nexen®

AIR CHAMP® PRODUCTS

User Manual

Water Cooled Brake

Model W-1000

FORM NO. L-20074-E-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.

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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

TABLE OF CONTENTS

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.

CAUTION

This unit has rotating parts. Nexen recommends using a guard that will not restrict the flow of cooling air around the unit if the unit is installed where injury to an operator could occur. Contact your local Nexen Distributor for information about guards designed for ''Air Champ'' brakes.

INSTALLATION

1. Place the Key (Item 5) in the shaft keyway and slide the brake onto the shaft over the key.

   NOTE: Position the brake so the port marked WATER INLET is located at the bottom. Water must enter at the bottom to make sure the brake will be full of water at all times.

2. Secure the brake to a solid support using the four 17/32" [1.3 cm] diameter mounting holes provided in the Air Chamber (Item 3) flange.

   NOTE: If the brake is not flange mounted, use a 7/8" [2.2 cm] diameter torque pin in the slot provided in the Air Chamber flange to absorb the braking torque. Torque pin bracket assemblies (product no. 825500) are available from Nexen or your local Nexen distributor.

3. Tighten the three Set Screws (Items 15 and 20) located in the Friction Disc Hub to secure the brake to the shaft.

AIR AND WATER CONNECTION

The brake's air inlet is located in the Air Chamber (Item 3) and is tapped 1/4 NPT. For quick response, connect a short air line between the brake and the air controls. Air controls that have at least 1/8" [0.3 cm] ports are recommended and a quick exhaust valve should be used where long air lines are required. Pneumatically actuated devices require clean, pressure regulated air for maximum performance and long life. It is recommended a filter, regulator, and lubricator be used on the air line ahead of the air controls.

The brake's water inlet and outlet ports are located in the Water Jacket Assembly (Item 2) and are tapped 1/8 NPT. To ensure the brake will be full of water at all times, the water should enter the brake at the bottom and discharge at the top. Water entering the brake should be free of contaminants. Use the two Hose Assemblies (Item 6) supplied with the brake to connect the water lines and controls to the inlet and outlet ports. The use of rigid pipe or tubing will prevent proper actuation of the brake.

OPERATION

In constant slip of drag applications, the W-1000 Brake is capable of dissipating a maximum of 8 thermal horsepower or 264,000 Ft. Lbs. [357,936.5 N•m] of energy per minute. In cyclic applications, the energy input increases by the cycle rate. Damage to the brake will result if the amount of energy input times the number of engagements per minute exceeds the brake's thermal rating. Insufficient water flow will cause the brake to overheat and result in high friction facing wear, torque loss, and damage to the friction surface of the Water Jacket Assembly (Item 2). The correct water flow can be determined using the formula:

$$GPM_{min} = \frac{5.1\ (HP)}{T_0 - T_1}$$

where: GPM_{min} = Minimum gallons per minute required
HP = Thermal Horsepower requirement
T_0 = Outlet water temperature
T_1 = Inlet water temperature

Water inlet temperature should be approximately 70^0 F [21° C] and the water outlet temperature should not exceed 150^0 F [66° C]. Water flow can be automatically controlled using a system with a water tempering valve (See Figure 1). If a manual control is desired, use a ON/OFF valve and flow meter on the water inlet to maintain a proper flow of cooling water.

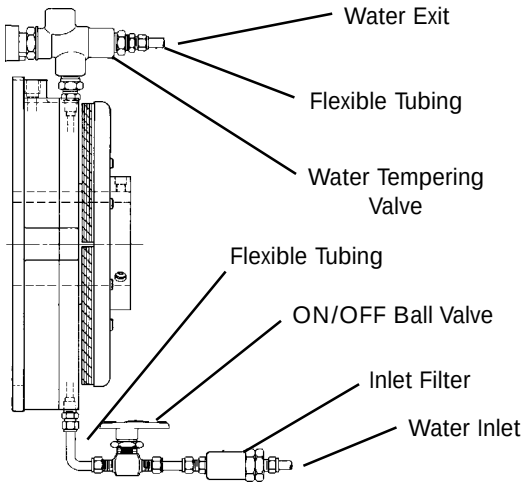

FIGURE 1

LUBRICATION

The Ball Bearing (Item 8) in the W-1000 Brake is prelubricated, sealed, and does not require lubrication.

MAINTENANCE

Water flow through the brake's water jacket could become restricted by scale and rust. If there is a noticeable restriction, flush the water jacket with and automotive radiator cleaner.

Periodically inspect all mounting bolts, air line fittings, and water line connections to make sure they are tightened securely. Inspect the Friction Facing (Item 4) and replace it if it is worn to the metal backing plates.

PARTS REPLACEMENT

FRICTION FACINGS

1. Remove the six Socket Head Cap Screws (Item 14) and Lock Washers (Item 18) (See Figure 2).

2. Remove the old split Friction Facing (Item 4) (See Figure 2).

3. Install the new split Friction Facing (Item 4) and secure it with six new Socket Head Cap Screws (Item 14) and Lock Washers (Item 18).

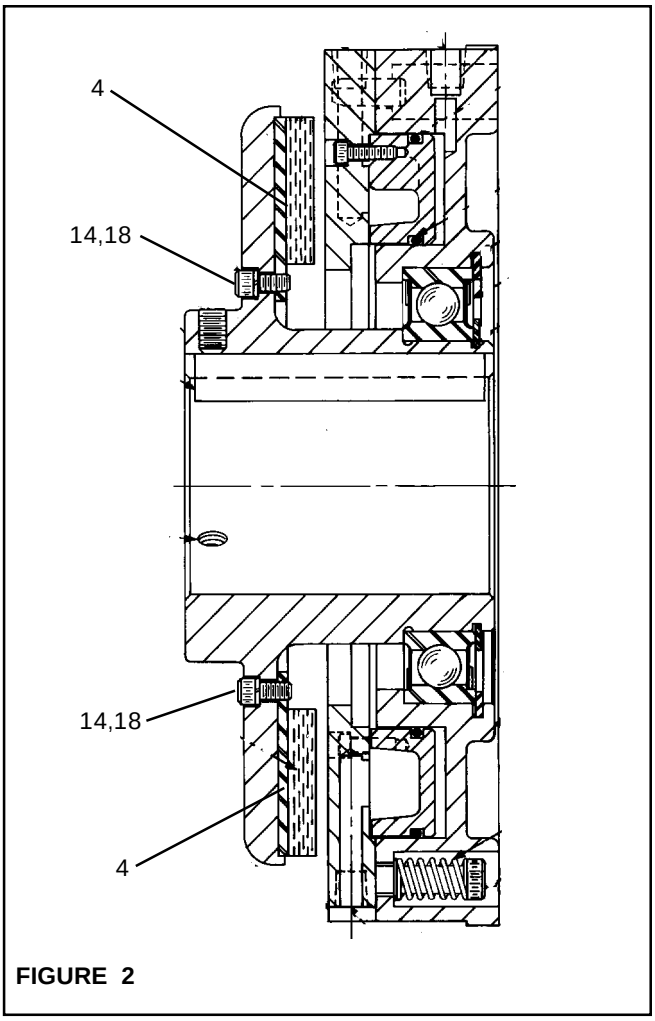

FIGURE 2

BALL BEARING, O-RING SEAL, AND RETURN SPRINGS

1. Remove the Retaining Ring (Item 10) (See Figure 3).

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.

2. Press the Friction Disc Hub (Item 1) out of the Ball Bearing (Item 8) (See Figure 3).

3. Alternately and evenly remove the three old Shoulder Screws (Item 16) and old Return Springs (Item 17) (See Figure 3).

4. Separate the Air Chamber (Item 3) from the Water Jacket Assembly (Item 2) (See Figure 3).

5. Remove the old O-ring Seals (Items 12 and 13) and clean the o-ring seal contact surfaces of the Air Chamber (Item 3) and the Water Jacket Assembly (Item 2) with fresh solvent (See Figure 3).

6. Coat the new O-ring Seals (Item 12 and 13) with a thin film of o-ring lubricant; then, install the new O-ring Seals on the Water Jacket Assembly.

7. Remove the Retaining Ring (Item 11) and press the old Ball Bearing (Item 8) out of the Air Chamber (Item 3) (See Figure 3).

8. Clean the bearing bore of the Air Chamber with solvent, removing all traces of old Loctite® residue.

9. Apply an adequate amount of Loctite® 680 to evenly coat the outer race of the new Ball Bearing (Item 8) and press the new Ball Bearing into the Air Chamber (Item 3) (See Figure 3).

10. Install the Retaining Ring (Item 11) (See Figure 3).

11. Slide the Air Chamber (Item 3) and Ball Bearing (Item 8) onto the Water Jacket Assembly (Item 2) (See Figure 3).

12. Secure the Air Chamber to the Water Jacket Assembly with three new Return Springs (Item 17) and Shoulder Screws (Item 16) (See Figure 3).

13. Tighten the Shoulder Screws (Item 16) to 10.42 Ft. Lbs. [14.12 N•m] torque.1414.12 N

14. Support the inner race of the Ball Bearing (Item 8) and press the Friction Disc Hub (Item 1) into the Ball Bearing and Air Chamber (See Figure 3).

15. Install the Retaining Ring (Item 10) (See Figure 3).

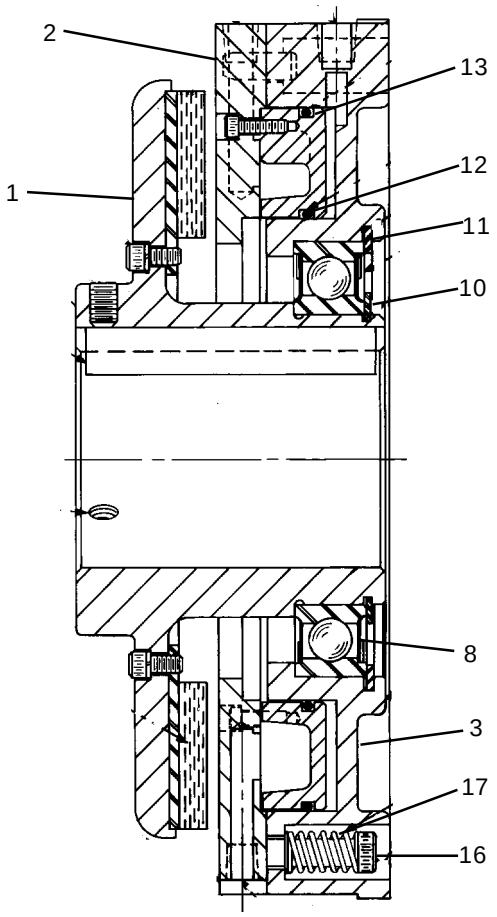

FIGURE 3

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	QTY
1	Friction Disc Hub	1
2	Water Jacket Assembly	1
3	Air Chamber	1
4	Friction Facing	1
5	Key	1
6	Hose Assembly (Not Shown)	2
7	Connector (Not Shown)	2
8	Ball Bearing	1
10	Retaining Ring	1
11	Retaining Ring	1
12	O-ring Seal	1
13	O-ring Seal	1
14	Socket Head Cap Screw	6
15	Set Screw	2
16	Shoulder Screw	3
17	Return Spring	3
18	Lock Washer	6
20	Set Screw	1

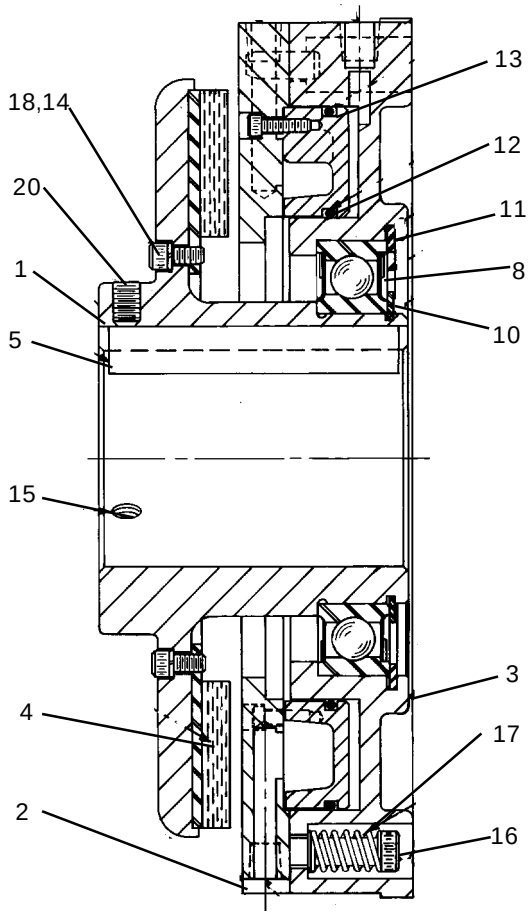

FIGURE 4

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 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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