

Water Cooled Brakes

Series WCB120 and WCB130

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.

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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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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.

Nexen's double piston design WCB Series brakes provide a wide range of precision torque control in an air actuated, water cooled brake. A special water jacket design with copper alloy disc produces high thermal horsepower.

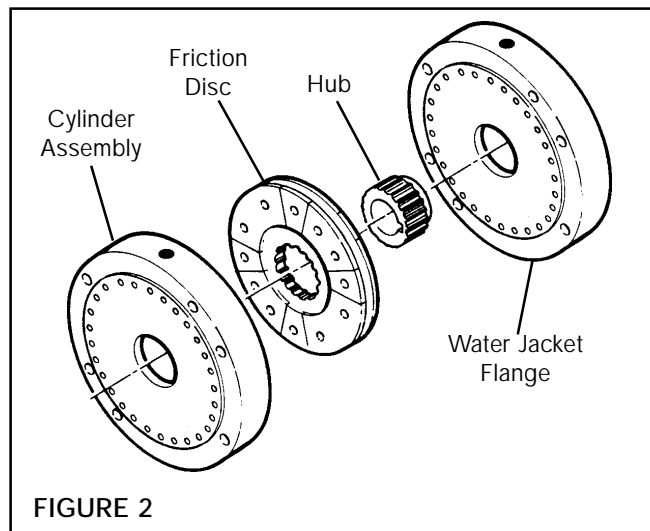
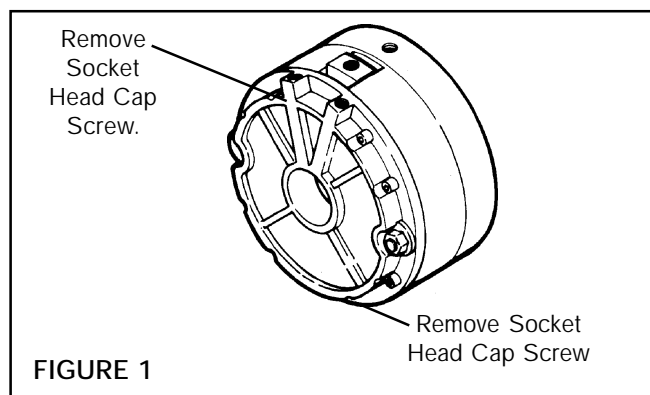
The special copper alloy disc and friction facing are engineered for constant slip applications, thus providing extended life and stable slip torque, while the multiple disc feature allows increased torque capacity in a compact unit.

A copper membrane coats the surface of the water path in the water jacket to prevent rust and extend the life of the brake.

INSTALLATION

WCB PREPARATION

1. Remove two Socket Head Cap Screws from Main Body (See Fig. 1).
2. Disassemble WCB into the following components; Water Jacket Flange, Cylinder Assembly, Hub, and Friction Disc (See Fig. 2).



MACHINE PREPARATION

Drill mounting holes in machine surface (See Figs. 3 & 4 for mounting hole pattern).

CAUTION

Machine shaft must be perpendicular to mounting surface to within 0.002" [0.05mm] and centered within mounting bolt pattern within 0.004" [0.10 mm].

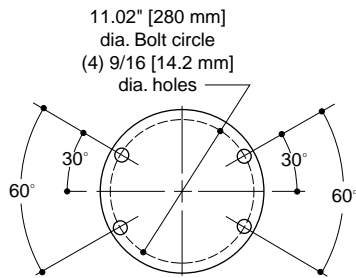


FIGURE 3
WCB120 Mounting Bolt Pattern

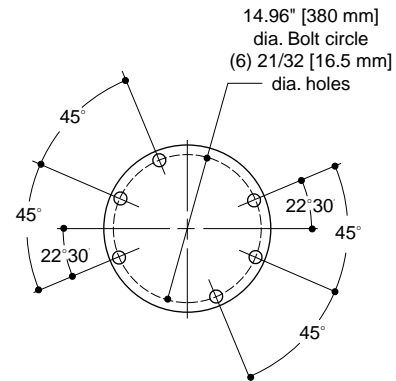


FIGURE 4
WCB130 Mounting Bolt Pattern

MOUNTING WCB120

1. Insert key into machine shaft keyway.
2. Slide Hub onto machine shaft until back of Hub is approximately 1.34" [34 mm] from machine mounting surface (See Fig. 5).
3. Tighten customer supplied set screws securing Hub to machine shaft to torque recommended by set screw vendor.

NOTE: Set screws must be flush with Hub or slightly recessed into Hub to avoid damage to WCB Brake.

4. Apply Never-Seez® or equivalent anti-seize lubricant to Hub.
5. Slide Water Jacket Flange over Hub and machine shaft (See Fig. 5).

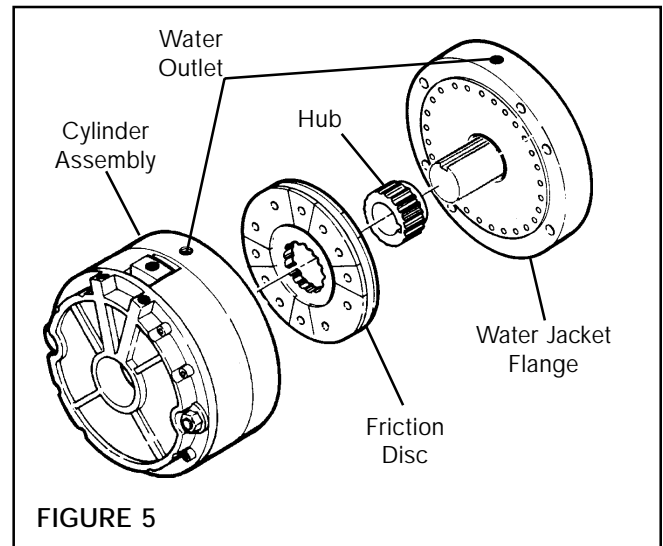


FIGURE 5

6. Position Friction Disc on Hub (See Fig. 5).
7. Slide Cylinder Assembly into position, aligning holes in Cylinder Assembly with holes in Water Jacket and machine mounting surface.(See Fig. 5).
8. Tighten Socket Head Cap Screws securing WCB Brake to mounting surface to 122 ft. lbs.

CAUTION

Water Jacket outlet must be aligned to the twelve o'clock up position and inlet must be aligned to the six o'clock down position. This alignment eliminates air pockets and/or hot spots

MOUNTING WCB130

1. Insert key into machine shaft keyway.
2. Slide Hub onto machine shaft until back of Hub is approximately 1.38" [36 mm] from machine mounting surface. (See Fig. 6).
3. Tighten customer supplied set screws securing Hub to machine shaft to torque recommended by set screw vendor.

NOTE: Set Screws must be flush with Hub or slightly recessed into Hub to avoid damage to WCB Brake.

4. Apply Never-Seez® or equivalent lubricant to Hub.
5. Slide Water Jacket Flange over Hub and machine shaft (See Fig. 6).

CAUTION

Water Jacket outlet must be aligned to the twelve o'clock up position and the inlet must be aligned to the six o'clock down position.

6. Insert Cap Screws (Item 25) into counter sunk holes in Water Jacket Flange, and secure Water Jacket Flange to machine mounting surface.

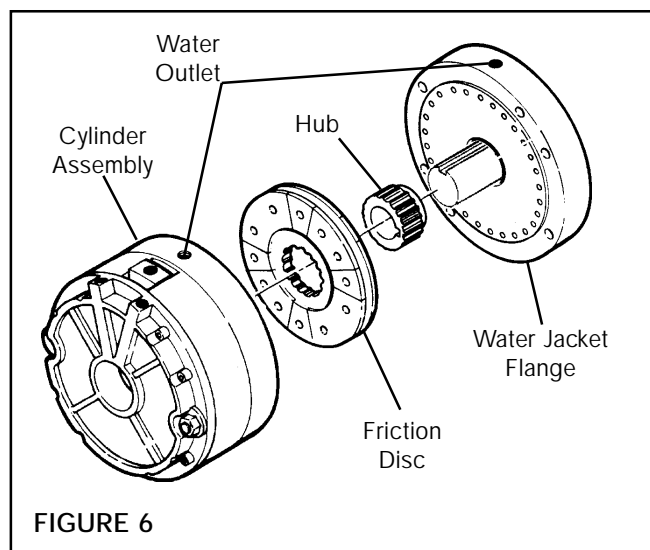


FIGURE 6

7. Tighten two Cap Screws to 184 ft. lbs. torque.
8. Position Friction Disc on Hub (See Fig. 6).
9. Slide Cylinder Assembly into position, aligning holes in Cylinder Assembly with holes in Water Jacket Assembly and machine mounting surface (See Fig. 6).
10. Tighten four remaining Socket Head Cap Screws securing Cylinder Assembly to Water Jacket Assembly and machine to 184 ft. lbs. torque.

AIR CONNECTIONS

All Nexen pneumatically actuated devices require clean lubricated air for maximum performance and long life. Your local Horton distributor carries filters, regulators, and lubricators specifically designed to operate with Nexen products.

For quick response, short air lines between the control valve and the WCB Brake are recommended.

NOTE: Do not use rigid pipe or tubing when making air connections to the WCB Brake.

Air inlets for the WCB Brake's "S" Piston and "L" Piston are located in the Air Chamber and are tapped 1/4 NPT (See Fig. 7).

The Dual Piston design of the WCB Brake allows multiple torque ranges (See Table 1).

TABLE 1

| WCB120 | WCB130 | Use Piston |
|--------------|---------------|------------|
| 350 ft. lbs. | 1042 ft. lbs. | "L" + "S" |
| 233 ft. lbs. | 692 ft. lbs. | "L" |
| 117 ft. lbs. | 350ft. lbs. | "S" |

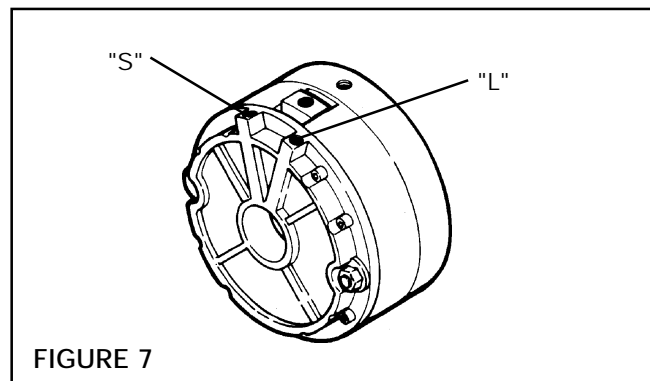


FIGURE 7

LUBRICATION

The most effective and economical way to lubricate the WCB Brake's air chamber is with an air line lubricator. Available from Nexen, the lubricator injects oil into the pressurized air, forcing a constant oil mist into the air chamber.

Lubricator drip rate is properly set when an oil drop starts to form in the sight gage every time the WCB Brake is cycled or one full drop every twenty cycles.

Locate lubricator above and within ten feet of the WCB Brake.

For WCB Brakes that are cycled infrequently, apply two or three drops of oil into the air inlet ports every two weeks.



WARNING

Synthetic lubricants are not recommended, use a low viscosity petroleum base oil such as SAE-10.

COOLING WATER CONNECTIONS

Water inlet and outlet ports for the WCB Brake are located in the Pressure Water Jacket and Flange Water Jacket. To assure that the WCB Brake is filled with water at all times the water must enter at the bottom and discharge at the top (See Fig. 8).

NOTE: Use flexible hose for water lines and route water lines to insure equal flow to inlet and outlet ports. The use of rigid pipe or tubing will prevent proper WCB Brake actuation.



WARNING

Headers installed in the inlet and outlet ports must be of a type that provide equal flow at ports.

Water inlet temperature should be approximately 68° F. [20° C.] or lower and controlled so that the outlet temperature does not exceed 120° F. [50° C.] (148° F. [65° C.] Maximum).

Use clean water free from rust, dust, or other corrosive material.

To determine the proper flow of cooling water, use the following formula:

$$\text{GPM min} = \frac{6.8 (\text{HP})}{T_o - T_i}$$

Where: **GPM min** = Minimum gallons per min required
HP = Thermal horsepower requirement
 T_o = Outlet water temperature
 T_i = Inlet water temperature



WARNING

Insufficient water flow will cause the WCB Brake to overheat, resulting in excessive friction facing wear, loss of torque, excessive friction surface wear and O-ring damage. Refer to Table 2 for recommended cooling water flow.

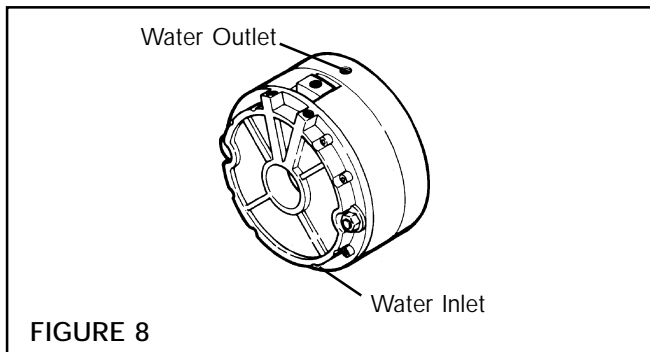
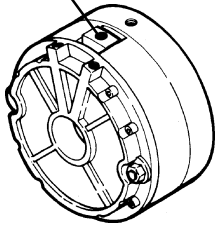


TABLE 2

| MAX. RECOMMENDED COOLING WATER FLOW | | |
|-------------------------------------|------------------|-----------------|
| WCB BRAKE | GALLONS PER MIN. | LITERS PER MIN. |
| WCB120 | 2.6 G.P.M. | 10 L.P.M. |
| WCB130 | 5.3 G.P.M. | 20 L.P.M. |

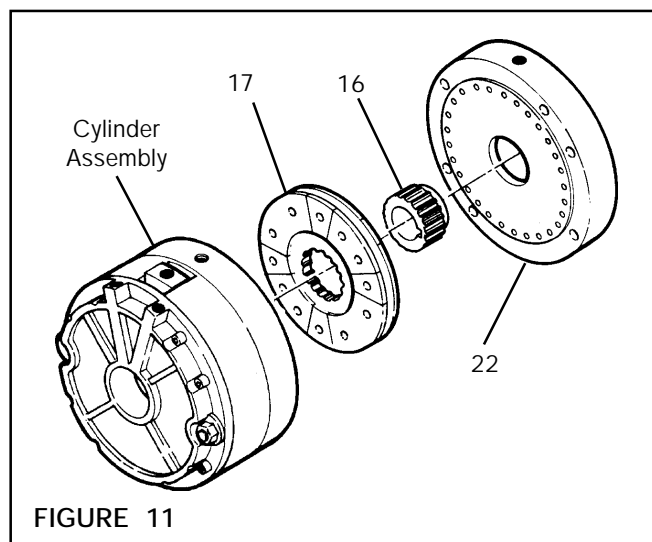
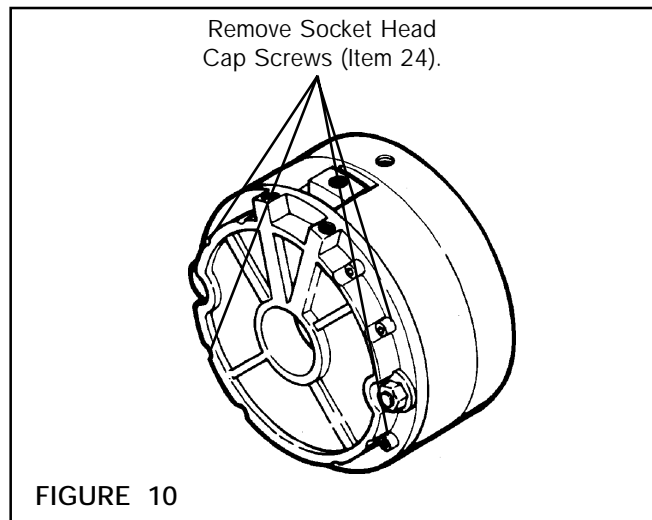
TROUBLESHOOTING

| SYMPTOM | PROBABLE CAUSE | REMEDY |
|----------------------|---|--|
| Failure to Engage | Air not getting to WCB | Air pressure too low- Check for control valve malfunction. |
| | Air leak in WCB | Defective or broken O-rings- Replace O-ring seals. |
| | Friction Disc binding on Hub | Lack of lubrication on Hub- Hub must be lubricated. |
| | Rigid pipe or tubing used for air lines | Flexible tubing must be used for air lines. |
| Failure to Disengage | Unexhausted air due to faulty control or restricted air line | Check controls and air lines for restrictions. |
| | Friction Disc binding on Hub | Lack of lubrication on Hub- Hub must be lubricated. |
| | Broken or weak Return Springs | Replace Return Springs. |
| Overheating | Shortage of cooling water | Inspect water lines. Replace if defective. Inspect water flow controls. Replace if defective. |
| | Water Jacket restricted by scale or rust | Flush Water Jacket with automo- tive radiator cleaner. |
| Loss of torque | Worn Friction Facing | <p>Inspect Friction Facing and replace when space between Cylinder and Water Jacket Pressure Assembly is less than 0.55" [14 mm] for WCB120 and 0.63" [16 mm] for WCB130 (See Fig. 9).</p> <p>Measure Gap between Cylinder and Water Jacket Pressure Assembly</p>  <p>FIGURE 9</p> |

PARTS REPLACEMENT

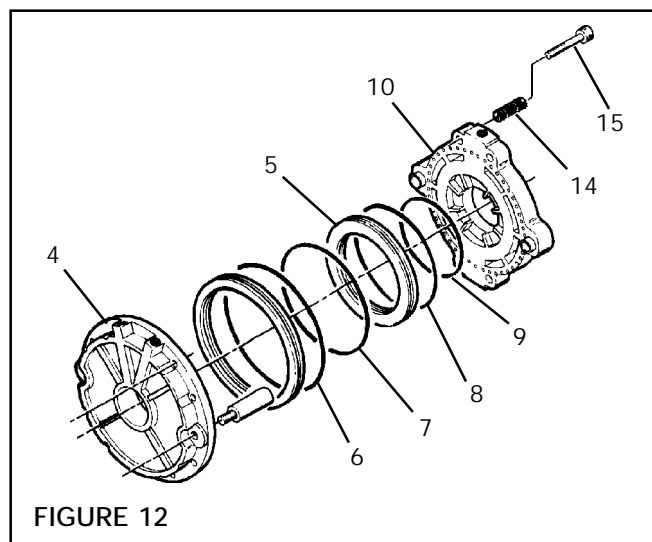
FRICTION DISC

1. Remove four Socket Head Cap Screws (Item 24) (See Fig. 10)
2. Separate Cylinder Assembly from Water Jacket Flange (Item 22) (See Fig. 11).
3. Slide Friction Disc (Item 17) off Hub (Item 16) (See Fig. 11).
4. Clean and lubricate Hub (Item 16) spline with Never-Seez® or equivalent (See Fig. 11).
5. Install new Friction Disc.
6. Reverse above procedure to reassemble WCB120.
7. Tighten four Socket Head Cap Screws (Item 24) removed in Step 1 to 122 ft. lbs. torque on WCB120 and 184 ft. lbs. torque on WCB130.



O-RING SEAL REPLACEMENT

1. Remove two Shoulder Screws (Item 15) and Springs (Item 14) securing Pressure Water Jacket (Item 10) to Cylinder assembly (See Fig. 12).
2. Remove Pressure Water Jacket Assembly (Item 10) from Cylinder assembly (See Fig. 12).
3. Separate Large and Small Pistons (Items 4 & 5) from Cylinder Assembly (See Fig. 12).
4. Remove O-rings (Items 6 & 7) from Large Piston (Item 4) and O-rings (Items 8 & 9) from Small Piston (Item 5) (See Fig. 12).
5. Lubricate O-ring grooves of both Pistons and new O-rings with O-ring lubricant and install new O-rings into respective grooves of both Pistons (See Fig. 12).



6. Install Large and Small Pistons (Items 4 & 5) back into Cylinder Assembly.
7. Secure Pressure Water Jacket (Item 10) to Cylinder Assembly.

NOTE: Inspect Springs (Item 14) for signs of fatigue and replace Springs if required.

8. Tighten Shoulder Screws (Item 15) to 9 ft. lbs. torque.

WATER JACKET (Pressure) O-RING REPLACEMENT

1. Disassemble WCB Brake and remove Water Jacket (Pressure) (Item 10) from machine.
2. Remove Button Head Cap Screws (Item 26) and Hex. Nuts (Item 27) securing Copper Plate (Item 13) to Water Jacket (Item 10) (See Fig. (13)).
3. Remove O-rings (Items 11 & 12).
4. Clean surface of Water Jacket (Item 10).

NOTE: Water Jacket coolant path is coated with a special waterproof paint, if paint is damaged, repaint coolant path with fresh waterproof paint.

5. Coat new O-rings with gasket sealant and install new O-rings.
6. Replace Copper Plate (Item 13) and secure with Button Head Cap Screws (Item 26) and Nuts (Item 27).

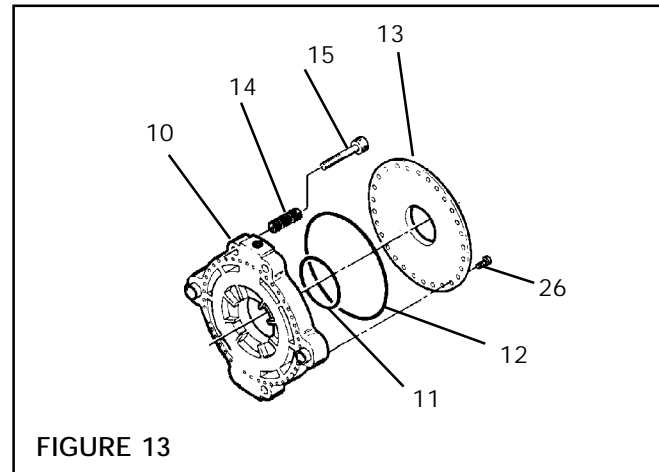


FIGURE 13

7. Tighten Button Head Cap Screws to 2 ft. lbs. torque.
8. Pressure test Water Jacket for leaks.
9. Reassemble WCB Brake.

WATER JACKET (Flange) O-RING REPLACEMENT

1. Disassemble WCB Brake and remove Water Jacket (Flange) (Item 22) from machine.
2. Remove Button Head Cap Screws (Item 26) and Hex. Nuts (Item 27) securing Copper Plate (Item 19) to Water Jacket (Item 22) (See Fig. (14)).
3. Remove O-rings (Items 19 & 20).
4. Clean surface of Water Jacket (Item 22).

NOTE: Water Jacket coolant path is coated with a special waterproof paint, if paint is damaged, repaint coolant path with fresh waterproof paint.

5. Coat new O-rings gasket sealant and install new O-rings.
6. Replace Copper Plate (Item 21) and secure with Button Head Cap Screws (Item 26) and Nuts (Item 27).

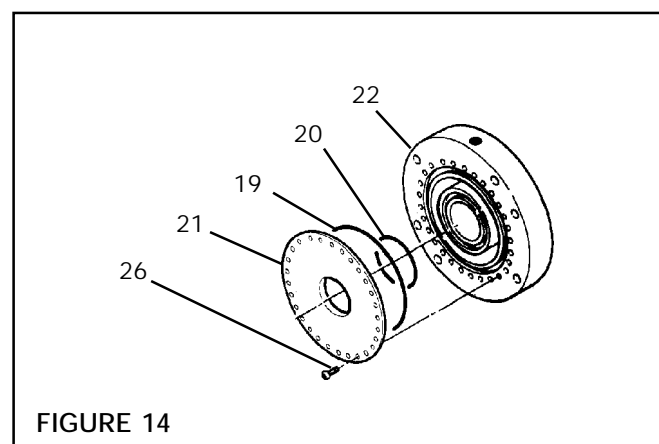


FIGURE 14

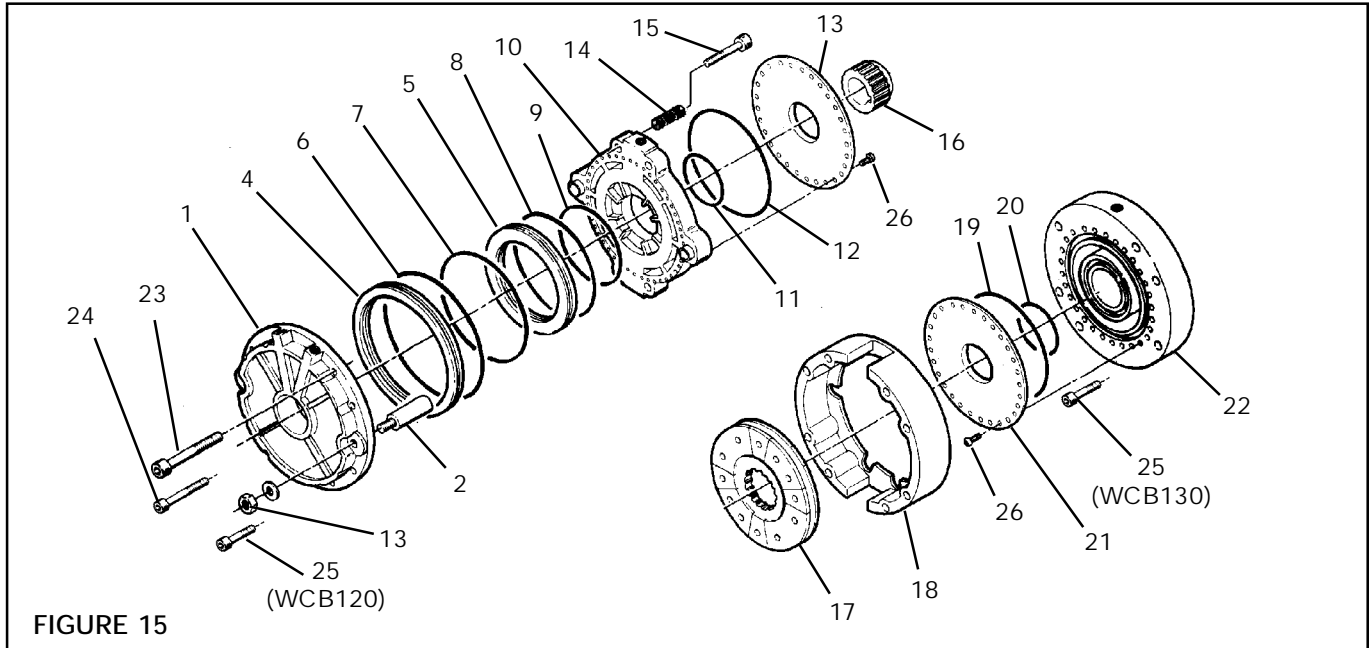
7. Tighten Button Head Cap Screws to 2 ft. lbs. torque.
8. Pressure test Water Jacket for leaks.
9. Reassemble WCB Brake.

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



| ITEM | DESCRIPTION | QUANTITY | |
|------|-------------------------|----------|--------|
| | | WCB120 | WCB130 |
| 1 | Cylinder | 1 | 1 |
| 2 | Torque Pin | 2 | 2 |
| 3 | Lock Nut | 2 | 2 |
| 4 | Piston (Large) | 1 | 1 |
| 5 | Piston (Small) | 1 | 1 |
| 6 | O-ring | 1 | 1 |
| 7 | O-ring | 1 | 1 |
| 8 | O-ring | 1 | 1 |
| 9 | O-ring | 1 | 1 |
| 10 | Water Jacket (Pressure) | 1 | 1 |
| 11 | O-ring | 1 | 1 |
| 12 | O-ring | 1 | 1 |
| 13 | Copper Plate | 1 | 1 |
| 14 | Spring | 2 | 2 |
| 15 | Shoulder Screw | 2 | 2 |
| 16 | Hub (Splined) | 1 | 1 |
| 17 | Friction Disc | 1 | 1 |
| 18 | Housing | 1 | 1 |
| 19 | O-ring | 1 | 1 |
| 20 | O-ring | 1 | 1 |
| 21 | Copper Plate | 1 | 1 |
| 22 | Water Jacket (Flange) | 1 | 1 |
| 23 | Cap Screw | 2 | 2 |
| 24 | Cap Screw | 4 | 4 |
| 25 | Cap Screw | 2 | 2 |
| 26 | Button Head Cap Screw | 80 | 116 |
| 27 | Hex. Nut (Not Shown) | 80 | 116 |

WARRANTIES

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 damages, 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.

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