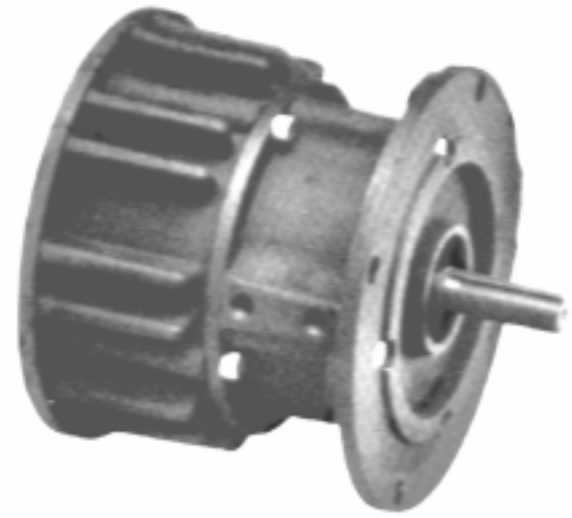
nexen®

AIR CHAMP® PRODUCTS

User Manual



Flange Mounted Enclosed Clutch-Brakes

Models 625, 875, 1125 and 1375

FORM NO. L-20150-P-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.

Technical Support:
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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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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.

INSTALLATION

MOUNTING ON THE SHAFT END OF A MOTOR

NOTE: Model 625 does not have a Female Pilot; proceed with Step 2 for this model.

1. On Models 875, 1125, and 1375, first remove Socket Head Cap Screws (Item 27 on Models 875 and 1125 or Item 13 on Model 1375) and Female Pilot (Item 26); then, secure Female Pilot to the motor face using Socket Head Cap Screws (Item 29) and Lock Washers (Item 30) and tighten them to the recommended torque (See Figure 1 and Table 1).

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

3. Slide the FMCBE onto the motor shaft (See Figure 2).

4. On Model 625, secure the FMCBE to the motor using Socket Head Cap Screws (Item 29) and Lock Washers (Item 30) and tighten them to the recommended torque (See Figure 2 and Table 1).

   Apply a drop of Loctite® 242 to the threads of the Socket Head Cap Screws (Item 27 on Models 875 and 1125 or Item 13 on Model 1375).

   On Models 875, 1125, and 1375, secure the FMCBE Housing (Item 1) to the Female Pilot (Item 26) using Socket Head Cap Screws (Item 27 on Models 875 and 1125 or Item 13 on Model 1375) and tighten them to the recommended torque (See Figure 1 and Table 1).

5. Align the hole in the FMCBE Housing (Item 1) with the tapped hole in the Drive Disc (Item 4) (See Figure 2).

6. Insert and tighten the Set Screw; then, install the Plug (See Figure 2).

   NOTE: On Model 625, the Set Screw is Item 26. On Models 875 and 1125, the Set Screw is Item 31. On Model 1375, the Set Screw is Item 27.

   On Model 625, the Plug is Item 27. On Models 875 and 1125, the Plug is Item 32. On Model 1375, the Plug is Item 28.

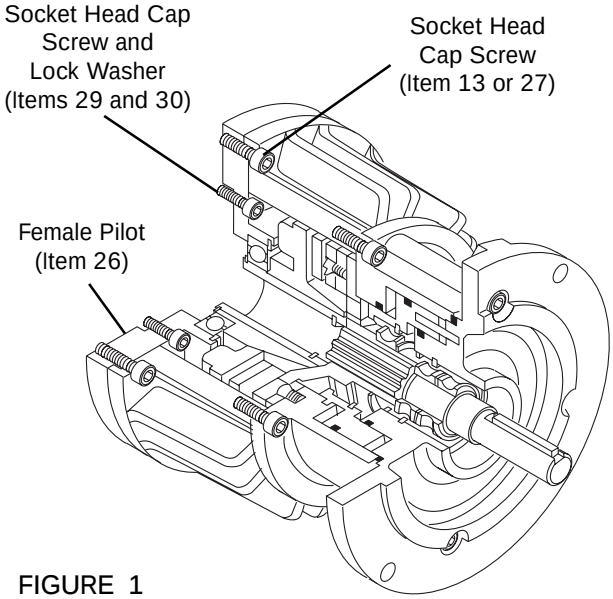

FIGURE 1

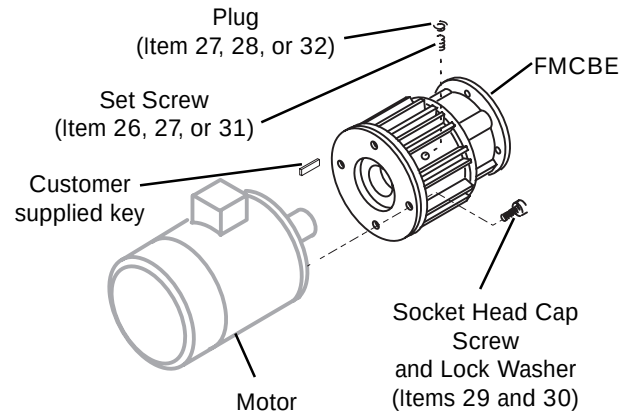

FIGURE 2

TABLE 1
Recommended Tightening Torques

MODEL	ITEM 13	ITEM 27	ITEM 29
625	—	—	580 In. Lbs. [65.5 Nm]
875	—	157 In. Lbs. [17.7 Nm]	580 In. Lbs. [65.5 Nm]
1125	—	267 In. Lbs. [30.2 Nm]	1425 In. Lbs. [161 Nm]
1375	384 In. Lbs. [43.4 Nm]	—	1425 In. Lbs. [161 Nm]

MOUNTING BETWEEN A GEAR REDUCER AND A MOTOR

1. Insert the Key (Item 25) into the output shaft of the FMCBE (See Figure 3).

2. Slide the FMCBE output shaft into the gear reducer (See Figure 3).

3. Secure the FMCBE to the gear reducer, using customer supplied socket head cap screws, lock washers, and nuts (See Figure 3).

   NOTE: Model 625 does not have a Female Pilot; proceed with Step 5 for this model.

4. On Models 875, 1125, and 1375, first remove the Socket Head Cap Screws (Item 27 on Models 875 and 1125 or Item 13 on Model 1375) and Female Pilot (Item 26); then, secure Female Pilot to the motor face using Socket Head Cap Screws (Item 29) and Lock Washers (Item 30) and tighten them to the recommended torque (See Figure 1 and Table 1).

5. Insert the customer supplied key into the motor shaft keyway (See Figure 3).

6. Slide the FMCBE 625 onto the motor shaft (See Figure 3).

7. On Model 625, secure the FMCBE to the motor using Socket Head Cap Screws (Item 29) and Lock Washers (Item 30) and tighten them to the recommended torque (See Figure 2 and Table 1).

   Apply a drop of Loctite® 242 to the threads of the Socket Head Cap Screws (Item 27 on Models 875 and 1125 or Item 13 on Model 1375).

   On Models 875, 1125, and 1375, secure the FMCBE Housing (Item 1) to the Female Pilot (Item 26) using Socket Head Cap Screws (Item 27 on Models 875 and 1125 or Item 13 on Model 1375) and and tighten them to the recommended torque (See Figure 1 and Table 1).

8. Align the hole in the FMCBE Housing (Item 1) with the tapped hole in the Drive Disc (Item 4) (See Figure 3).

9. Insert and tighten the Set Screw and then install the Plug (See Figure 3).

   NOTE: On Model 625, the Set Screw is Item 26. On Models 875 and 1125, the Set Screw is Item 31. On Model 1375, the Set Screw is Item 27.

   On Model 625, the Plug is Item 27. On Models 875 and 1125, the Plug is Item 32. On Model 1375, the Plug is Item 28.

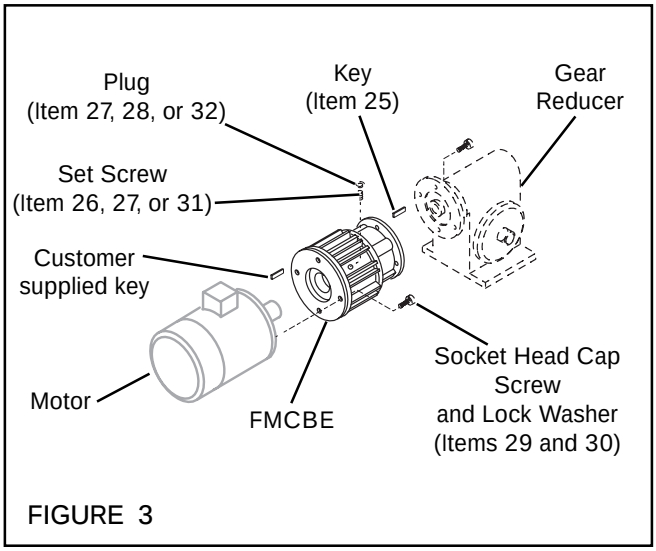

FIGURE 3

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.

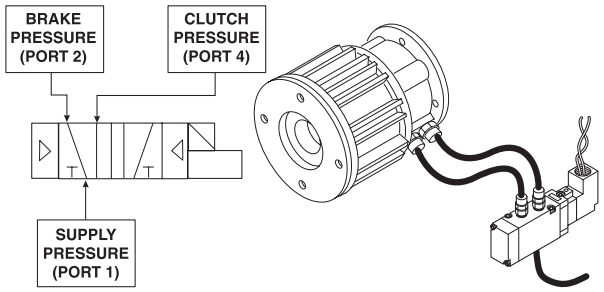

FIGURE 4

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 4).

2. Connect the air supply line to the inlet port (marked 1) (See Figure 4).

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 5).

2. Connect the brake air supply line to the port marked 5 and the clutch air supply line to the port marked 3 (See Figure 5).

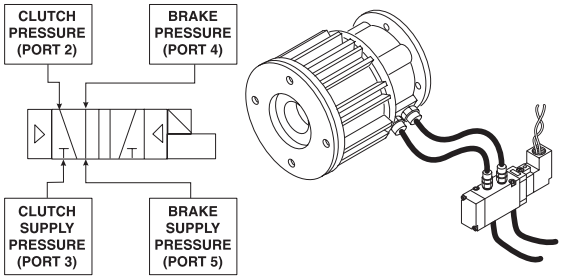

FIGURE 5

3-WAY CONTROL VALVES

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 6).

2. Connect the 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 6).

   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 Control is energized, air flows to the clutch.

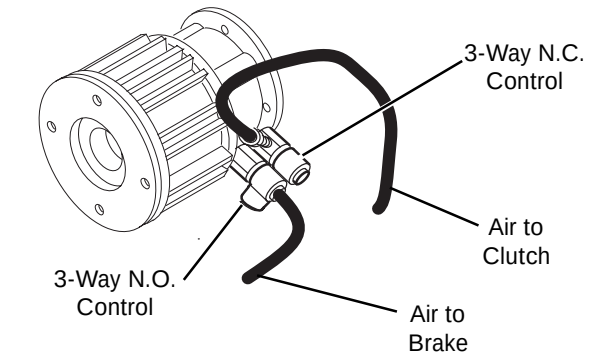

FIGURE 6

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

TROUBLESHOOTING

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.

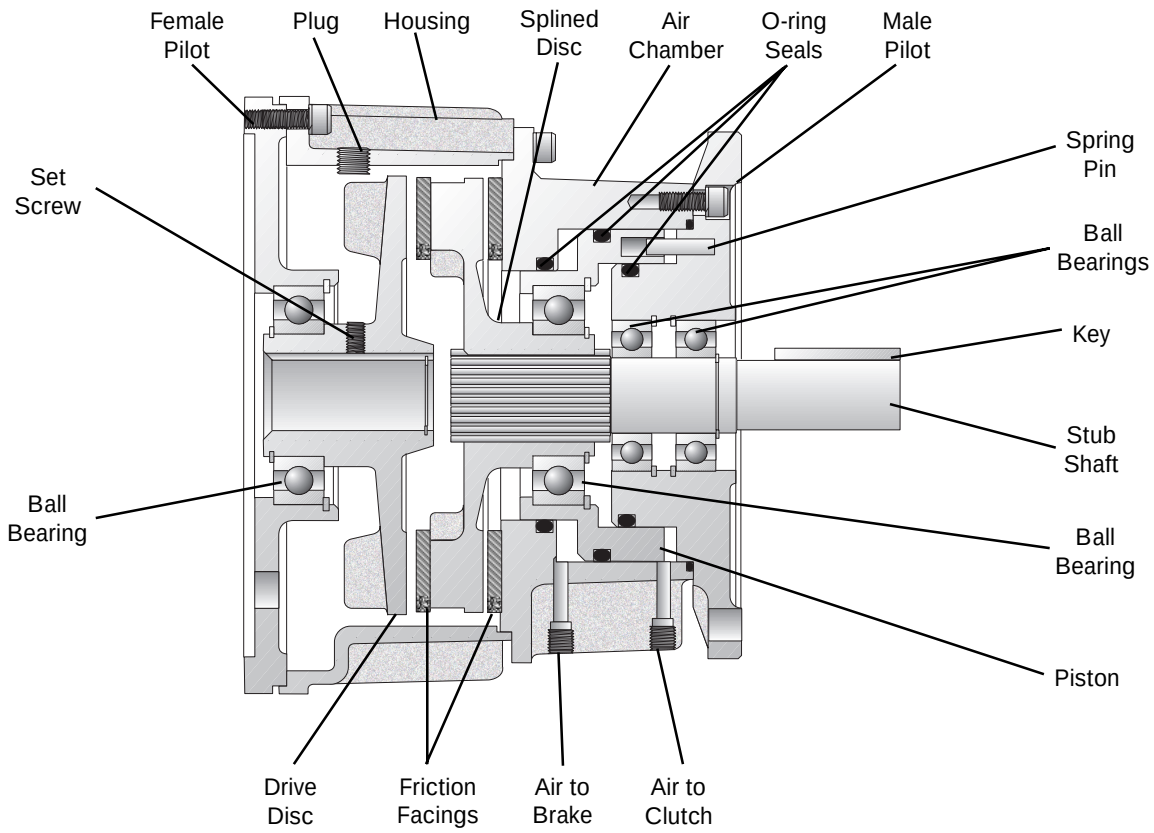

FIGURE 7

MODELS 625, 875, 1125, AND 1375

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

2. Remove the six old Flat Head Machine Screws (Item 7) and the first old split Friction Facing (Item 11) (See Figure 9).

3. Align the holes in the Splined Disc (Item 9) 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 Facing (Item 11) and new Flat Head Machine Screws (Item 7) (See Figure 9).

6. Tighten the six new Flat Head Machine Screws (Item 7) to 20 In. Lbs. [2.26 N•m] torque (See Figure 9).

7. Install the second new split Friction Facing (Item 11) and six new Flat Head Machine Screws (Item 7) (See Figure 9).

8. Tighten the six new Flat Head Machine Screws (Item 7) to 20 In. Lbs. [2.26 N•m] torque (See Figure 9).

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 the recommended torque (See Figure 8 and Table 2).

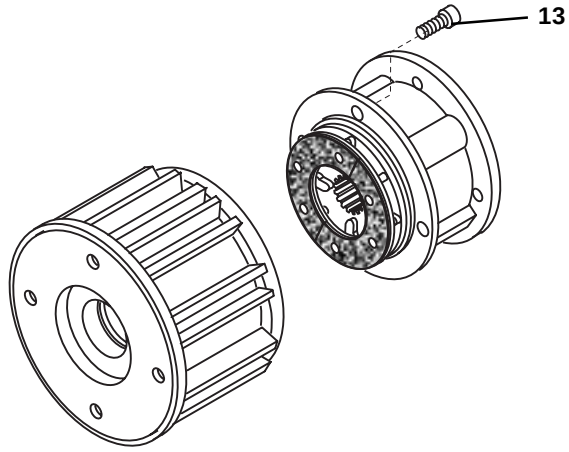

FIGURE 8

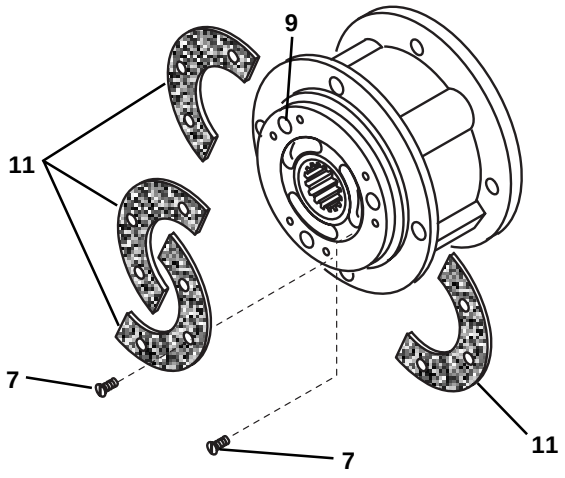

FIGURE 9

TABLE 2

FMCBE MODEL	RECOMMENDED TIGHTENING TORQUE (ITEM 13)
625	157 In. Lbs. [17.7 Nm]
875	267 In. Lbs. [30.2Nm]
1125	267 In. Lbs. [30.2Nm]
1375	594 In. Lbs. [67.1 Nm]

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

MODEL 625 HOUSING

NOTE: If an Input Unit is installed on the FMCBE, it must be removed before servicing the FMCBE. Remove the Plug (Item 27) and loosen the Set Screw (Item 26) to release the FMCBE from the Input Unit (See Figure 11).

1. Remove the four Socket Head Cap Screws (Item 13) and separate the two halves of the FMCBE (See Figure 10).

2. Remove the Plug (Item 27) and Set Screw (Item 26) (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.

3. Remove the Retaining Ring (Item 6) and press the Drive Disc (Item 4) out of Housing (Item 1) (See Figure 11).

4. Remove the Retaining Ring (Item 3) (See Figure 11).

5. Fully supporting the Housing (Item 1), press the old Ball Bearing (Item 2) out of the Housing (See Figure 11).

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

6. Clean the bearing bore of the Housing (Item 1) with fresh safety solvent, making sure all old Loctite® residue is removed (See Figure 11).

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

8. Carefully align the outer race of the new Ball Bearing (Item 2) with the bore of the Housing (Item 1).

9. Supporting the Housing (Item 1) and pressing on the outer race of the new Ball Bearing (Item 2), press the new Ball Bearing into the Housing (See Figure 11).

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

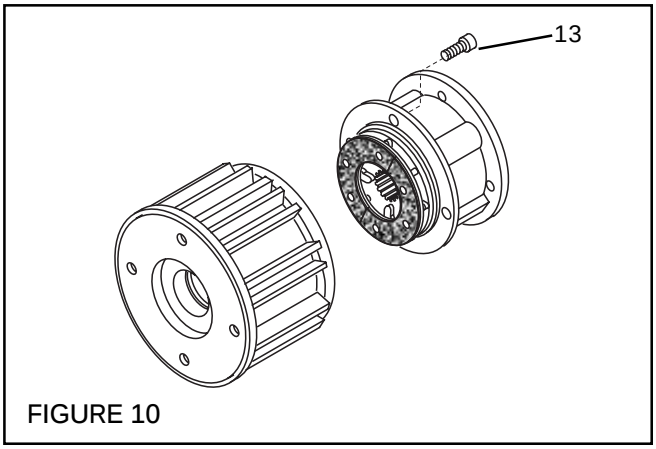

FIGURE 10

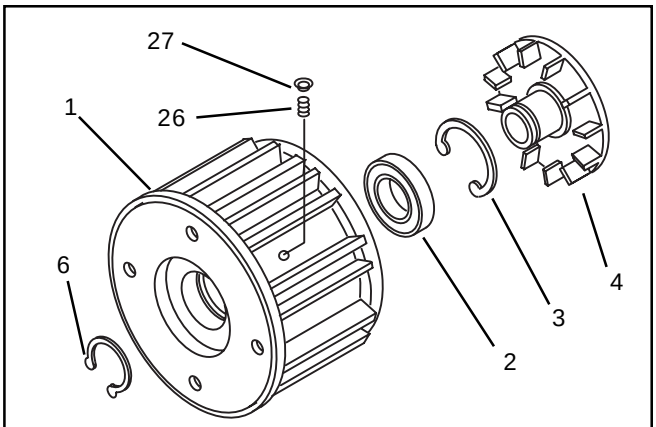

FIGURE 11

11. Support the inner race of the new Ball Bearing (Item 2) and press the Drive Disc (Item 4) into the new Ball Bearing (Item 2) and Housing (Item 1) (See Figure 11).

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

    NOTE: If you are replacing all the Ball Bearings and O-ring Seals in the FMCBE Model 625, proceed with PARTS REPLACEMENT–BEARINGS AND O-RING SEALS; otherwise, proceed with next step.

13. Apply a drop of Loctite® 242 to the threads of the four Socket Head Cap Screws (Item 13) and secure the two halves of the FMCBE together (See Figure 10).

14. Tighten the four Socket Head Cap Screws (Item 13) to 10.5 Ft. Lbs. [14.2 N•m] torque (See Figure 10).

NOTE: If an Input Unit is installed on the FMCBE, it must be removed before servicing the FMCBE. Remove the Plug and loosen the Set Screw to release the FMCBE from the Input Unit (See Figure 13).

On Models 875 and 1125, the Set Screw is Item 31. On Model 1375, the Set Screw is Item 27.

On Models 875 and 1125, the Plug is Item 32. On Model 1375, the Plug is Item 28.

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

2. Remove the Plug and Set Screw (See Figure 13).

   NOTE: On FMCBE Models 875 and 1125 the Socket Head Cap Screws are Item 27.

   On FMCBE Model 1375 the Socket Head Cap Screws are Item 13.

3. Remove the four Socket Head Cap Screws (See Figure 13).

4. Remove the Female Pilot (Item 26) from the Housing (Item 1) (See Figure 13).

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.

5. Remove the Retaining Ring (Item 6) and press the Drive Disc (Item 4) out of Female Pilot (Item 26) (See Figure 13).

6. Remove the Retaining Ring (Item 3) (See Figure 13).

7. Fully supporting the Female Pilot (Item 26), press the old Ball Bearing (Item 2) out of the Female Pilot (See Figure 13).

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

8. Clean the bearing bore of the Female Pilot (Item 26) with fresh safety solvent, making sure all old Loctite® residue is removed (See Figure 13).

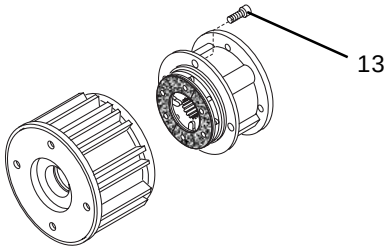

FIGURE 12

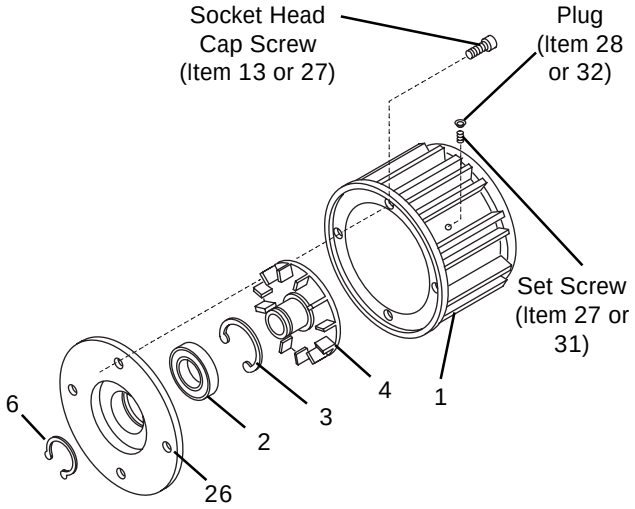

FIGURE 13

TABLE 3

FMCBE MODEL	RECOMMENDED TIGHTENING TORQUE (ITEM 13 or 27)
825	267 In. Lbs. [30.2Nm]
1125	267 In. Lbs. [30.2Nm]
1375	594 In. Lbs. [67.1Nm]

9. Apply an adequate amount of Loctite® 680 to evenly coat the outer race of the new Ball Bearing (Item 2) (See Figure 13).

10. 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 13).

11. Reinstall the Retaining Ring (Item 3) (See Figure 13).

12. Support the inner race of the new Ball Bearing (Item 2) and press the Drive Disc (Item 4) into the new Ball Bearing (Item 2) and Female Pilot (Item 26) (See Figure 13).

13. Reinstall the Retaining Ring (Item 6) (See Figure 13).

    NOTE; On FMCBE Models 875 and 1125, the Socket Head Cap Screws are Item 27. On FMCBE Model 1375, the Socket Head Cap Screws are Item 13.

    Do not tighten the four Socket Head Cap Screws (Item 27 on Models 875 and 1125 and Item 13 on Model 1375).

14. Using the four Socket Head Cap Screws, secure the Female Pilot (Item 26) to the Housing (Item 1) (See Figure 13).

    NOTE: If you are replacing all the Ball Bearings and O-ring Seals in the FMCBE, proceed with PARTS REPLACEMENT–BEARINGS AND O-RING SEALS; otherwise, proceed with next step.

15. Apply a drop of Loctite® 242 to the threads of the four Socket Head Cap Screws (Item 13) and secure the two halves of the FMCBE together (See Figure 12).

16. Tighten the four Socket Head Cap Screws (Item 13) to the recommended torque (See Figure 12 and Table 3).

PARTS REPLACEMENT / PISTON, DRIVE DISC, BEARINGS, AND O-RING SEALS

ALL MODELS

1. Remove the four Socket Head Cap Screws (Item 13) and separate the two halves of the FMCBE (See Figure 14).

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 15).

3. Remove the old O-ring Seals (Items 21 and 22) from the Male Pilot (Item 20) (See Figure 15).

⚠ 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 16).

    NOTE: The two old Ball Bearings (Item 19) are removed from opposite ends of the Male Pilot (Item 20). Do not remove the Retaining Rings (Item 18) (See Figure 16).

5. Remove the two old Ball Bearings (Item 19) from the Male Pilot (Item 20). One Ball Bearing will stay with the Stub Shaft (Item 23) when pressed out (See Figure 16).

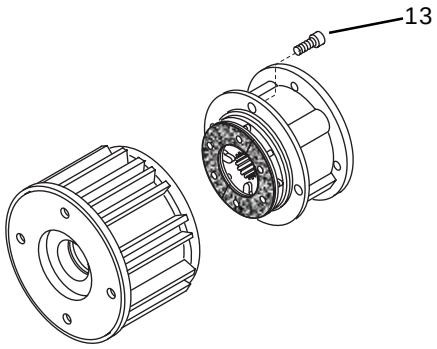

FIGURE 14

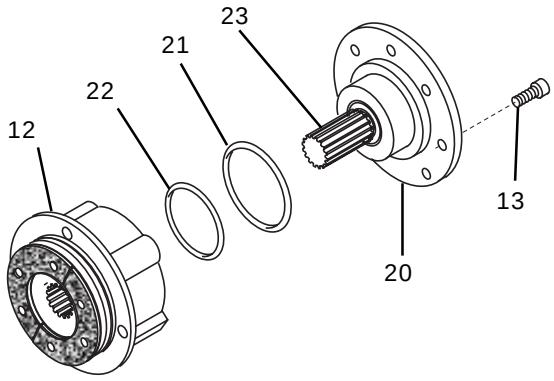

FIGURE 15

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

7. Press one new Ball Bearing (Item 19) onto the Stub Shaft (Item 23) (See Figure 16).

8. 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) and press the new Ball Bearing and Stub Shaft into the Male Pilot (Item 20) until the Ball Bearing is seated against the Retaining Ring (Item 18) (See Figure 16).

9. Apply an adequate amount of Loctite® 680 to evenly coat the outer race of the second new Ball Bearing (Item 19) and press it onto the Stub Shaft (Item 23) and into the Male Pilot (Item 20) until it is seated against the Retaining Ring (Item 18) (See Figure 16).

10. Reinstall the Retaining Ring (Item 24) (See Figure 16).

11. Remove the Retaining Ring (Item 6) and press the Splined Disc (Item 9) out of the Air Chamber (Item 12) (See Figure 17).

12. Slide the Piston (Item 16) out of the Air Chamber (Item 12) (See Figure 17).

13. Remove the O-ring Seals (Items 14 and 15) from the Piston (Item 16) and the Air Chamber (Item 12) (See Figure 17).

14. Remove the Retaining Ring (Item 3) from the Piston (Item 16) (See Figure 17).

15. Press the old Ball Bearing (Item 2) out of the Piston (Item 16) (See Figure 17).

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

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 install the Retaining Ring (Item 3) (See Figure 17).

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 17).

19. Install the new O-ring Seals (Items 14 and 15) (See Figure 17).

20. Slide the Piston (Item 16) back into the Air Chamber (Item 12) (See Figure 17).

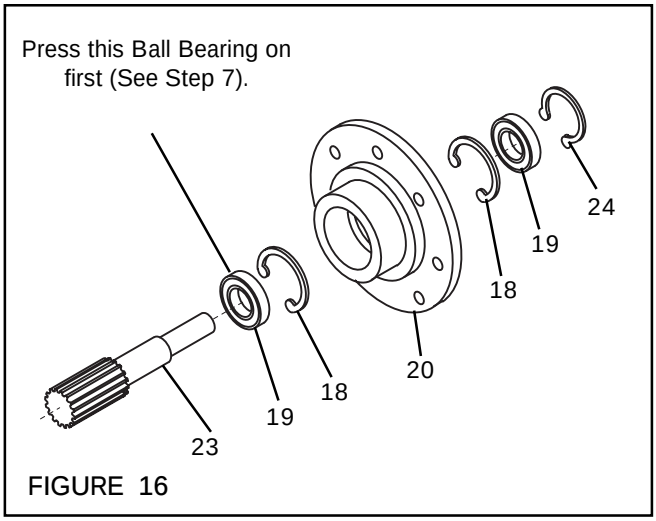

FIGURE 16

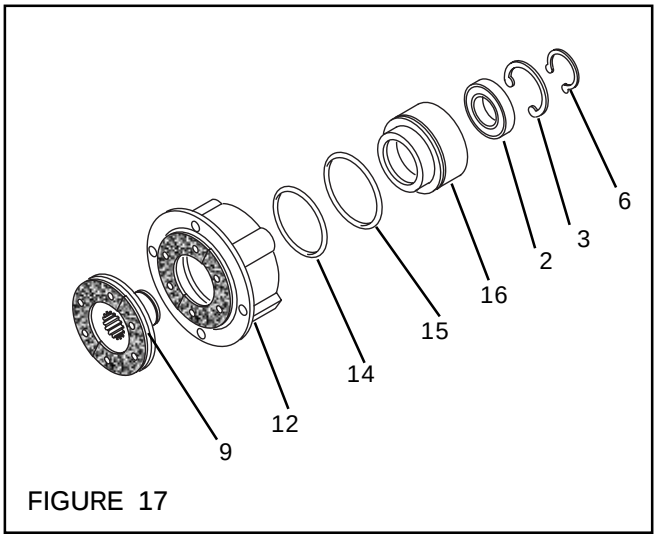

FIGURE 17

21. Support the inner race of the Ball Bearing (Item 2), located inside the Piston (Item 16), and press the Splined Disc (Item 9) into the Air Chamber (Item 12) and Piston (Item 16) (See Figure 17).

22. Reinstall the Retaining Ring (Item 6) (See Figure 17).

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 18).

24. Install the new O-ring Seals (Items 21 and 22) (See Figure 18).

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 Air Chamber (Item 12) (See Figure 18).

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 18).

27. Tighten the four Socket Head Cap Screws (Item 13) to the recommended torque (See Figure 18 and Table 4).

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 18).

29. Tighten the four Socket Head Cap Screws (Item 13) to the recommended torque (See Figure 18 and Table 4).

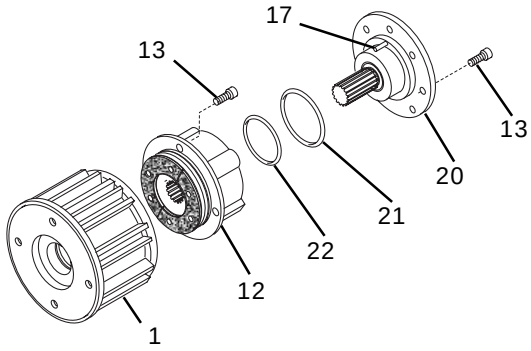

FIGURE 18

TABLE 4

FMCBE MODEL	RECOMMENDED TIGHTENING TORQUE (ITEM 13)
625	157 In. Lbs. [17.7 Nm]
875	267 In. Lbs. [30.2Nm]
1125	267 In. Lbs. [30.2Nm]
1375	594 In. Lbs. [67.1 Nm]

PARTS REPLACEMENT—INPUT UNIT

ALL MODELS

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.

1. Remove the Retaining Ring (Item 35) from the output end of the Input Unit (See Figure 19).

2. Press the Stub Shaft (Item 11) out of the Bearing Flange (Item 20) (See Figure 19).

   NOTE: One old Ball Bearing (Item 30) will come out of the Bearing Flange (Item 20) with the Stub Shaft (Item 11).

3. Press the first old Ball Bearing (Item 30) off the Stub Shaft (Item 11) (See Figure 19).

4. Press the first new Ball Bearing (Item 30) onto the Stub Shaft (Item 11) until it is seated against the Retaining Ring (Item 35) (See Figure 19).

5. Press the second old Ball Bearing (Item 30) out of the Bearing Flange (Item 20) (See Figure 19).

6. Clean the bearing bore of the Bearing Flange with fresh safety solvent, making sure all old Loctite® residue is removed (See Figure 19).

7. Apply an adequate amount of Loctite® 680 to evenly coat the outer race of the first new Ball Bearing (Item 30) on the Stub Shaft (Item 11) and press the first new Ball Bearing and Stub Shaft into the Bearing Flange (Item 20) until the Ball Bearing is seated against the Retaining Ring (Item 58) (See Figure 19).

8. Apply an adequate amount of Loctite® 680 to evenly coat the outer race of the second new Ball Bearing (Item 30) and press the second new Ball Bearing onto the Stub Shaft and into the Bearing Flange (Item 20) until the Ball Bearing is seated against the Retaining Ring (Item 58) (See Figure 19).

9. Reinstall the Retaining Ring (Item 35) (See Figure 19).

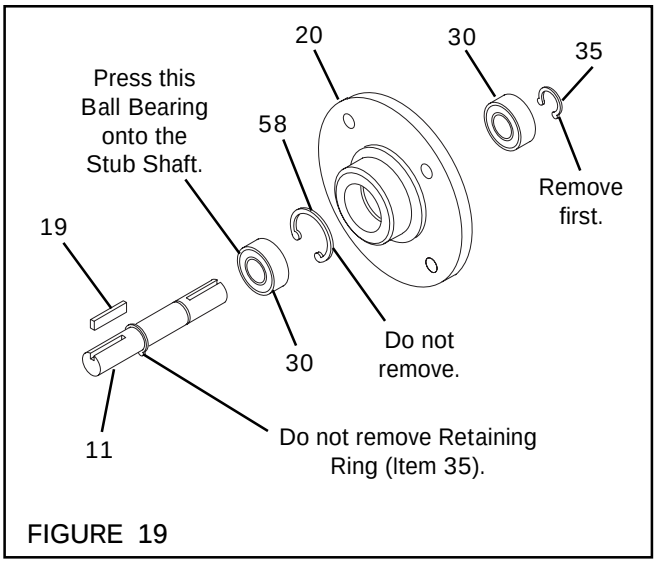

FIGURE 19

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

FMCBE-625

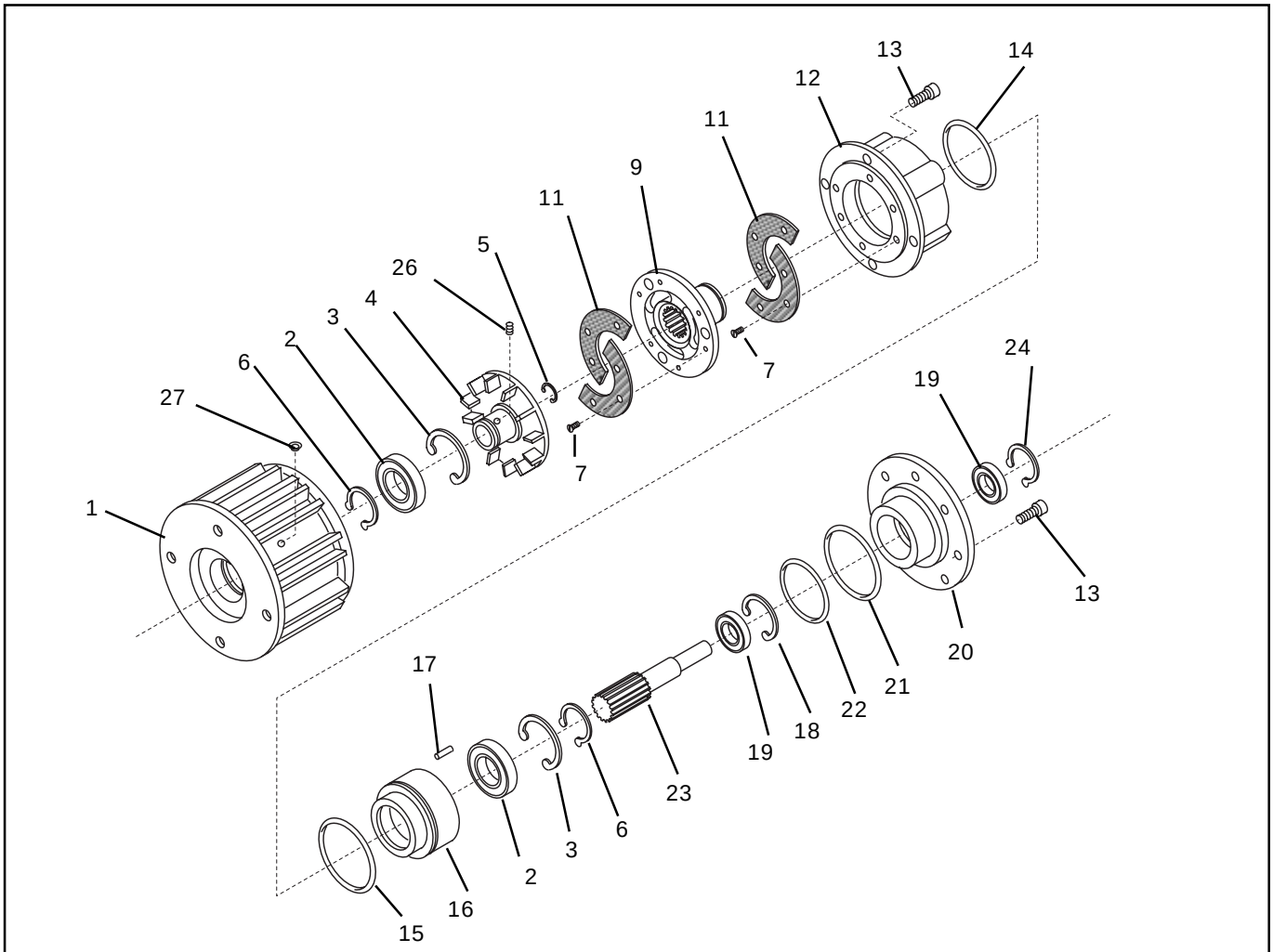

FIGURE 20

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
9	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.)	1
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 (Not Shown)	1
26	Set Screw	1
27	Plug	1
29	Socket Head Cap Screw (Not Shown)	4
30	Lock Washer (Not Shown)	4

[1] Denotes Repair Kit item.
Repair Kit No. 801447.

[2] Denotes Facing Kit item.
Facing Kit No. 801448 (two kits required per unit).

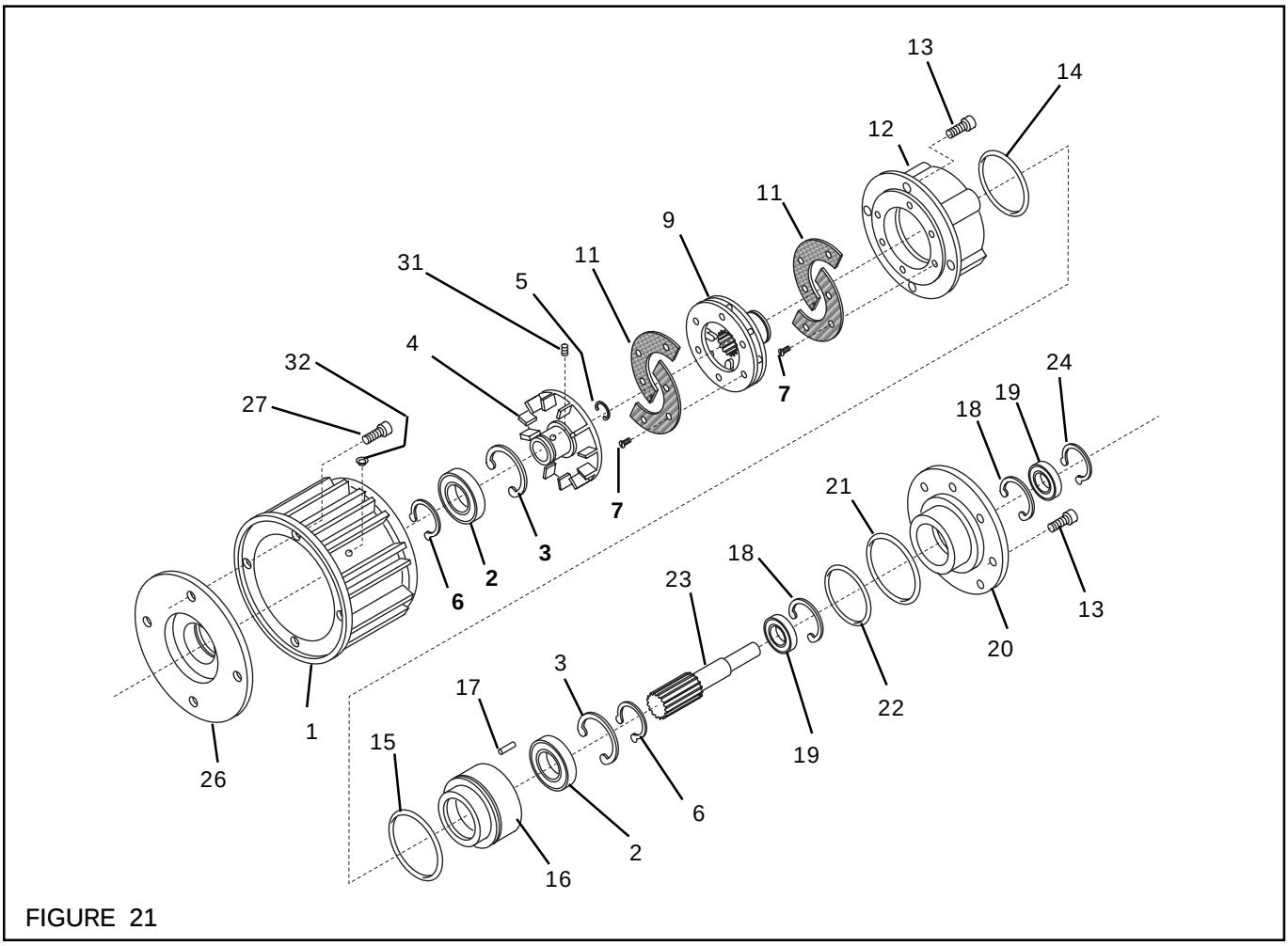

FIGURE 21

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
9	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
17	Spring Pin	1

ITEM	DESCRIPTION	QTY
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 (Not Shown)	1
26	Female Pilot	1
27	Socket Head Cap Screw	4
29	Socket Head Cap Screw (Not Shown)	4
30	Lock Washer (Not Shown)	4
31	Set Screw	1
32	Plug	1

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

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

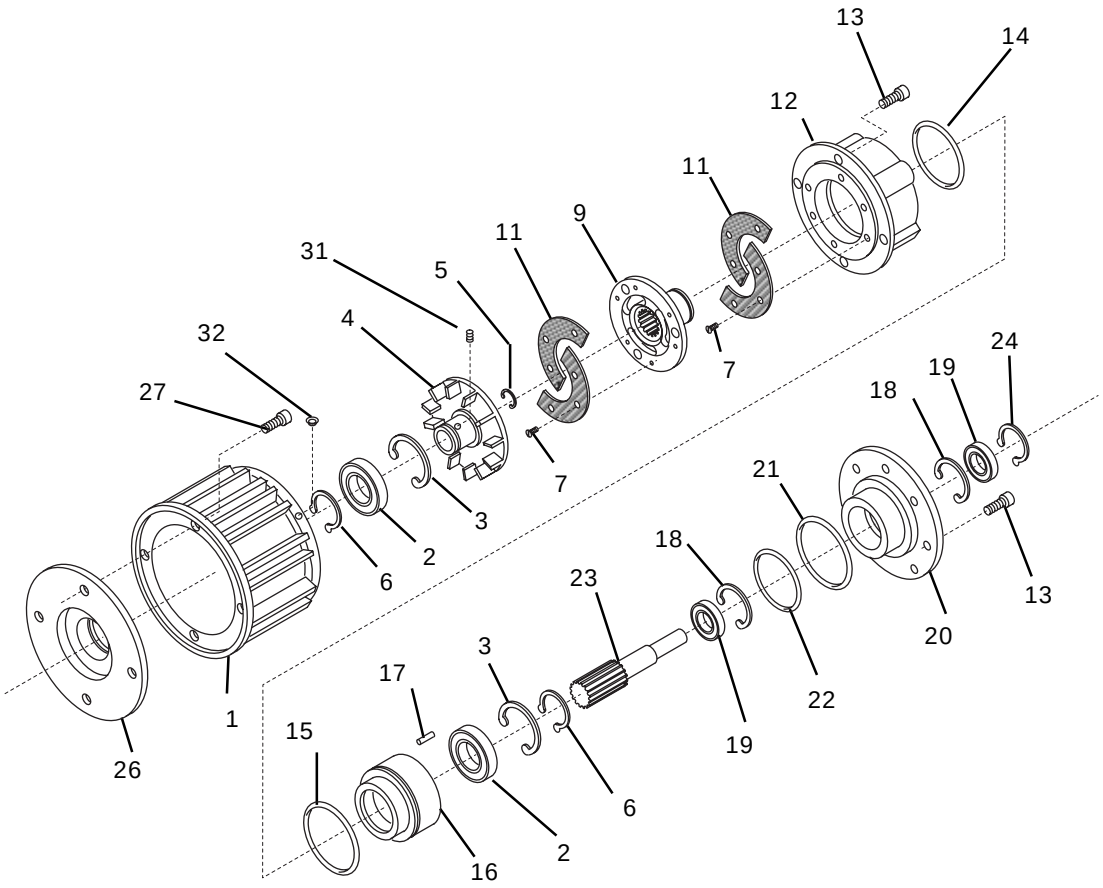

FIGURE 22

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
9	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

[1] Denotes Repair Kit item.
Repair Kit No. 801604.

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 (Not Shown)	1
26	Female Pilot	1
27	Socket Head Cap Screw	4
29	Socket Head Cap Screw (Not Shown)	4
30	Lock Washer (Not Shown)	4
31	Set Screw	1
32	Plug	1

[2] Denotes Facing Kit item.
Facing Kit No. 801605 (two kits required per unit).

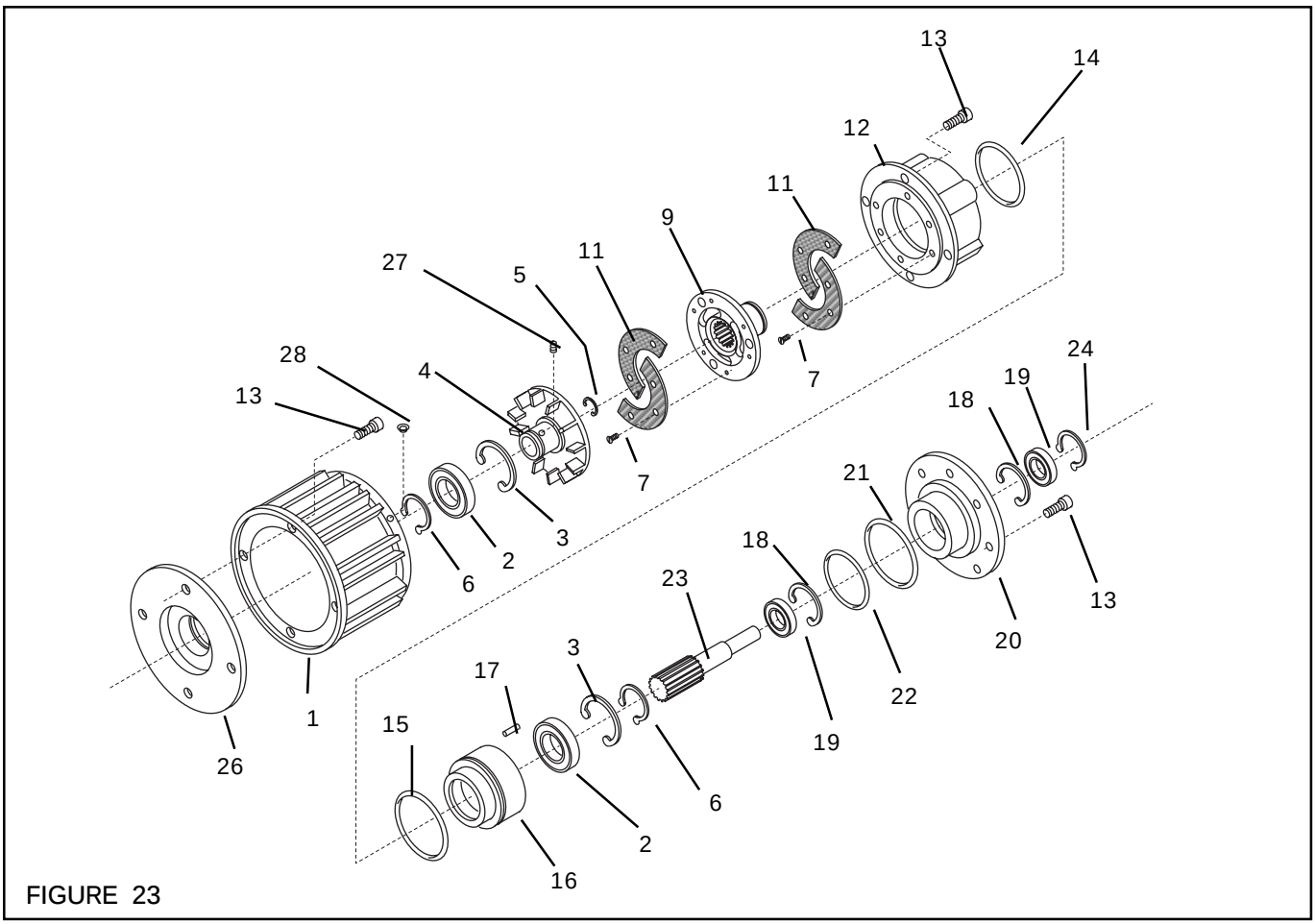

FIGURE 23

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
9	Splined Disc	1
11[2]	Friction Facing	2
12	Air Chamber	1
13	Socket Head Cap Screw	12
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 (Not Shown)	1
26	Female Pilot	1
27	Set Screw	1
28	Plug	1
29	Socket Head Cap Screw (Not Shown)	4
30	Lock Washer (Not Shown)	4

[1] Denotes Repair Kit item.
Repair Kit No. 801651.

[2] Denotes Facing Kit item.
Facing Kit No. 801647 (two kits required per unit).

INPUT UNIT

ITEM	DESCRIPTION	QTY
11	Stub Shaft	1
19	Key	2
20	Bearing Flange	1
30	Ball Bearing	2
35	Retaining Ring	2
45	Hex. Head Jam Nut (Not Shown)	4
58	Retaining Ring	1

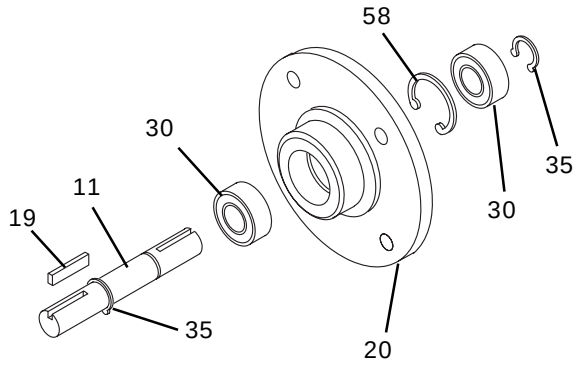

FIGURE 24

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.

nexen

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