer for the Products.

Limitation of Nexen's Liability

TO THE EXTENT PERMITTED BY LAW NEXEN SHALL HAVE NO LIABILITY TO BUYER OR ANY OTHER PERSON FOR INCIDENTAL DAMAGES, SPECIAL DAMAGES, CONSEQUENTIAL DAMAGES OR OTHER DAMAGES OF ANY KIND OR NATURE WHATSOEVER, WHETHER ARISING OUT OF BREACH OF WARRANTY OR OTHER BREACH OF CONTRACT, NEGLIGENCE OR OTHER TORT, OR OTHERWISE, EVEN IF NEXEN SHALL HAVE BEEN ADVISED OF THE POSSIBILITY OR LIKELIHOOD OF SUCH POTENTIAL LOSS OR DAMAGE. For all of the purposes hereof, the term "consequential damages" shall include lost profits, penalties, delay images, liquidated damages or other damages and liabilities which Buyer shall be obligated to pay or which Buyer may incur based upon, related to or arising out of its contracts with its customers or other third parties. In no event shall Nexen be liable for any amount of damages in excess of amounts paid by Buyer for Products or services as to which a breach of contract has been determined to exist. The parties expressly agree that the price for the Products and the services was determined in consideration of the limitation on damages set forth herein and such limitation has been specifically bargained for and constitutes an agreed allocation of risk which shall survive the determination of any court of competent jurisdiction that any remedy herein fails of its essential purpose.

Limitation of Damages

In no event shall Nexen be liable for any consequential, indirect, incidental, or special damages of any nature whatsoever, including without limitation, lost profits arising from the sale or use of the Products.

Warranty Claim Procedures

To make a claim under this warranty, the claimant must give written notice of the alleged defect to whom the Product was purchased from and deliver the Product to same within one year of the date on which the alleged defect first became apparent.

nexen

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