nexen®

AIR CHAMP® PRODUCTS

User Manual

FMBES-CC

Models 625, 875, 1125, and 1375

FORM NO. L-20323-D-0300

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

Nexen Group, Inc.
560 Oak Grove Parkway
Vadnais Heights, Minnesota 55127

ISO 9001 Certified

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.

Comply with all applicable codes.

Table of Contents

INSTALLATION

NOTE

The following sections are arranged by model. Verify that you are in the correct section for your model.

FMBES-CC

1. Remove the six Socket Head Cap Screws (Item 11) and separate the two halves of the FMBES-CC.
2. Using four Socket Head Cap Screws (Item 34) and Lock Washers (Item 35), secure the Female Pilot (Item 6) to the motor. Tighten the Socket Head Cap Screws to the recommended torque (See Figure 1 and Table 1).
3. Install the customer supplied key into the motor shaft (See Figure 1).
4. Reassemble the two halves of the FMBES-CC (See Figure 1).
5. Apply a drop of Loctite® 242 to the threads of the six Socket Head Cap Screws (Item 11) (See Figure 1).
6. Reinstall the six Socket Head Cap Screws (Item 11); then, alternately and evenly tighten them to 65 In. Lbs. [7.3 N•m] torque (See Figure 1).
7. Remove Pipe Plug (Item 30) (See Figure 1).
8. Tighten the Set Screw (Item 29) to lock the customer supplied key. Reinstall the Pipe Plug (Item 30) (See Figure 1).

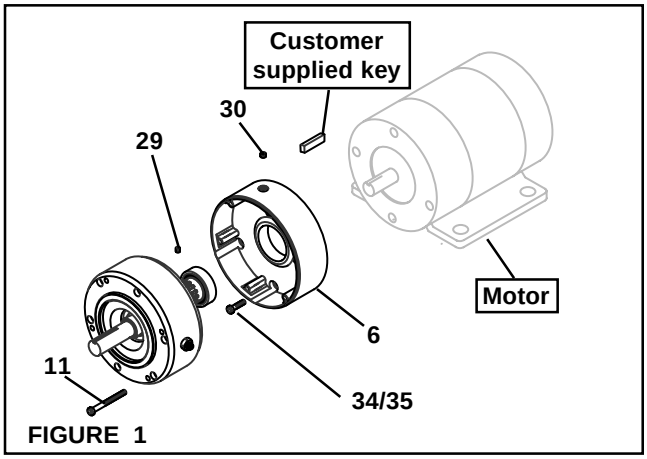


FIGURE 1

RECOMMENDED TORQUE	
MODEL	**ITEM 34**
625	48.3 Ft. Lbs. [65.5 N•m]
875	48.3 Ft. Lbs. [65.5 N•m]
1125	118.75 Ft. Lbs. [161.0 N•m]
1375	118.75 Ft. Lbs. [161.0 N•m]

TABLE 1

AIR CONNECTIONS

NOTE

For quick response, Nexen recommends a quick exhaust valve and short air lines between the Control Valves and the FMBES. Align the air inlet port to a down position to allow condensation to drain out of the Air Chamber of the FMBES.

In high-cyclic applications, Nexen recommends a 50 ms delay between the solenoid valve and the motor starter.

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 FMBES 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 FMBES, 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.

MANUAL RELEASE OPERATION

NOTE

The Manual Release Set Screws (Item 26) must be alternately and evenly tightened to insure proper operation of the Manual Release feature.

1. Loosen the Jam Nuts (Item 27) until they are flush with the tops of the two Set Screws (Item 26) (See Figure 2).

NOTE

Count and record the number of turns required for the Set Screws (Item 26) to disengage the FMBES.

2. Alternately and evenly turn the Set Screws (Item 26) clockwise 1/2 turn at a time until the FMBES is released; then, secure the two Set Screws (Item 26) by turning the Jam Nuts (Item 27) until they are flush with the Housing of the FMBES (See Figure 2).
3. To engage the FMBES alternately and evenly turn the Set Screws (Item 26) counterclockwise the same number of turns required to release the FMBES; then, secure the Set Screws with the Jam Nuts (Item 27) (See Figure 2).

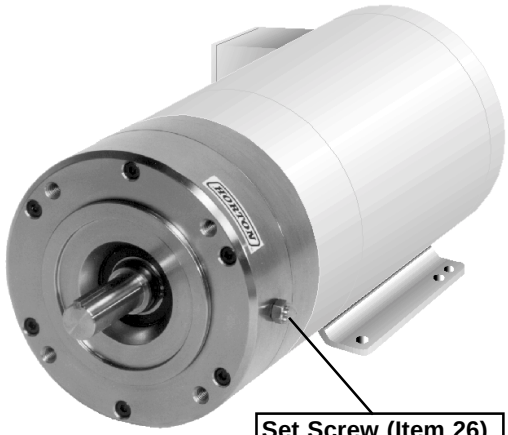
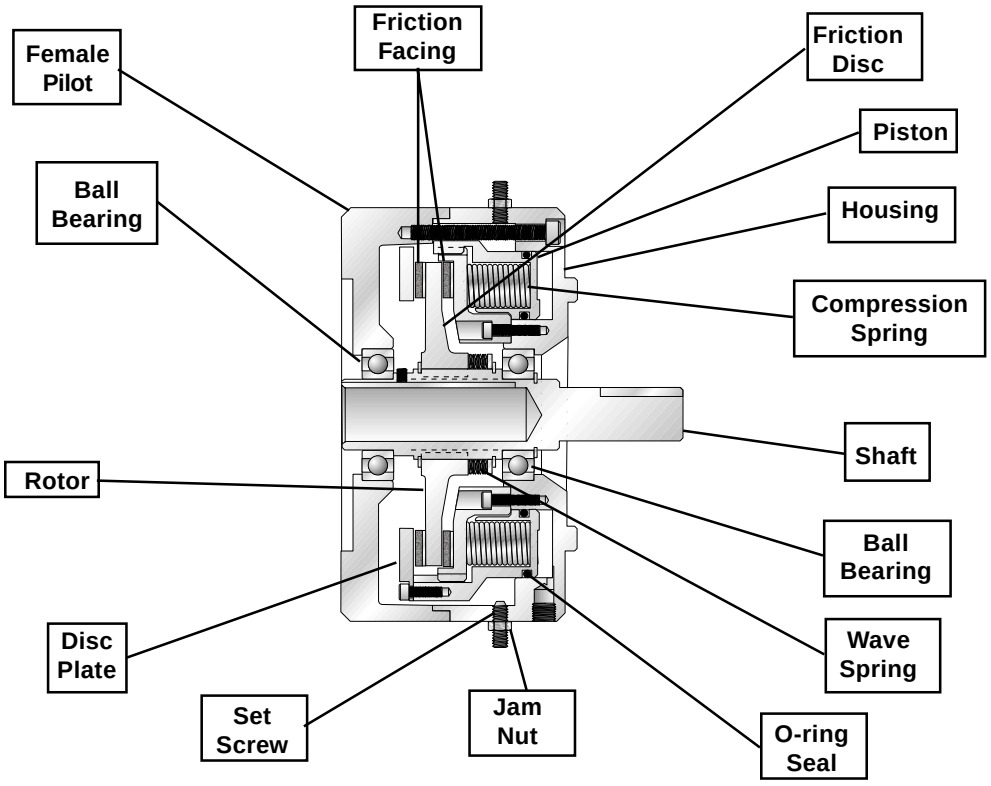


FIGURE 2

TROUBLESHOOTING



TYPICAL FMBES-CC

FIGURE 3

PROBLEM	PROBABLE CAUSE	SOLUTION
Failure to engage.	Broken or weak Compression Springs.	Replace the Compression Springs.
Failure to disengage.	Air not getting to the FMBES due to a control valve malfunction.	Check for a control valve malfunction and replace the control valve if necessary.
	Worn or leaking O-ring Seals.	Replace the O-ring Seals.
	Lack of lubrication on the Hub spline or in the Air Chamber.	Lubricate the Hub spline and/or Air Chamber.
Loss of torque.	Worn or contaminated Friction Facings.	Install new Friction Facings.
	Manual Release engaged.	Disengage Manual Release mechanism.

NOTE

The following sections are arranged by model. Verify that you are in the correct section for your model.

FRICTION FACING—FMBES-CC

1. Remove the six Socket Head Cap Screws (Item 11) (See Figure 4).

2. Remove the Pipe Plug (Item 30); then, loosen the Set Screw (Item 29) (See Figure 4).

3. Separate the two halves of the FMBES-CC (See Figure 4).

CAUTION

The Disc Plate (Item 8) is under pressure from the Compression Springs (Item 14). Alternately and evenly remove the Socket Head Cap Screws (Item 10). Always wear safety goggles when working with spring or tension loaded fasteners or devices.

4. Remove the six Socket Head Cap Screws (Item 10); then, remove the Disc Plate (Item 8) from the Piston (Item 5) (See Figure 4).

NOTE

The Flat Head Machine Screws (Item 13) 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.

5. Remove the six Flat Head Machine Screws (Item 13) and the worn Friction Facing (Item 3) from the Rotor (Item 2) (See Figure 4).

6. Press the Shaft (Item 1), Ball Bearing (Item 9), and Rotor (Item 2) from the Housing (Item 7) (See Figure 5).

7. Remove the six Flat Head Machine Screws (Item 13) and the worn Friction Facing (Item 3) from the Friction Disc (Item 4) (See Figure 5).

8. Install the new Friction Facing (Item 3) to the Friction Disc (Item 4) using the six new Flat Head Machine Screws (Item 13). Tighten the six Flat Head Machine Screws (Item 13) to 20 In. Lbs. [2.2 N•m] torque (See Figure 5).

9. Carefully align the O.D. of the Ball Bearing (Item 9) with the bore of the Housing (Item 7); then, press the Shaft (Item 1), Ball Bearing (Item 9), and Rotor (Item 2) back into the Housing (Item 7) (See Figure 5).

10. Install the new Friction Facing (Item 3) to the Rotor (Item 2) using the six new Flat Head Machine Screws (Item 13); then, alternately and evenly tighten the six Flat Head Machine Screws (Item 13) to 20 In. Lbs. [2.2 N•m] torque (See Figure 6).

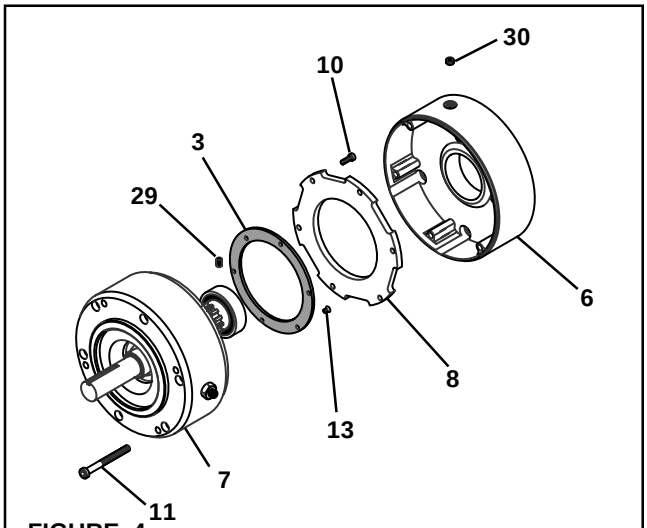


FIGURE 4

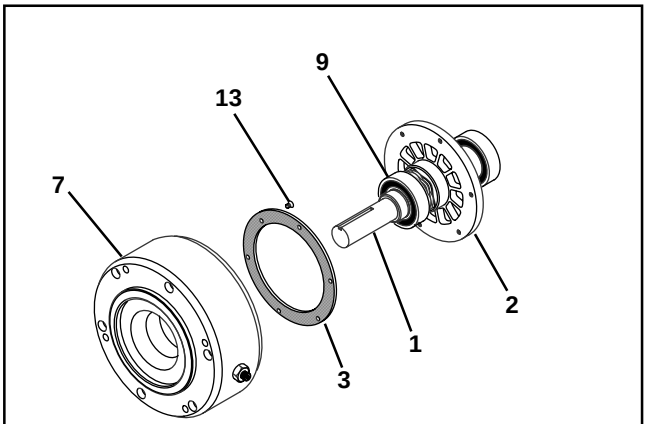


FIGURE 5

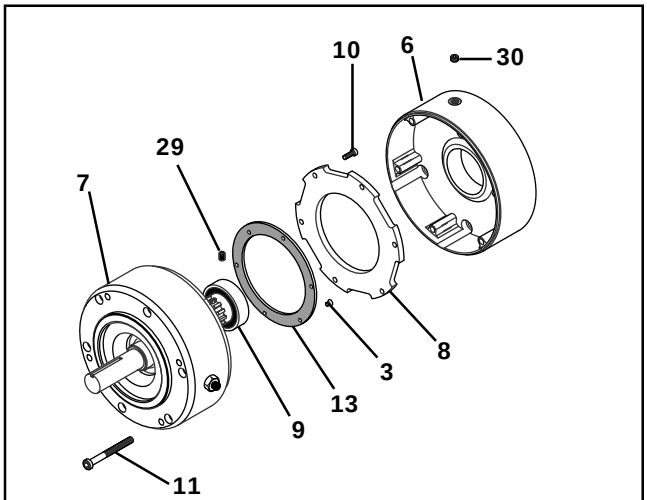


FIGURE 6

11. Secure the Disc Plate (Item 8) to the Piston (Item 5) using the six Socket Head Cap Screws (Item 10); then, alternately and evenly tighten the six Socket Head Cap Screws (Item 10) to 40 In. Lbs. [4.5 N•m] torque (See Figure 7).

12. Reinstall the FMBES-CC, referring to Steps **3** through **8** of INSTALLATION (See Page 1).

BALL BEARINGS, COMPRESSION SPRINGS, WAVED SPRING, AND O-RING SEALS FMBES-CC

1. Remove the six Socket Head Cap Screws (Item 11) (See Figure 7).

2. Remove the Pipe Plug (Item 30); then, loosen the Set Screw (Item 29) (See Figure 7).

3. Separate the two halves of the FMBES-CC (See Figure 7).

CAUTION

The Disc Plate (Item 8) is under pressure from the Compression Springs (Item 14). Alternately and evenly remove the Socket Head Cap Screws (Item 10). Always wear safety goggles when working with spring or tension loaded fasteners or devices.

4. Remove the six Socket Head Cap Screws (Item 10); then, remove the Disc Plate (Item 8) from the Piston (Item 5) (See Figure 7).

5. Press the Shaft (Item 1), Ball Bearing (Item 9), and Rotor (Item 2) from the Housing (Item 7) (See Figure 8).

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.

6. Remove the Retaining Ring (Item 16) from the Shaft (Item 1) (See Figure 9).

7. Press both old Ball Bearings (Item 9) off the Shaft (Item 1) (See Figure 9).

8. Remove the Retaining Ring (Item 15) from the Shaft (Item 1) (See Figure 9).

9. Slide the Washer (Item 18) and Waved Spring (Item 17) from the Shaft (Item 1); then, install the new Waved Spring and reinstall the Washer (See Figure 9).

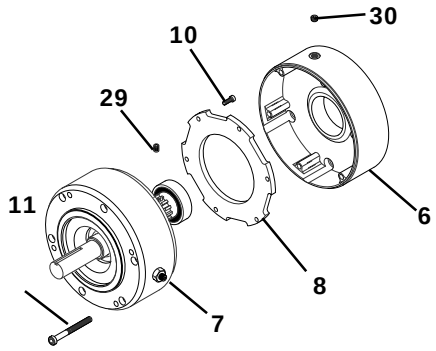


FIGURE 7

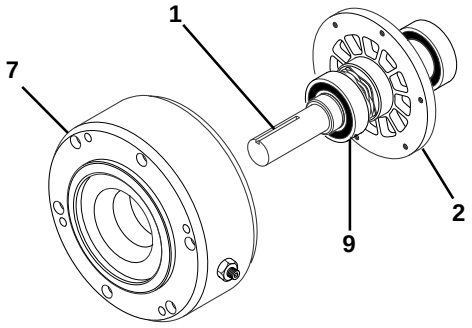


FIGURE 8

10. Reinstall the Retaining Ring (Item 15) (See Figure 9).

11. Pressing on the inner race of the two new Ball Bearings (Item 9), press the new Ball Bearings (Item 9) onto the Shaft (Item 1) (See Figure 10).

12. Reinstall the Retaining Ring (Item 16) (See Figure 9).

WARNING

The Friction Disc (Item 4) is spring loaded. Use 'C' clamps to maintain pressure on the Friction Disc (Item 4) while removing the six Socket Head Cap Screws (Item 12). After the six Socket Head Cap Screws have been removed, slowly release the pressure on the 'C' clamps. Always wear safety goggles when working on spring or tension loaded fasteners or devices.

13. Alternately and evenly remove the six Socket Head Cap Screws (Item 12) (See Figure 10).

14. Slowly release the pressure on the 'C' clamps; then, remove the 'C' clamps.

15. Remove the Friction Disc (Item 4) and old Compression Springs (Item 14) from the Piston (Item 5) (See Figure 10).

WARNING

Do not apply excessive air pressure to slide the Piston (Item 5) out of the Housing (Item 7). Excessive air pressure may result in personal injury or damage to the Piston and Housing.

16. Gently apply air pressure to slide the Piston (Item 5) out of the Housing (Item 7) (See Figure 10).

17. Remove the old O-ring Seals (Items 20 and 21) from the Piston (Item 5) (See Figure 10).

18. Clean the o-ring grooves of the Piston (Item 5) and o-ring contact surfaces of the Housing (Item 7) with fresh safety solvent (See Figure 10).

19. Lubricate the new O-ring Seals (Items 20 and 21) with fresh o-ring lubricant; then, install the new O-ring Seals into the Piston (Item 5) (See Figure 10).

20. Slide the Piston (Item 5) and new O-ring Seals (Items 20 and 21) into the Housing (Item 7) (See Figure 10).

NOTE

Repair Kit No. 827301 contains nine Compression Springs (Item 14). Refer to Table 3 for the correct number of Compression Springs required for your Model FMBES-CC and the required output torque.

21. Install the new Compression Springs (Item 14) into the Piston (Item 5) (See Figure 10).

22. Place the Friction Disc (Item 4) on the Piston (Item 5) and Compression Springs (14); aligning the holes in the Friction Disc with the tapped holes in the Housing (See Figure 10).

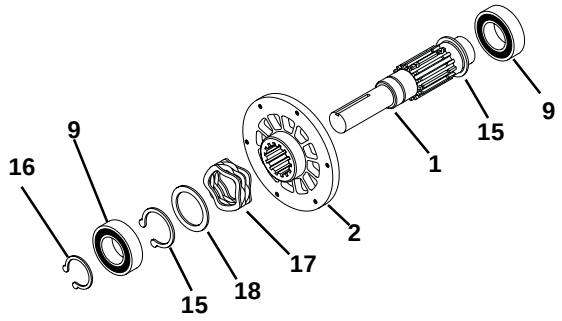


FIGURE 9

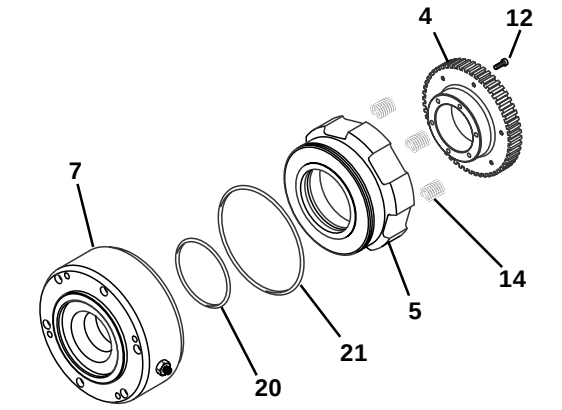


FIGURE 10

23. Using 'C' clamps, press the Friction Disc (Item 4) onto the Piston (Item 5) (See Figure 10).

24. Apply a drop of Loctite® 242 to the threads of the six Socket Head Cap Screws (Item 12) (See Figure 10).

25. Install the six Socket Head Cap Screws (Item 12); then, alternately and evenly tighten the Socket Head Cap Screws (Item 12) to 30 In. Lbs. [3.4 N•m] torque. Remove the 'C' clamps (See Figure 10).

26. Carefully align the O.D. of the Ball Bearing (Item 9) with the bore of the Housing (Item 7); then, press the Shaft (Item 1), Ball Bearing (Item 9), and Rotor (Item 2) back into the Housing (Item 7) (See Figure 12).

NOTE

Apply Loctite 680® to the outer race of the Ball Bearing (Item 9).

27. Apply a drop of Loctite® 242 to the threads of the six Socket Head Cap Screws (Item 10) (See Figure 12).

28. Secure the Disc Plate (Item 8) to the Piston (Item 5) using the six Socket Head Cap Screws (Item 10); then, alternately and evenly tighten the six Socket Head Cap Screws (Item 10) to 40 In. Lbs. [4.5 N•m] torque (See Figure 12).

29. Reinstall the FMBES-CC, referring to Steps **3** through **8** of INSTALLATION (See Page 1).

MODEL	PRODUCT NO.	OUTPUT TORQUE (In. Lbs.)	REQUIRED NUMBER OF SPRINGS
FMBES-CC 625	827323	100 In. Lbs.	3
FMBES-CC 625	827320	200 In. Lbs.	6
FMBES-CC 875	827343	100 In. Lbs.	3
FMBES-CC 875	827344	200 In. Lbs.	6
FMBES-CC 875	827340	300 In. Lbs.	9
FMBES-CC 1125	827360	400 In. Lbs.	9
FMBES-CC 1375	827380	900 In. Lbs.	15

TABLE 3

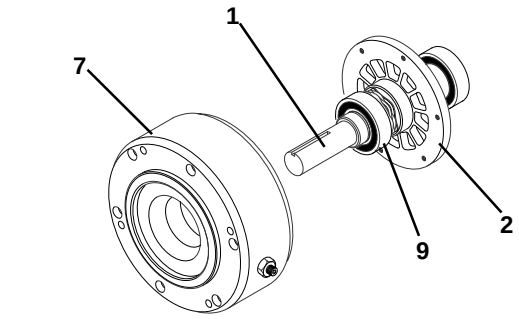


FIGURE 11

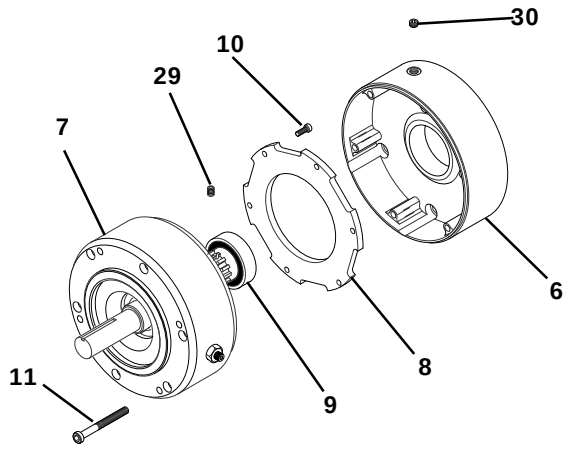


FIGURE 12

PARTS LIST

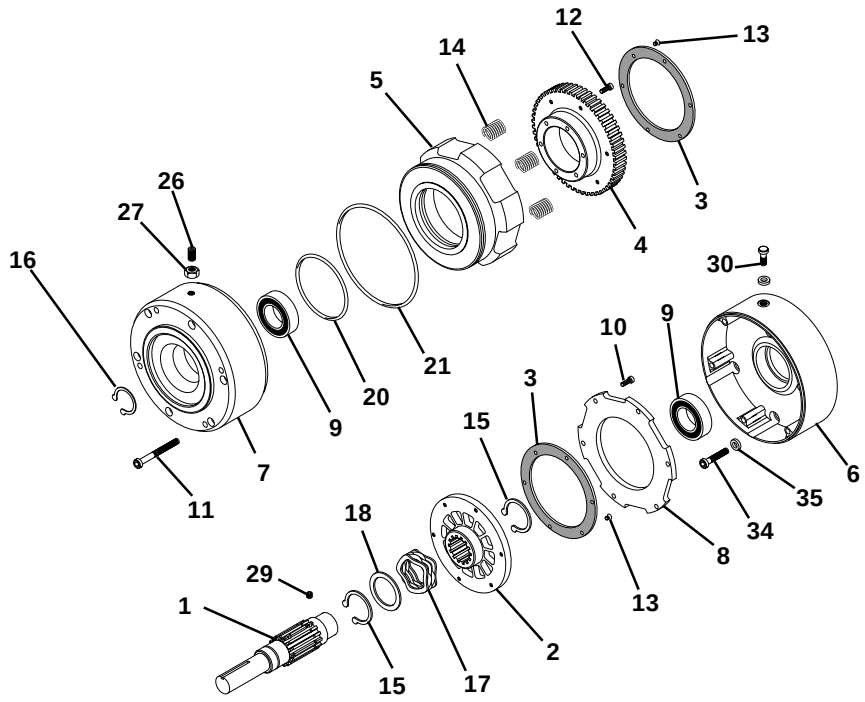


FIGURE 13
FMBES-CC, 625 AND 875

FMBES-CC, 625

ITEM	DESCRIPTION	QTY
1	Shaft	1
2	Rotor	1
3[1,2]	Friction Facing	2
4	Friction Disc	1
5	Piston	1
6	Female Pilot	1
7	Housing	1
8	Disc Plate	1
9[2]	Ball Bearing	2
10	Socket Head Cap Screw	6
11	Socket Head Cap Screw	6
12	Socket Head Cap Screw	6
13[1,2]	Flat Head Machine Screw	12
14[2]	Compression Spring	3, 6
15	Retaining Ring (Ext.)	2
16	Retaining Ring (Ext.)	1
17[2]	Waved Spring	1
18	Washer	1
20[2]	O-ring Seal	1
21[2]	O-ring Seal	1
24	Key (Not Shown)	1
26	Set Screw	2
27	Jam Nut	2
29	Set Screw	1
30	Pipe Plug	1
34	Socket Head Cap Screw	4
35	Lock Washer	4

[1] Denotes Facing Kit item.
Facing Kit Product No. 827302.
[2] Denotes Repair Kit item.
Repair Kit Product No. 827301.

FMBES-CC, 875

ITEM	DESCRIPTION	QTY
1	Shaft	1
2	Rotor	1
3[1,2]	Friction Facing	2
4	Friction Disc	1
5	Piston	1
6	Female Pilot	1
7	Housing	1
8	Disc Plate	1
9[2]	Ball Bearing	2
10	Socket Head Cap Screw	6
11	Socket Head Cap Screw	6
12	Socket Head Cap Screw	6
13[1,2]	Flat Head Machine Screw	12
14[2]	Compression Spring	3, 6, 9
15	Retaining Ring (Ext.)	2
16	Retaining Ring (Ext.)	1
17[2]	Waved Spring	1
18	Washer	1
20[2]	O-ring Seal	1
21[2]	O-ring Seal	1
24	Key (Not Shown)	1
26	Set Screw	2
27	Jam Nut	2
29	Set Screw	1
30	Pipe Plug	1
34	Socket Head Cap Screw	4
35	Lock Washer	4

[1] Denotes Facing Kit item.
Facing Kit Product No. 827302.
[2] Denotes Repair Kit item.
Repair Kit Product No. 827301.

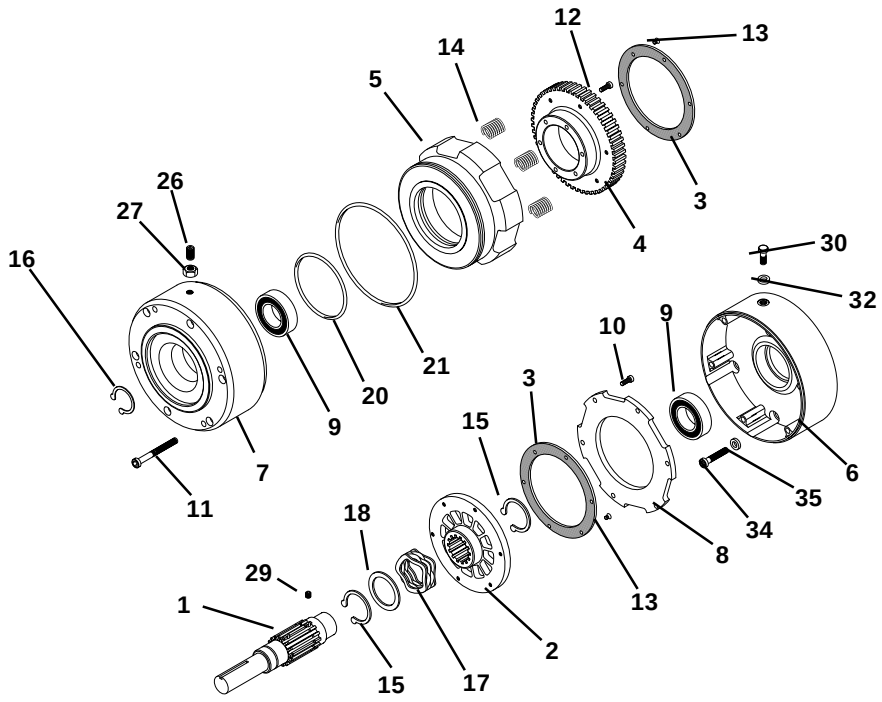


FIGURE 14
FMBES-CC, 1125 AND 1375

FMBES-CC, 1125

ITEM	DESCRIPTION	QTY
1	Shaft	1
2	Rotor	1
3[1,2]	Friction Facing	2
4	Friction Disc	1
5	Piston	1
6	Female Pilot	1
7	Housing	1
8	Disc Plate	1
9[2]	Ball Bearing	2
10	Socket Head Cap Screw	6
11	Socket Head Cap Screw	6
12	Socket Head Cap Screw	6
13[1,2]	Flat Head Machine Screw	12
14[2]	Compression Spring	9
15	Retaining Ring (Ext.)	2
16	Retaining Ring (Ext.)	1
17[2]	Waved Spring	1
18	Washer	1
20[2]	O-ring Seal	1
21[2]	O-ring Seal	1
24	Key (Not Shown)	1
26	Set Screw	2
27	Jam Nut	2
29	Set Screw	1
30	Pipe Plug	1
32	Washer, stato-seal (not shown)	1
34	Socket Head Cap Screw	4
35	Lock Washer	4
36	Socket Head Cap Screw (not shown)	1

[1] Denotes Facing Kit item.
Facing Kit Product No. 827304.
[2] Denotes Repair Kit item.
Repair Kit Product No. 827303.

FMBES-CC, 1375

ITEM	DESCRIPTION	QTY
1	Shaft	1
2	Rotor	1
3[1,2]	Friction Facing	2
4	Friction Disc	1
5	Piston	1
6	Female Pilot	1
7	Housing	1
8	Disc Plate	1
9[2]	Ball Bearing	2
10	Socket Head Cap Screw	6
11	Socket Head Cap Screw	6
12	Socket Head Cap Screw	6
13[1,2]	Flat Head Machine Screw	12
14[2]	Compression Spring	15
15	Retaining Ring (Ext.)	2
16	Retaining Ring (Ext.)	1
17[2]	Waved Spring	1
18	Washer	1
20[2]	O-ring Seal	1
21[2]	O-ring Seal	1
24	Key (Not Shown)	1
26	Set Screw	2
27	Jam Nut	2
29	Set Screw	1
30	Cap Screw	1
32	Washer	1
34	Socket Head Cap Screw	4
35	Lock Washer	4
36	Socket Head Cap Screw (not shown)	1

[1] Denotes Facing Kit item.
Facing Kit Product No. 827304.
[2] Denotes Repair Kit item.
Repair Kit Product No. 827303.

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.

FORM NO. L-20323-D-0300

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®

Nexen Group, Inc.
560 Oak Grove Parkway
Vadnais Heights, MN 55127

800.843.7445
Fax: 651.286.1099
www.nexengroup.com

ISO 9001 Certified

FORM NO. L-20323-D-0300