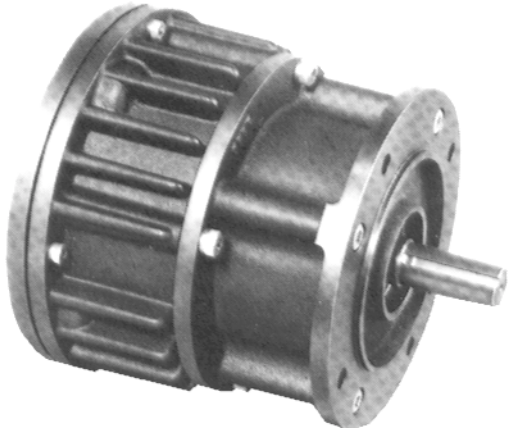
FORM NO. L-20328-A-1099

nexen
formerly Horton Industrial Products
"Air Champ"®

FLANGE MOUNTED ENCLOSED CLUTCH-BRAKES FMCBE MODEL130-24 WITH LOCKING KEY INSTALLATION, OPERATION, AND MAINTENANCE INSTRUCTIONS



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.

CONTENTS

INSTALLATION

CAUTION

This unit is not intended for foot mounting. Flange mount the FMCBE with Locking Key only.

1. Coat the threads of the Bar (Item 38) with Loctite® 242; then, thread the Bar into the Stub Shaft (Item 23) until the end of the Bar is visible in the keyway slot of the Stub Shaft (See Figure 1).

2. Apply a thin film of Never-Seez® to Key (Item 25) (See Figure 1).

3. Place the Key (Item 25) into the keyway of the Stub Shaft (Item 23) (See Figure 1).

4. Slide the FMCBE output shaft into the gear reducer (See Figure 2).

5. Secure the FMCBE to the gear reducer, using customer supplied socket head cap screws, lock washers, and nuts (See Figure 2).

6. Tighten the Bar (Item 38) to 5 Ft. Lbs. [6.8 N•m] to firmly seat the Key (Item 25) in the gear reducer (See Figures 1 and 2).

7. Insert the customer supplied key into the motor shaft keyway (See Figure 2).

8. Secure the FMCBE to the motor using customer supplied socket head cap screws and lock washers; then, tighten the socket head cap screws to 48.3 Ft. Lbs. [65.5 N•m] torque (See Figure 2).

10. Align the tapped hole in the Drive Disc (Item 4) with the hole in the Housing (Item 1) (See Figure 1).

11. Tighten the Set Screw (Item 31) and install the Plug (Item 32) (See Figure 2).

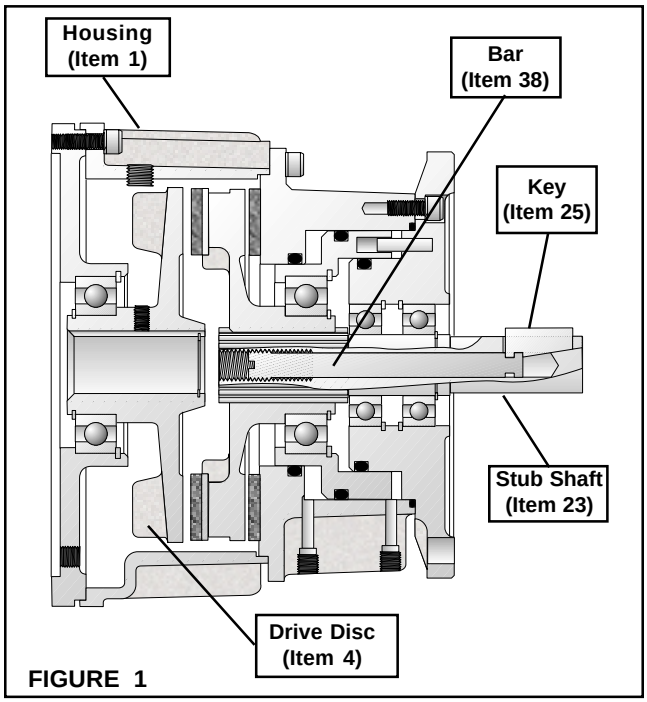


FIGURE 1

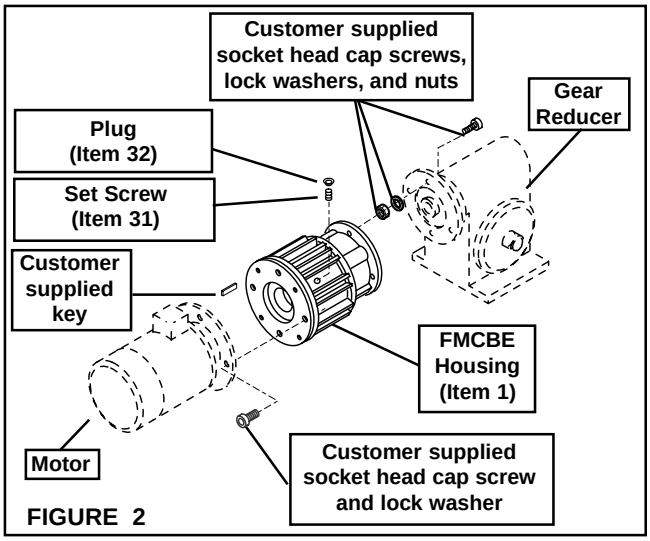


FIGURE 2

AIR CONNECTIONS

NOTE

For quick response, Nexen recommends a quick exhaust valve and short air lines between the Control Valves and the FMCBE. Align the air 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).

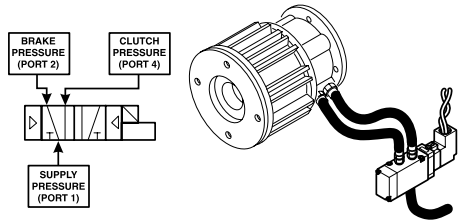


FIGURE 3

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 air supply line to the port marked **3** and other air pressure supply line to the port marked **5** (See Figure 4).

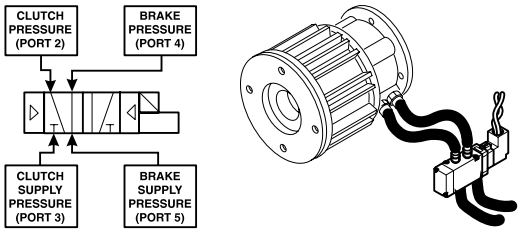


FIGURE 4

3-WAY CONTROL VALVES

3-Way Normally Open (N.O.) and Normally Closed (N.C.) Control Air Inlet Mounts

1. Install 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 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.

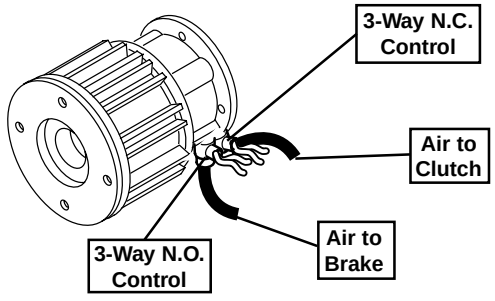


FIGURE 5

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 Clutch/Brakes 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 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 counterclockwise until closed.
7. Turn the Lubricator Adjustment Knob clockwise one-third turn.
8. Open the air line to the unit.

TROUBLESHOOTING

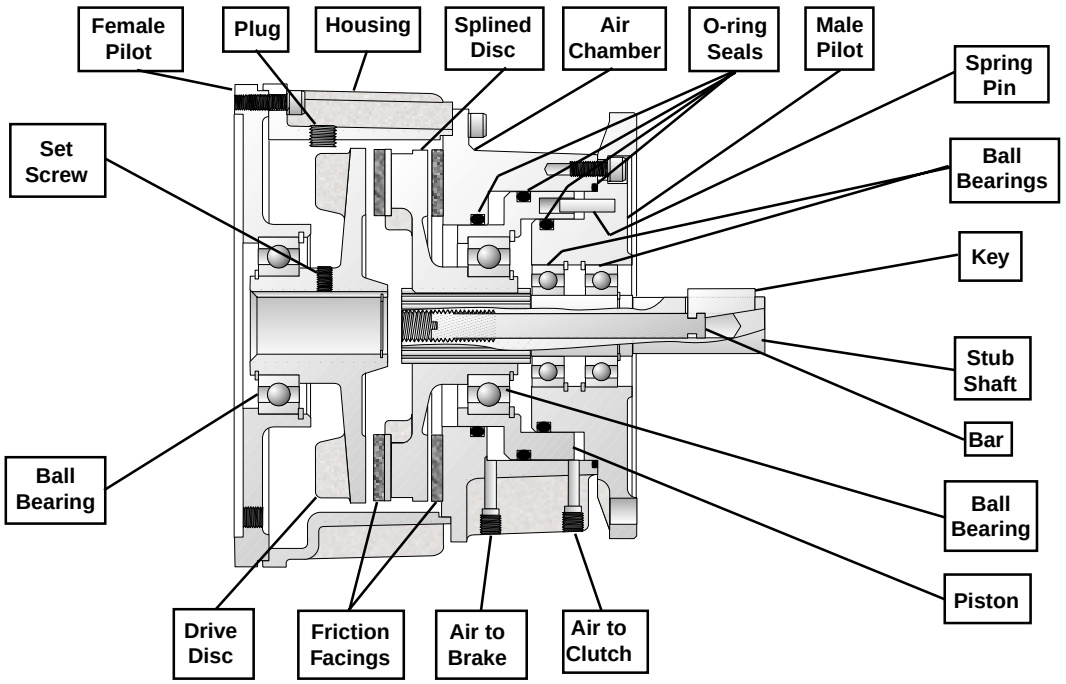


FIGURE 6

SYMPTOM	PROBABLE CAUSE	SOLUTION
Failure to engage.	Air not getting to the FMCBE due to a control valve malfunction.	Check for a control valve malfunction or low air pressure and replace the control valve if necessary.
	Air leaks around the O-ring Seals.	Replace the O-ring Seals.
Failure to disengage.	Unexhausted air due to a control valve malfunction.	Check for a control valve malfunction and replace the control valve if necessary.
Loss of torque.	Air leaks around the O-ring Seals.	Replace the O-ring Seals.
	Worn or dirty Friction Facings.	Replace the Friction Facings.

FMCBE REMOVAL

1. Remove the Plug (Item 32) and loosen the Set Screw (Item 31) securing the FMCBE to the motor or Input Unit (See Figure 7).

2. Remove the socket head cap screws and lock washers that secure the FMCBE to the motor or Input Unit; then, slide the motor or Input Unit off the FMCBE.

CAUTION

Unscrewing the Bar (Item 38) more than one-half turn will damage the bar.

3. Slowly unscrew the Bar (Item 38) one-half turn to release the Key (Item 25).

4. Remove the FMCBE from the gear reducer.

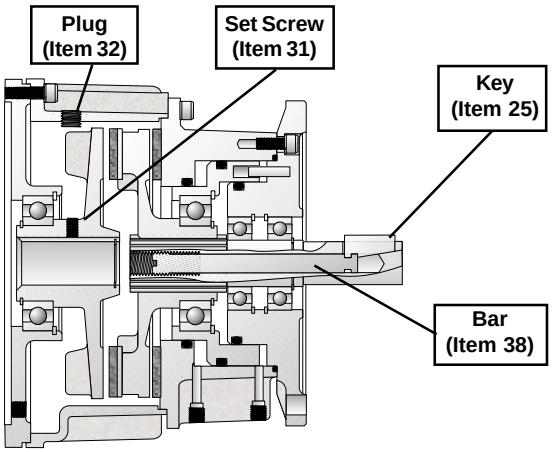


FIGURE 7

PARTS REPLACEMENT–FRICTION FACINGS

NOTE

If an Input Unit is installed on the FMCBE, it must be removed before servicing the FMCBE.

1. Remove the four Socket Head Cap Screws (Item 13) and separate the two halves of the FMCBE (See Figure 8).

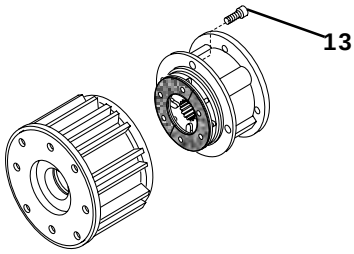


FIGURE 8

NOTE

The Flat Head Machine Screws (Item 7) are assembled with an anaerobic thread locking compound. Inserting a properly fitting screwdriver into the head of the Flat Head Machine Screw and striking the end of the screwdriver with a hammer will break the crystalline structure of the locking compound and allow removal of the Flat Head Machine Screws. Never use an impact wrench to remove the Flat Head Machine Screws.

2. Remove the six old Flat Head Machine Screws (Item 7) and the first old split Friction Facings (Item 11) (See Figure 9).
3. Align the holes in the Splined Disc (Item 10) with the Flat Head Machine Screws (Item 7) that secure the second split Friction Facing (Item 11) (See Figure 9).
4. Remove the six old Flat Head Machine Screws (Item 7) and the second old split Friction Facing (Item 11) (See Figure 9).
5. Install the first new split Friction Facings (Item 11) and new Flat Head Screws (Item 7) (See Figure 9).
6. Tighten the six new Flat Head Machine Screws (Item 7) to 20 In. Lbs. [2.25 N•m] torque.
7. Install the second new split Friction Facings (Item 11) and six new Flat Head Machine Screws (Item 7) (See Figure 9).

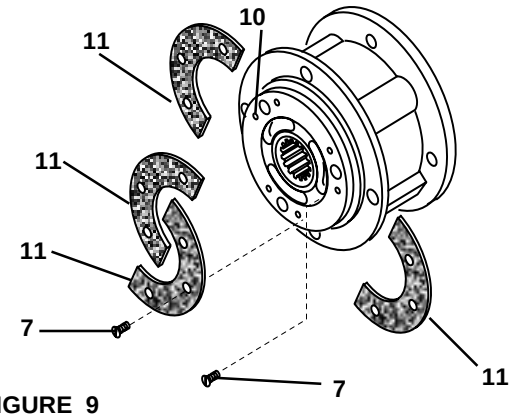


FIGURE 9

8. Tighten the six new Flat Head Machine Screws (Item 7) to 20 In. Lbs. [2.25 N•m] torque.
9. Apply a drop of Loctite® 242 to the threads of the four Socket Head Cap Screws (Item 13) (See Figure 8).
10. Install and tighten the four Socket Head Cap Screws (Item 13) securing the two halves of the FMCBE to 24.5 Ft. Lbs. [33.22 N•m] torque.

PARTS REPLACEMENT–INPUT BEARING

1. Remove the four Socket Head Cap Screws (Item 13) and separate the two halves of the FMCBE (See Figure 10).
2. Remove the four Socket Head Cap Screws (Item 27) (See Figure 11).
3. Remove the Female Pilot (Item 26) from the Housing (Item 1) (See Figure 11).

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 6) and press the Drive Disc (Item 4) out of Female Pilot (Item 26) (See Figure 11).
5. Remove the Retaining Ring (Item 3) (See Figure 11).
6. Fully supporting the Female Pilot (Item 26), press the old Ball Bearing (Item 2) out of the Female Pilot (See Figure 11).

NOTE

Do not reuse bearing. Applying force on inner bearing race to remove bearing held by outer race causes damage to bearing.

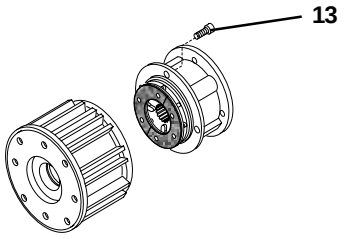


FIGURE 10

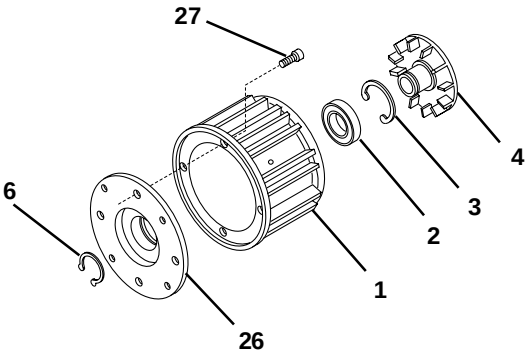


FIGURE 11

7. Clean the bearing bore of the Female Pilot (Item 26) with fresh safety solvent, making sure all old Loctite® residue is removed (See Figure 11).

8. Apply an adequate amount of Loctite® 680 to evenly coat the outer race of the new Ball Bearing (Item 2) (See Figure 11).

9. Supporting the Female Pilot (Item 26) and pressing on the outer race of the new Ball Bearing (Item 2), press the new Ball Bearing into the Female Pilot (See Figure 11).

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

11. Support the inner race of the new Ball Bearing (Item 2) and press the Drive Disc (Item 4) into the new Ball Bearing and Female Pilot (Item 26) (See Figure 11).

12. Reinstall the Retaining Ring (Item 6) (See Figure 11).

13. Using the four Socket Head Cap Screws (Item 27), secure the Female Pilot (Item 26) to the Housing (Item 1) (See Figure 11); then, tighten the Socket Head Cap Screws (Item 27) to 126 In. Lbs. [14.24 N•m] torque.

PARTS REPLACEMENT–BEARINGS AND O-RING SEALS

1. Remove the four Socket Head Cap Screws (Item 13) and separate the two halves of the FMCBE (See Figure 12).

2. Remove the four remaining Socket Head Cap Screws (Item 13) and slide the Male Pilot (Item 20), Stub Shaft (Item 23), and the two Ball Bearings (Item 19) out of the Air Chamber (Item 12) (See Figure 13).

3. Remove the old O-ring Seals (Items 21 and 22) from the Male Pilot (Item 20) (See Figure 13).

NOTE

Ensure the Key (Item 25) is removed from Stub Shaft (Item 23).

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 24) and press the Stub Shaft (Item 23) out of the Male Pilot (Item 20) (See Figure 14).

NOTE

The two old Ball Bearings (Item 19) are removed from opposite ends of the Male Pilot (Item 20). Do not remove the Retaining Ring(s) (Item 18) (See Figure 14).

5. Remove the two old Ball Bearings (Item 19) from the Male Pilot (Item 20) (See Figure 14).

6. Clean the bearing bore of the Male Pilot (Item 20) with fresh safety solvent, making sure all old Loctite® residue is removed (See Figure 14).

7. Press one new Ball Bearing (Item 19) onto the Stub Shaft (Item 23) (See Figure 14).

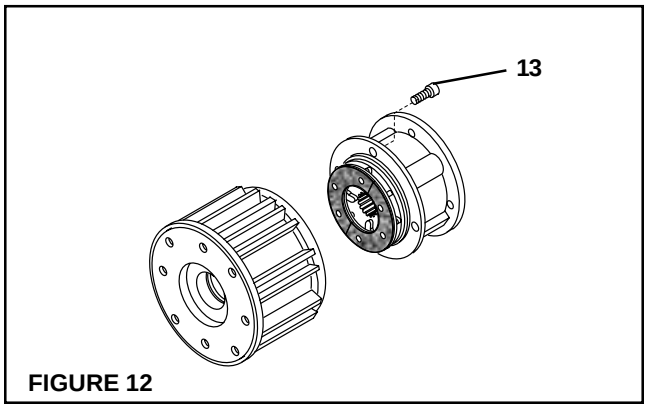


FIGURE 12

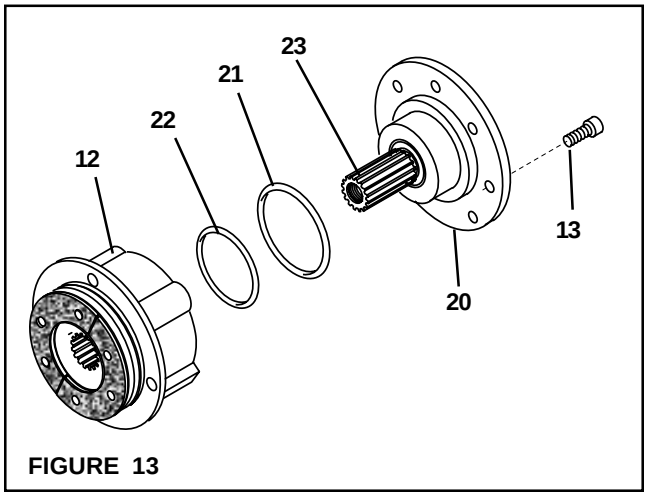


FIGURE 13

8. Apply an adequate amount of Loctite® 680 to evenly coat the outer race of the second new Ball Bearing (Item 19) and press it into the output side of the Male Pilot (Item 20) until it is seated against the first Retaining Ring (Item 18) inside the Male Pilot (See Figure 14).

9. Apply an adequate amount of Loctite® 680 to evenly coat the outer race of the new Ball Bearing (Item 19) pressed onto the Stub Shaft (Item 23). Then, press the new Ball Bearing and Stub Shaft into the Male Pilot (Item 20) until the Ball Bearing is seated against the second Retaining Ring (Item 18) (See Figure 14).

10. Reinstall the Retaining Ring (Item 24) (See Figure 14).

11. Remove the Retaining Ring (Item 6) and press the Splined Disc (Item 10) out of the Air Chamber (Item 12) (See Figure 15).

12. Slide the Piston (Item 16) out of the Air Chamber (Item 2) (See Figure 15).

13. Remove the O-ring Seals (Items 14 and 15) from the Piston (Item 16) and the Air Chamber (Item 12) (See Figure 15).

14. Remove the Retaining Ring (Item 3) from the Piston (Item 16) (See Figure 15).

15. Press the old Ball Bearing (Item 2) out of the Piston (Item 16) (See Figure 15).

16. Clean the bearing bore of the Piston (Item 16) with fresh safety solvent, making sure all old Loctite® residue is removed (See Figure 15).

17. Apply an adequate amount of Loctite® 680 to evenly coat the outer race of the new Ball Bearing (Item 2); then, press the new Ball Bearing (Item 2) into the Piston (Item 16) and reinstall the Retaining Ring (Item 3) (See Figure 15).

18. Lubricate the new O-ring Seals (Items 14 and 15) and the contact surfaces on the Piston (Item 16) and Air Chamber (Item 12) with a thin film of fresh o-ring lubricant (See Figure 15).

19. Install the new O-ring Seals (Items 14 and 15) (See Figure 15).

20. Slide the Piston (Item 16) back into the Air Chamber (Item 12) (See Figure 15).

21. Support the inner race of the Ball Bearing (Item 2) located inside the Piston (Item 16) and press the Splined Disc (Item 10) into the Air Chamber (Item 12) and Piston (Item 16) (See Figure 18).

22. Reinstall the Retaining Ring (Item 6) (See Figure 15).

23. Lubricate the new O-ring Seals (Items 21 and 22) and the contact surfaces on the Male Pilot (Item 20) and Air Chamber (Item 12) with a thin film of fresh o-ring lubricant (See Figure 16).

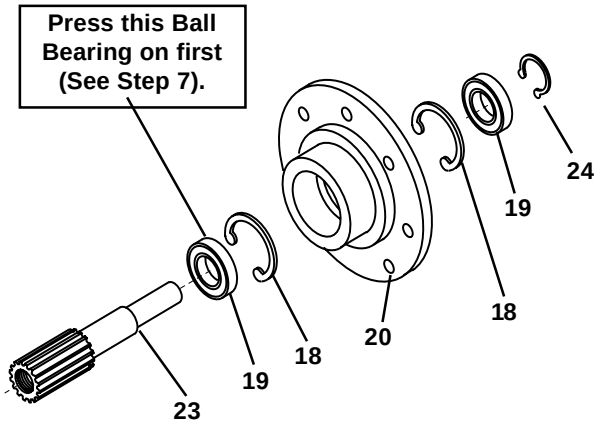


FIGURE 14

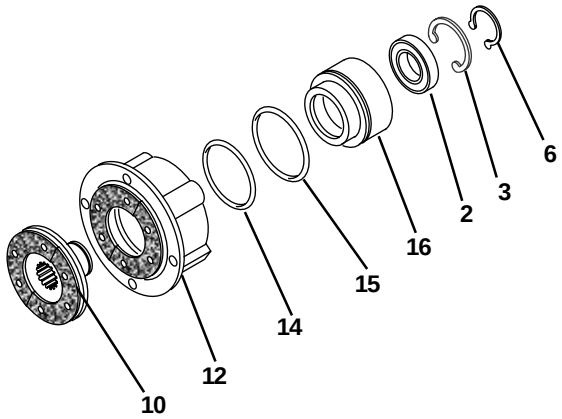


FIGURE 15

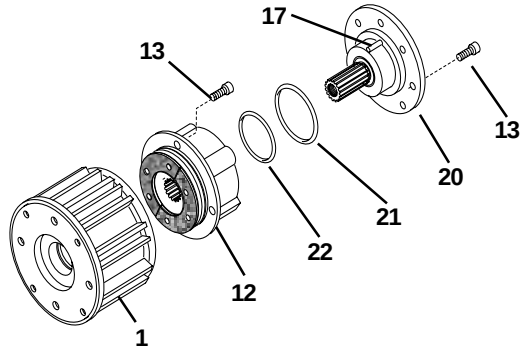


FIGURE 16

24. Install the new O-ring Seals (Items 21 and 22) (See Figure 16).

25. Align the Spring Pin (Item 17) on the Male Pilot (Item 20) with the hole in the Piston (Item 16) and slide the Male Pilot into the Piston and Housing (Item 1) (See Figure 16).

26. Apply a drop of Loctite® 242 to the threads of four Socket Head Cap Screws (Item 13) and secure the Male Pilot (Item 20) to the Air Chamber (Item 12) (See Figure 16).

27. Tighten the four Socket Head Cap Screws (Item 13) to 24.5 Ft. Lbs. [33.22 N•m] torque.

28. Apply a drop of Loctite® 242 to the threads of four Socket Head Cap Screws (Item 13) and secure the Male Pilot (Item 20) and Air Chamber (Item 12) to the Housing (Item 1) (See Figure 16).

29. Tighten the four Socket Head Cap Screws (Item 13) to 24.5 Ft. Lbs. [33.22 N•m] torque.

PARTS REPLACEMENT–INPUT UNIT

NOTE

Remove the Plug (Item 32) and loosen the Set Screw (Item 31) one full turn to release the Input Unit Shaft from the FMCBE.

1. Remove the Socket Head Cap Screws (Item 29), Lock Washers (Item 30), and Hex. Nuts (Item 31); then, remove the Input Unit from the FMCBE.
2. Fully supporting the Input Unit, press the Shaft (Item 28) out of the Input Unit (See Figure 17).
3. Using a bearing puller, remove the Bearing (Item 19) from the Flange (Item 27) (See Figure 17).

NOTE

Do not reuse the old bearing. Applying force to the inner bearing race to remove a bearing held by the outer race causes damage to the bearing.

4. Clean the bearing bore of the Flange (Item 27) with fresh safety solvent, making sure all old Loctite® residue is removed.
5. Apply an adequate amount of Loctite® 680 to evenly coat the outer race of the new Bearing (Item 19) (See Figure 17).
6. Carefully align the outer race of the new Bearing (Item 19) with the bore of the Flange (Item 27) and press the new Bearing into place (See Figure 17).
7. Press the Shaft (Item 28) into the Input Unit (See Figure 17).

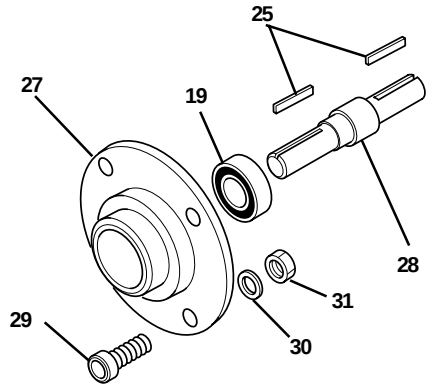


FIGURE 17

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

INPUT UNIT

ITEM	DESCRIPTION	QTY
19[1]	Bearing	1
25	Key	2
27	Flange	1
28	Shaft	1
29	Socket Head Cap Screw	4
30	Lock Washer	4
31	Hex. Nut	4

[1] Denotes Repair Kit item.
FMIU-130 Repair Kit No. 801429.

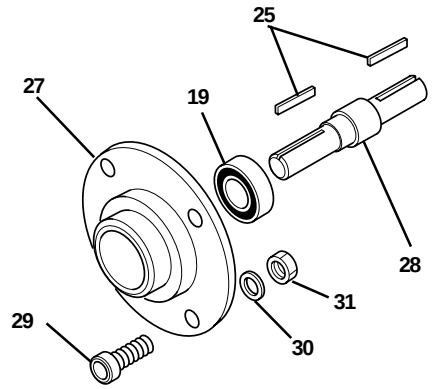


FIGURE 18

FMCBE 130-24

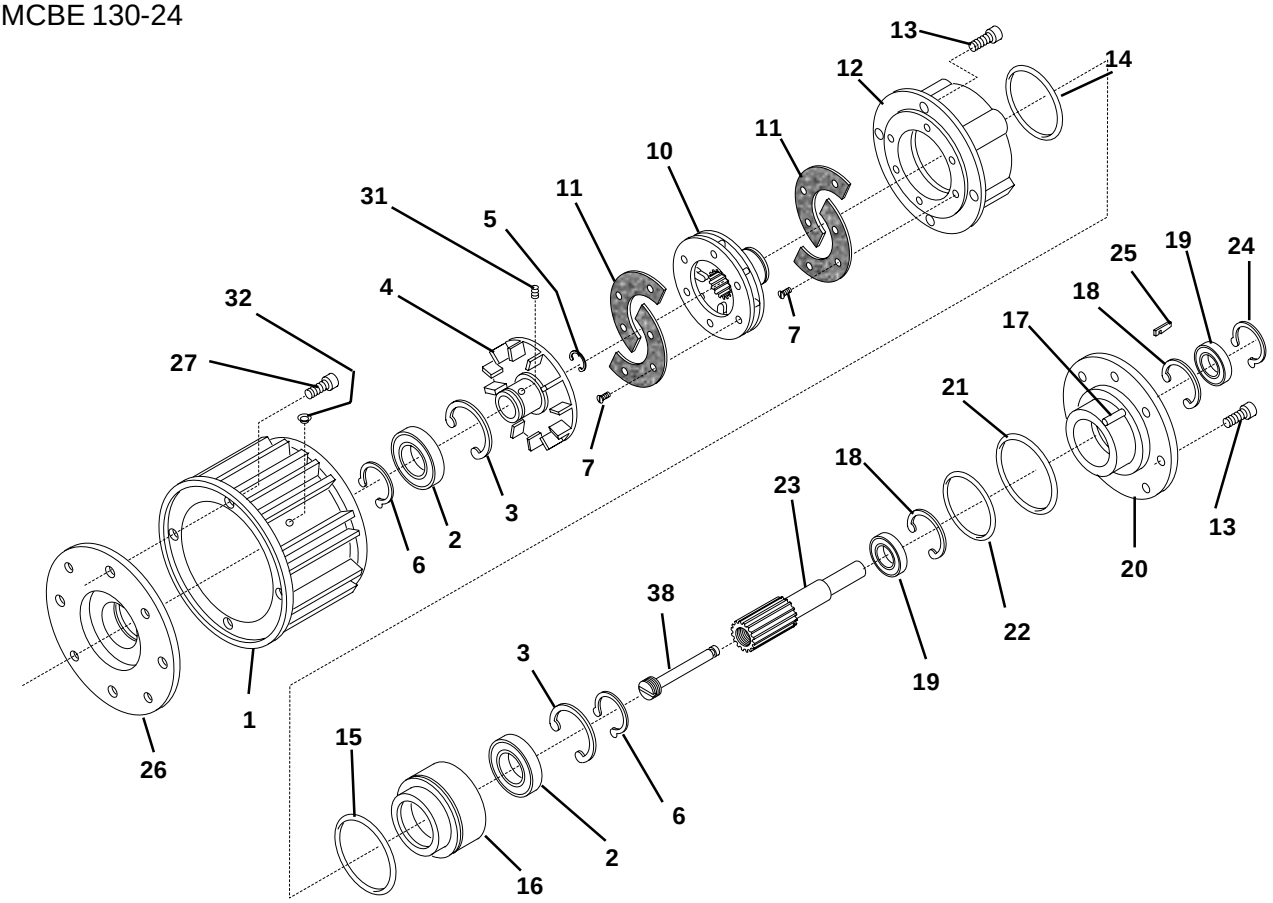


FIGURE 19

ITEM	DESCRIPTION	QTY
1	Housing	1
2[1]	Ball Bearing	2
3	Retaining Ring (Int.)	2
4	Drive Disc	1
5	Retaining Ring (Int.)	1
6	Retaining Ring (Ext.)	2
7[2]	Flat Head Machine Screw	12
10	Splined Disc	1
11[2]	Friction Facing	2
12	Air Chamber	1
13	Socket Head Cap Screw	8
14[1]	O-ring Seal	1
15[1]	O-ring Seal	1
16	Piston	1

ITEM	DESCRIPTION	QTY
17	Spring Pin	1
18	Retaining Ring (Int.)	2
19[1]	Ball Bearing	2
20	Male Pilot	1
21[1]	O-ring Seal	1
22[1]	O-ring Seal	1
23	Stub Shaft	1
24	Retaining Ring (Ext.)	1
25	Key	1
26	Female Pilot	1
27	Socket Head Cap Screw	4
31	Set Screw	1
32	Plug	1
38	Bar	1

[1] Denotes Repair Kit item.
Repair Kit No. 801428.

[2] Denotes Facing Kit item.
Facing Kit No. 801430 (two kits required per unit).

WARRANTY

Nexen Group, Inc. (Nexen) warrants its product(s) [the Product(s)] will be free from defects in materials and workmanship under normal use and service conditions for a period of 12 months from the date of shipment. NO OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED, OR STATUTORY, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY, OR OF FITNESS FOR A PARTICULAR PURPOSE, ARE GIVEN, AND ALL SUCH OTHER WARRANTIES ARE HEREBY EXPRESSLY DISCLAIMED.

Conditions
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) the claimant has complied with the warranty claim procedures set out below in Warranty Claim Procedures.

Exclusive Remedy
The sole and exclusive remedy for a breach of this warrant shall be, at Nexen's sole election, repair or replacement with new, serviceably used or reconditioned Product, or issuance of a credit in the amount of the current Nexen discounted price for the Product.

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 Nexen and deliver the Product to Nexen within one year of the date on which the alleged defect first became apparent.

Nexen Group, Inc.
560 Oak Grove Parkway
Vadnais Heights, MN 55127
800-843-7445
In MN: (651) 484-5900
Fax: (651) 286-1099
www.nexengroup.com

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