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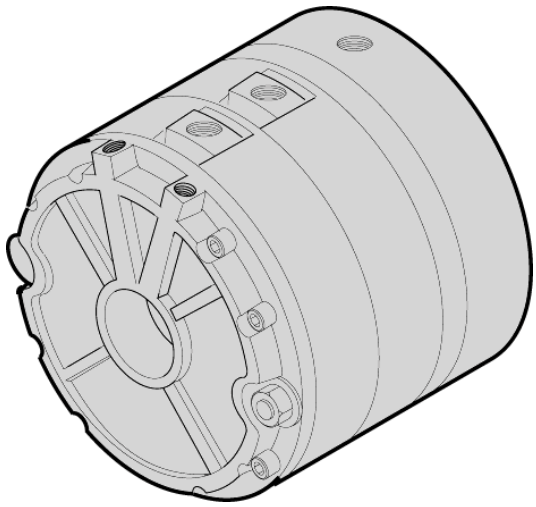
AIR CHAMP® PRODUCTS

User Manual



Water Cooled Brake

Series WCB230

FORM NO. L-20163-B-0601

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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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.

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, Intermediate Water Jacket Assembly, and two Friction Disc.

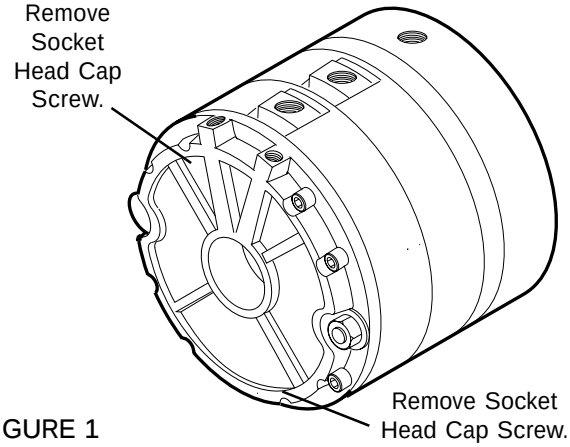

FIGURE 1

MACHINE PREPARATION

Drill mounting holes in machine surface (See Fig, 2 for mounting hole pattern).

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

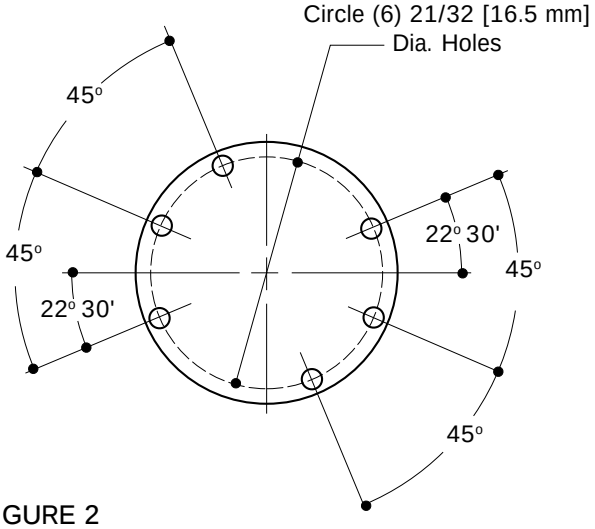

FIGURE 2

MOUNTING CB230

1. Insert key into machine shaft keyway.

2. Slide Hub onto machine shaft until back of Hub is approximately 1.38" [35 mm] from machine mounting surface.

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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, Intermediate Spacer Ring, and Intermediate Housing over Hub and machine shaft (See Fig. 3).

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.

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

7. Tighten two Cap Screws to 184 ft. lbs. torque.

8. Position first Friction Disc on Hub.

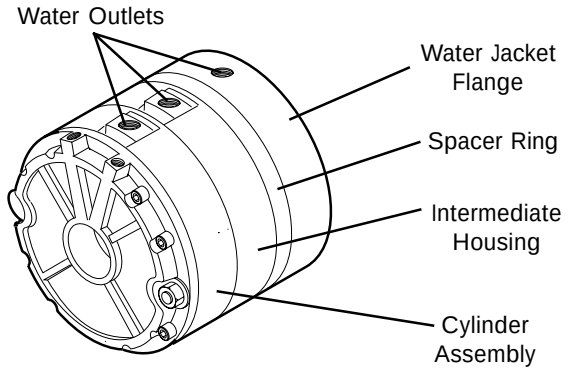


FIGURE 3

9. Position first Pressure Water Jacket in place on Torque Pins.

10. Position second Friction Disc on Hub.

11. Slide Cylinder Assembly into position, aligning holes in Cylinder Assembly with holes in Water Jacket Assembly and machine mounting surface.

12. 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 Nexen 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. Where long air lines are required, a Quick Exhaust Valve (Nexen Product No. 945100) is recommended to ensure rapid disengagement.

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. 4).

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

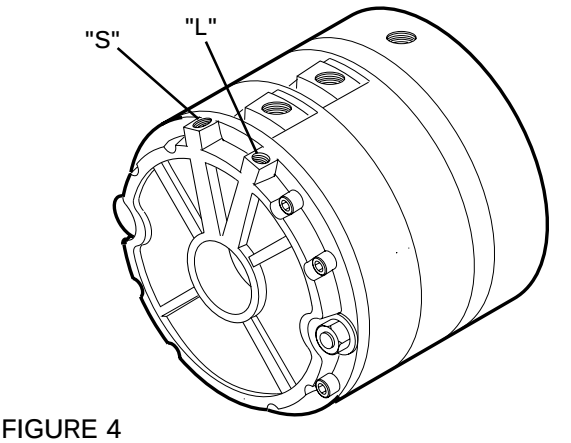


FIGURE 4

TABLE 1

WCB230	Use Piston
2084 ft. lbs.	"L" + "S"
1393 ft. lbs.	"L"
725 ft. lbs.	"S"

Note: Torque Ratings Based on 80 P.S.I.

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 oil drops 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. 5).

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 54° F. [20° C.] or lower and controlled so that the outlet temperature does not exceed 108° F. [50° C.] (135° 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:

$$\text{GPM min} = \frac{6.8\ (\text{HP})}{T_o - T_1}$$

Where: GPM min = Minimum gallons per min required
HP = Thermal horsepower requirement.
T_o = Outlet water temperature
T_1 = 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.
WCB230	10.4 G.P.M.	40 L.P.M.

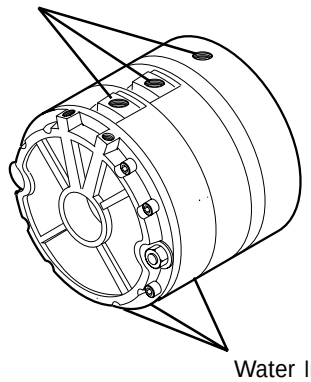
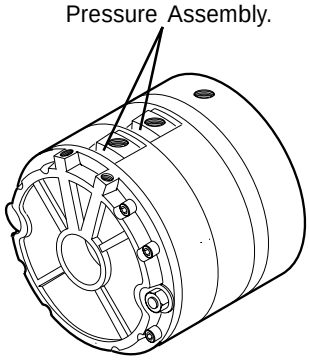


FIGURE 5

TROUBLESHOOTING

Symptom	Probable Cause	Remedy
Failure to Engage	Air not getting to WCB	Air pressure too low- Check for controlvalve 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	Check controls and air lines for restrictions
	Friction Disc binding on Hub	Lack of lubrication on Hub- The Hub musbe lubricated.
	Broken or weak Return Springs	Replace Return Springs.
Overheating	Shortage of cooling water	Inspect water lines. Replace if defec tive. Inspect water flow controls. Replace if defective.
	Water Jacket restricted by scale	Flush Water Jacket with automotive radiator cleaner.
Loss of torque	Worn Friction Facing	Inspect Friction Facing and replace when space between Cylinder and Water Jacket Pressure Assembly is less than 0.70 [18 mm] (See Fig. 6). Measure Gap between Cylinder and Water Jacket Pressure Assembly.  FIGURE 6

FRICTION DISC

1. Remove four Socket Head Cap Screws (Item 25) and two Socket Head Cap Screws (Item 24) (See Fig. 7)
2. Separate all WCB components from Water Jacket Flange (Item 23).
3. Slide First Friction disc closest to Water Jacket Flange off Hub.
4. Lubricate Hub (Item 16) spline with Never-Seez or equivalent.
5. Install first Friction Disc (Item 17) closest to Hub.
6. Starting at the Water Jacket Flange end of WCB, replace all components up to and including the Intermediate Housing (Item 19).
7. Install Second Friction Disc (Item 17).
8. Replace remaining WCB components.

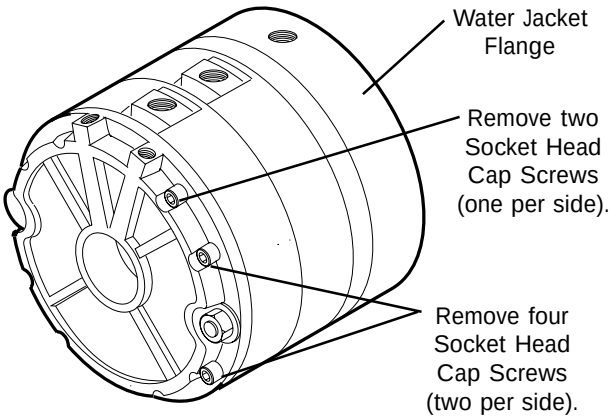


FIGURE 7

9. Tighten Socket Head Cap Screws (Items 24 & 25) to 184 ft. lbs. torque.

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. 8).
2. Remove Pressure Water Jacket Assembly (Item 10) from Cylinder assembly (See Fig. 8).
3. Separate Large and Small Pistons (Items 4 & 5) from Cylinder Assembly (See Fig. 8).
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. 8).
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. 8).
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.

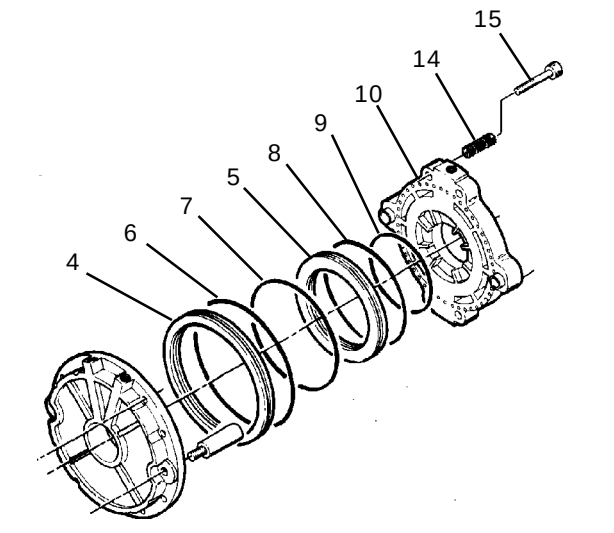


FIGURE 8

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

PRESSURE WATER JACKET (Item 10) & INTERMEDIATE WATER JACKET (Item 22) O-RING REPLACEMENT

1. Disassemble WCB Brake and remove Water Jacket (Pressure) (Item 10) and Water Jacket (Intermediate) (Item 21) from machine.
2. Remove Button Head Cap Screws (Item 27) and Hex. Nuts (Item 28) securing Copper Plate (Item 13) to Water Jacket (Item 10 & 21) and Copper Plates (Item13 & 20) to Water Jacket (Item 10 & 21) (See Fig. (9).
3. Remove O-rings (Items 11 & 12).
4. Clean surface of Water Jacket (Item (10 & 21).

   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 & 20) and secure with Button Head Cap Screws (Item 27) and Nuts (Item 28).

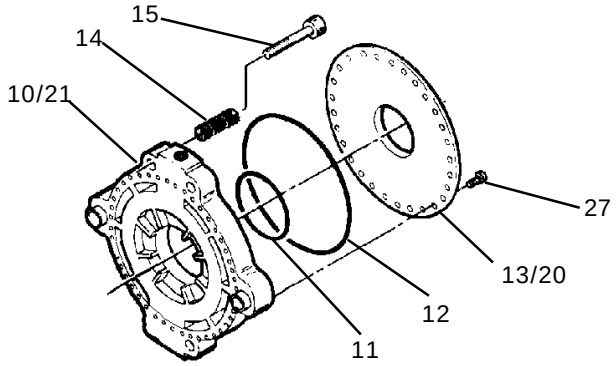


FIGURE 9

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 23) from machine.
2. Remove Button Head Cap Screws (Item 27) and Hex. Nuts (Item 29) securing Copper Plate (Item 13) to Water Jacket (Item 23) (See Fig. (10).
3. Remove O-rings (Items 11 & 12).
4. Clean surface of Water Jacket (Item (23).

   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 27) and Nuts (Item 28).

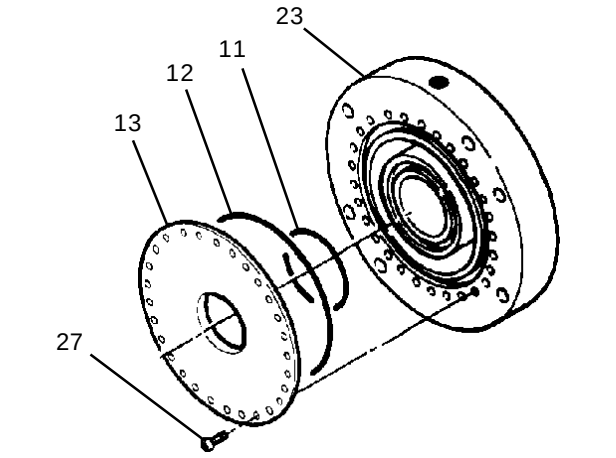


FIGURE 10

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

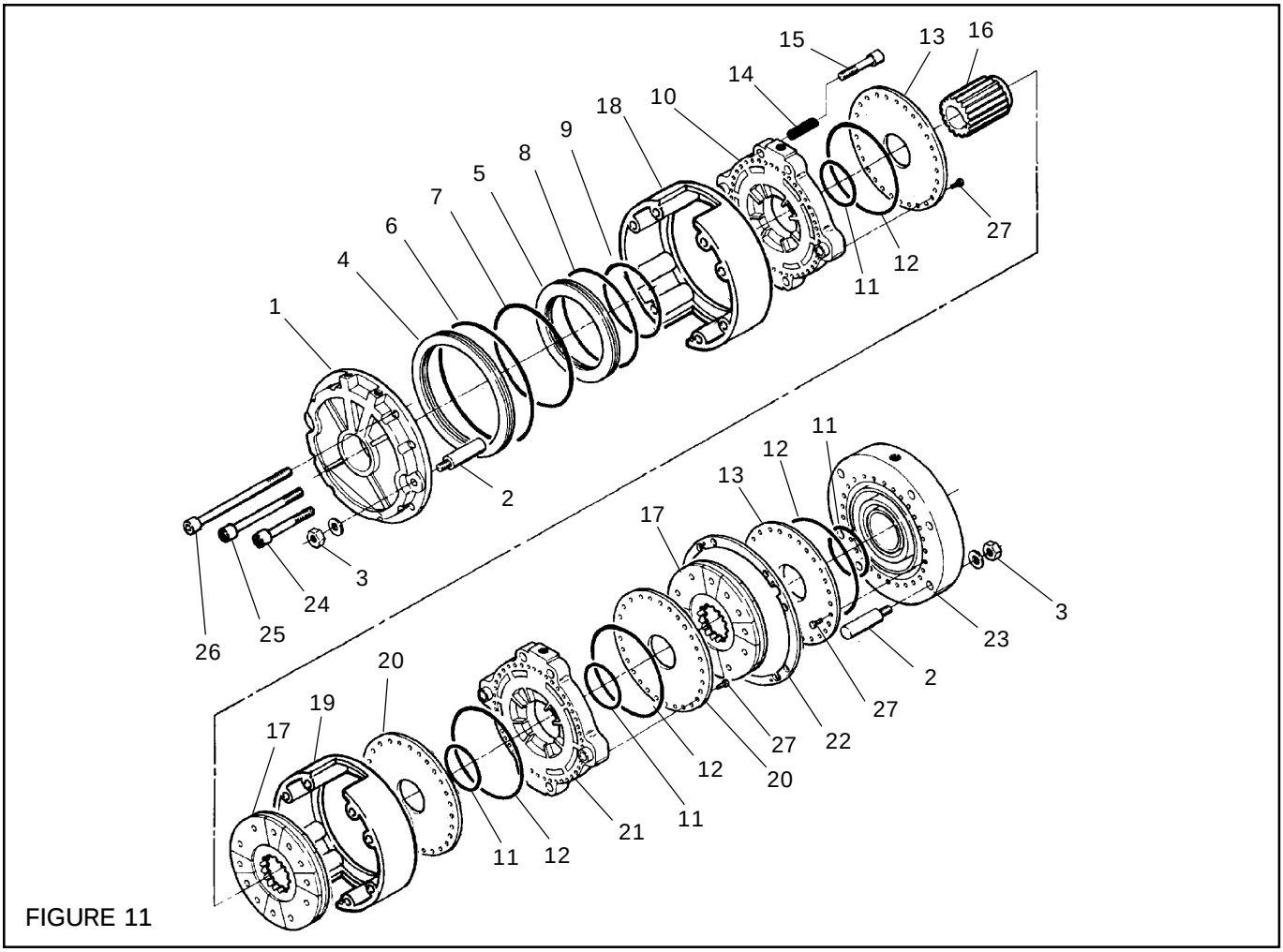


FIGURE 11

ITEM	DESCRIPTION	QTY.
1	Cylinder	1
2	Torque Pin	4
3	Lock Nut	4
4	Piston (Large)	1
5	Piston (Small)	1
6	O-Ring	1
7	O-Ring	1
8	O-Ring	1
9	O-Ring	1
10	Water Jacket (Pressure)	1
11	O-Ring	4
12	O-Ring	4
13	Copper Plate	2
14	Spring	2

ITEM	DESCRIPTION	QTY.
15	Shoulder Screw	2
16	Hub	1
17	Friction Disc	2
18	Housing	1
19	Housing (Intermediate)	1
20	Copper Plate	2
21	Water Jacket (Intermediate)	1
22	Spacer Ring	1
23	Water Jacket (Flange)	1
24	Cap Screw	2
25	Cap Screw	4
26	Cap Screw	2
27	Button Head Cap Screw	244
28	Hex. Nut (Not Shown)	244

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.

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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.

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