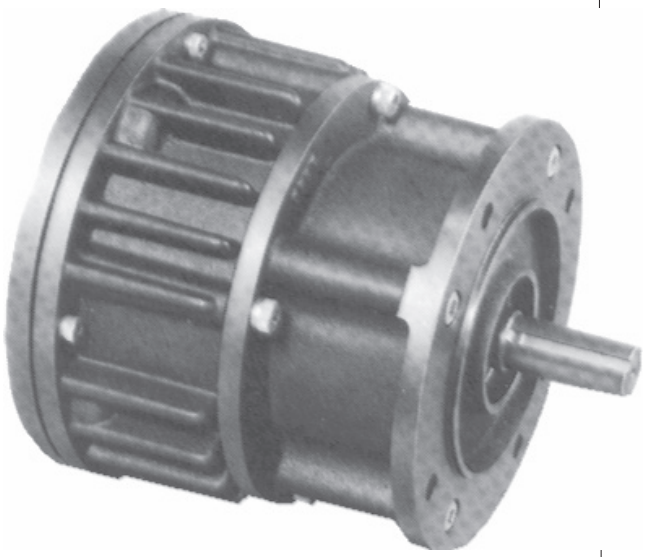
nexen®

AIR CHAMP® PRODUCTS

User Manual



Flange Mounted Enclosed Clutch-Brake

FMCBE 110-14, 130-19, 130-24, 7-28, 7-38, 8-38, and 8-42

CE

RoHS compliant

FORM NO. L-20191-J-0914

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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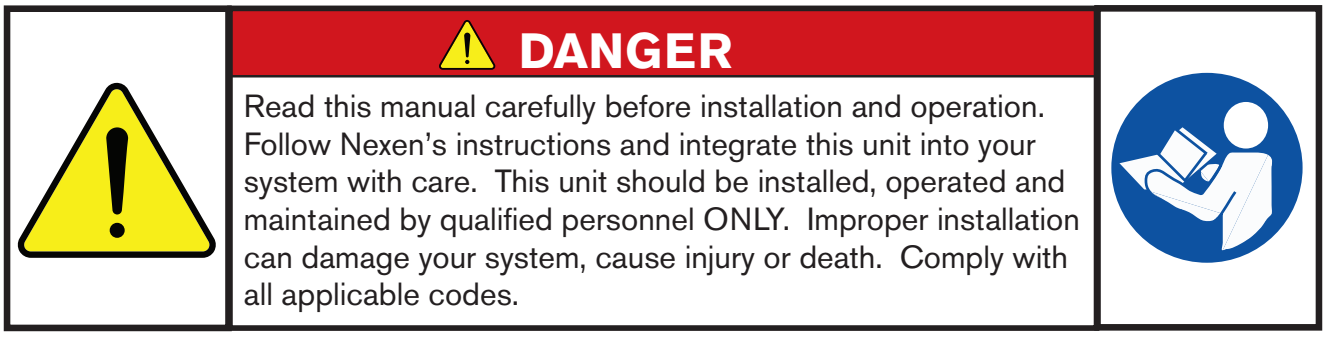


This document is the original, non-translated, version.

Conformity Declaration: In accordance with Appendix II B of CE Machinery Directive (2006/42/EC):

A Declaration of Incorporation of Partly Completed Machinery evaluation for the applicable EU directives was carried out for this product in accordance with the Machinery Directive. The declaration of incorporation is set out in writing in a separate document and can be requested if required.

This machinery is incomplete and must not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the applicable provisions of the Directive.

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

ISO 9001 Certified

Table of Contents

GENERAL SPECIFICATIONS

Specifications	
Torque:	Clutch: 21-226 Nm Brake: 24-271 Nm
Actuation Pressure:	1-80 psi
Service Temperature:	4.5-104C (40-220F)
Approximate Weight:	Up to 155 lbs.

GENERAL SAFETY PRECAUTIONS

⚠ CAUTION

Use lifting aids and proper lifting techniques when installing, removing, or placing this product in service.

⚠ CAUTION

The temperature limits for the product are 4.5-100 degree Celsius (40-220 degree F).

⚠ CAUTION

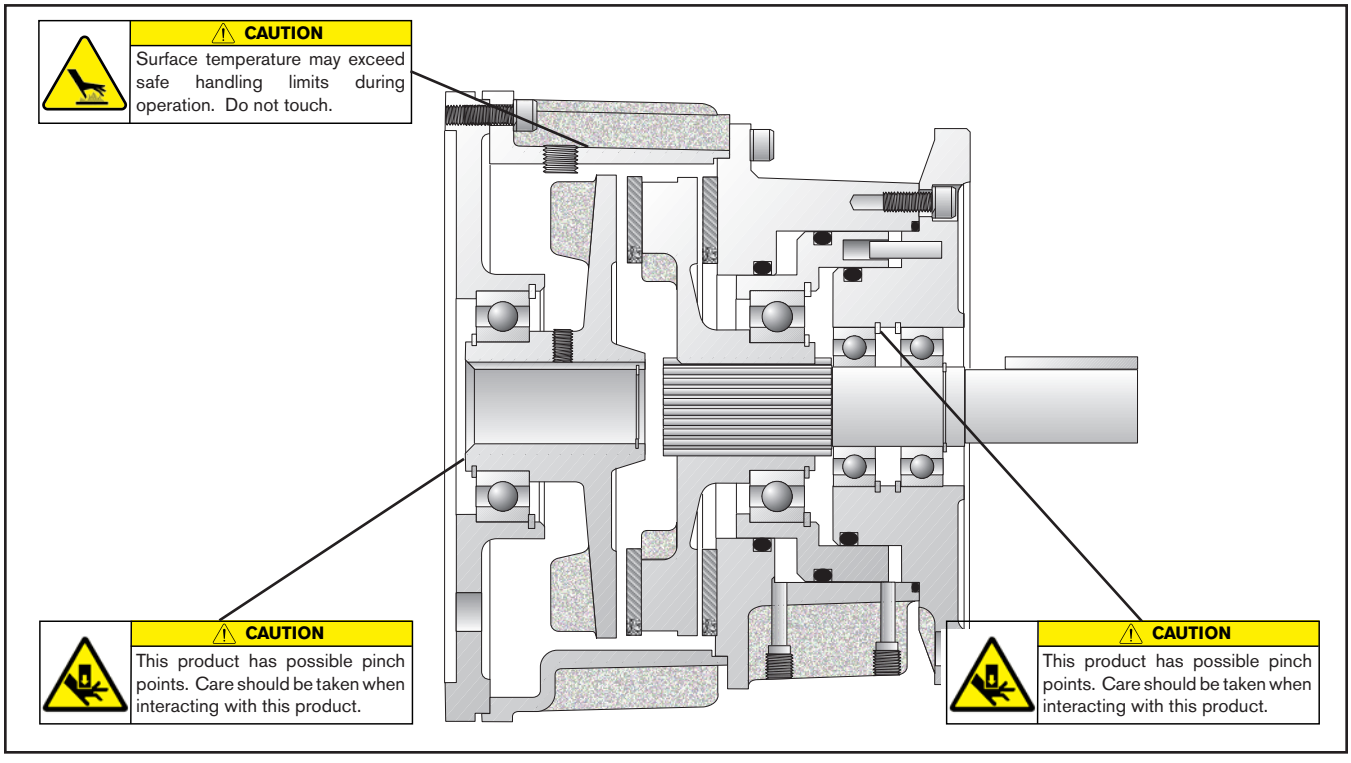
This product has possible pinch points. Care should be taken when interacting with this product.

⚠ CAUTION

Working with spring loaded or tension loaded fasteners and devices can cause injury. Wear safety glasses and take the appropriate safety precautions.

⚠ WARNING

Ensure proper guarding of the product is used. Nexen recommends the machine builder design guarding in compliance with OSHA 29 CFR 1910 “Occupational Safety and Health Hazards”.



INSTALLATION

MOUNTED ON THE SHAFT END OF A MOTOR

Refer to Figure 1.

1. Insert the customer supplied key into the motor shaft keyway.
2. Slide the FMCBE onto the motor shaft, then secure it to the motor using customer supplied socket head cap screws and lock washers.
3. Align the hole in the FMCBE Housing with the Set Screw in the Drive Disc.
4. Tighten the Set Screw and then install the Plug.

NOTE

On Models 110-14, 130-19, and 130-24, the Set Screw is Item 27. On all other Models, the Set Screw is Item 34.

On Models 110-14,130-19, and 130-24, the Plug is Item 28. On all other models, the Plug is Item 35.

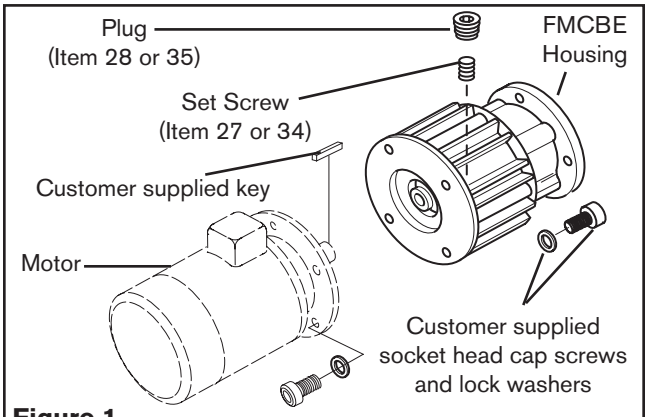


Figure 1

MOUNTED BETWEEN A GEAR REDUCER AND A MOTOR

Refer to Figure 2.

1. Insert the Key (Item 26 or 33) into the output shaft of the FMCBE.

NOTE

On Models 110-14, 130-19, and 130-24, the Key is Item 26. On all other models, the Key is Item 33).

2. Slide the FMCBE output shaft into the gear reducer.
3. Secure the FMCBE to the gear reducer using customer supplied socket head cap screws, lock washers and nuts.
4. Insert the customer supplied key into the motor shaft keyway.
5. Slide the motor into the FMCBE and secure it to the FMCBE using customer supplied socket head cap screws and lock washers.
6. Align the hole in the FMCBE Housing with the Set Screw in the Drive Disc.
7. Tighten the Set Screw and install the Plug.

NOTE

On Models 110-14, 130-19, and 130-24, the Set Screw is Item 27. On all other Models, the Set Screw is Item 34.

On Models 110-14,130-19, and 130-24, the Plug is Item 28. On all other models, the Plug is Item 35.

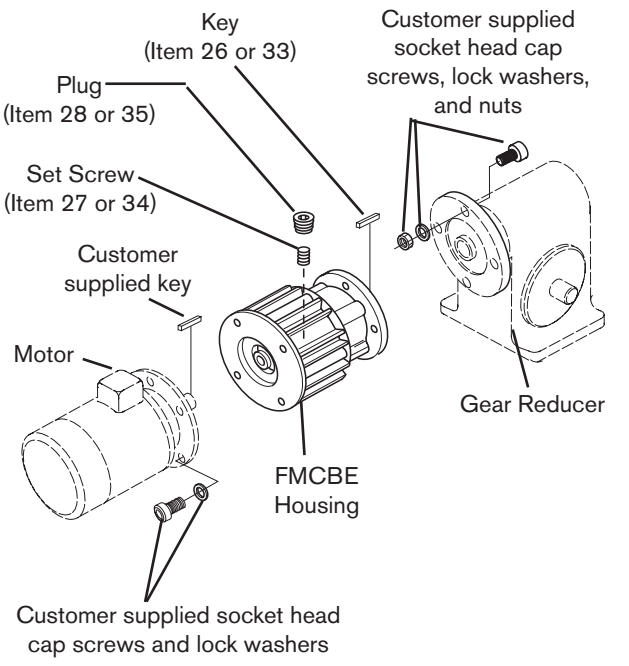


Figure 2

LUBRICATION

NOTE

Nexen pneumatically actuated devices require clean, pressure regulated air for maximum performance and life. All seals in Nexen Pneumatically operated devices are lubricated for life and do not require additional lubrication.

However, some customers prefer to use an air line lubricator, which injects oil into the pressurized air, forcing an oil mist into the air chamber. This is acceptable, but care must be taken to ensure once an air mist lubrication system is used, it is continually used over the life of the product as the oil mist may wash free the factory installed lubrication.

Locate the lubricator above and within ten feet of the product, and use low viscosity oil such as SAE-10.

Synthetic lubricants are not recommended.

Nexen product's bearings are shielded and pre-lubricated, and require no further lubrication.

LUBRICATOR DRIP RATE SETTINGS

⚠ CAUTION

These settings are for Nexen supplied lubricators. If you are not using a Nexen lubricator, calibration must follow the manufacturer's suggested procedure.

1. Close and disconnect the air line from the unit.
2. Turn the Lubricator Adjustment Knob counterclockwise 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 counterclockwise one-third turn.
8. Open the air line to the unit.

AIR CONNECTIONS

All Nexen pneumatically actuated devices require clean and dry air, which meet or exceeds ISO 8573.1:2001 Class 4.4.3 quality.

NOTE

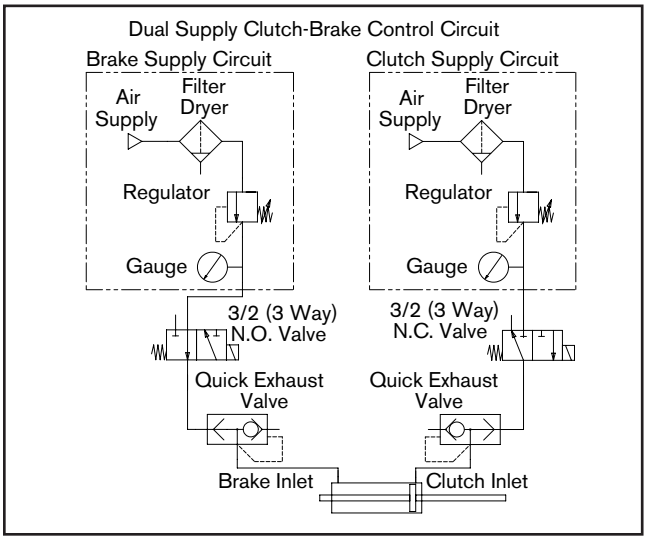
For quick response, Nexen recommends a quick exhaust valve and short air lines between the Control Valves and the product. Align the air inlet ports to a down position to allow condensation to drain out of the air chambers of the product.

The following are common air supply schemes used with this product. These are examples and not an all-inclusive list. All air circuits to be used with this product must be designed following ISO 4414 guidelines.

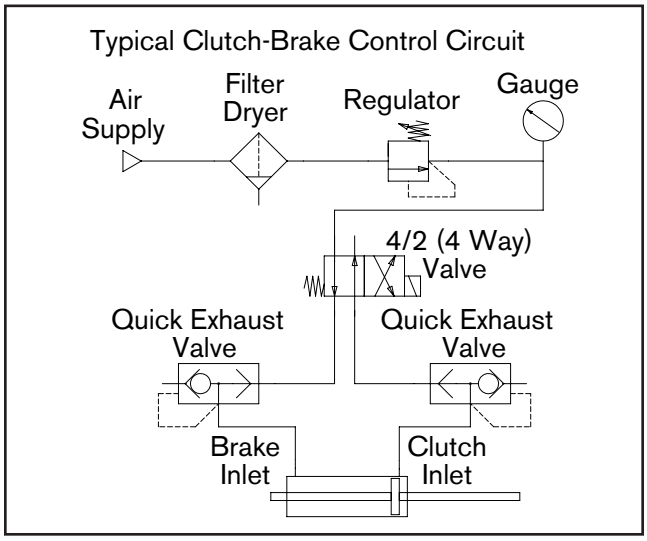
⚠ CAUTION

Low air pressure will cause slippage and overheating. Excessive air pressure will cause abrupt starts and stops, reducing product life.

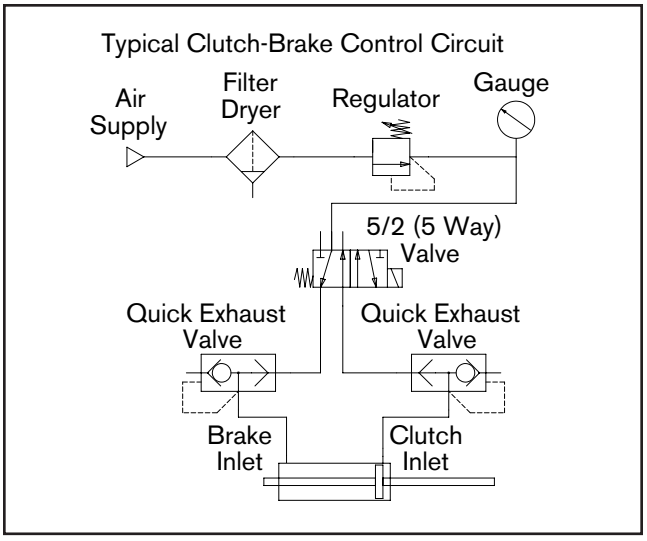
Air Pressure (Gage) Limits
6.9 Bar (100 PSI) Absolute Max.
0 Bar (0 PSI) Absolute Min.



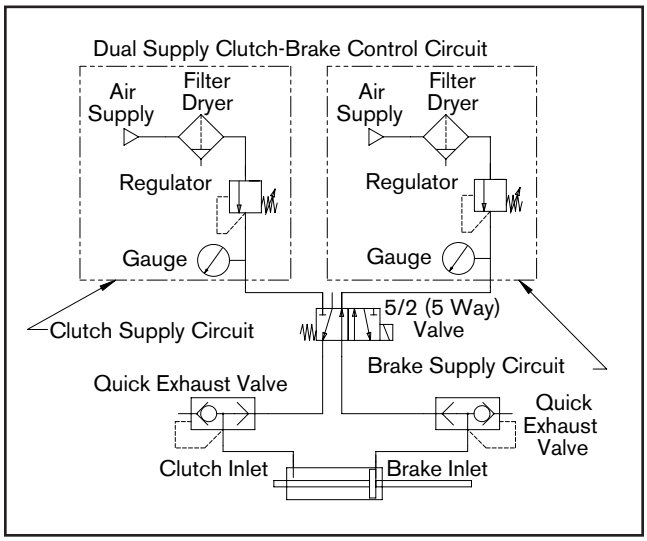
3/2 (3 Way)



4/2 (4 Way)



5/2 (4 Way)



5/2 (5 Way)

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.
	Lack of lubrication on Stub Shaft Spline.	Lubricate Stub Shaft spline.
	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.
	Lack of lubrication on Stub Shaft Spline.	Lubricate Stub Shaft spline.
Loss of torque.	Air leaks around the O-ring Seals.	Replace the O-ring Seals.
	Worn or dirty Friction Facings.	Replace the Friction Facings.

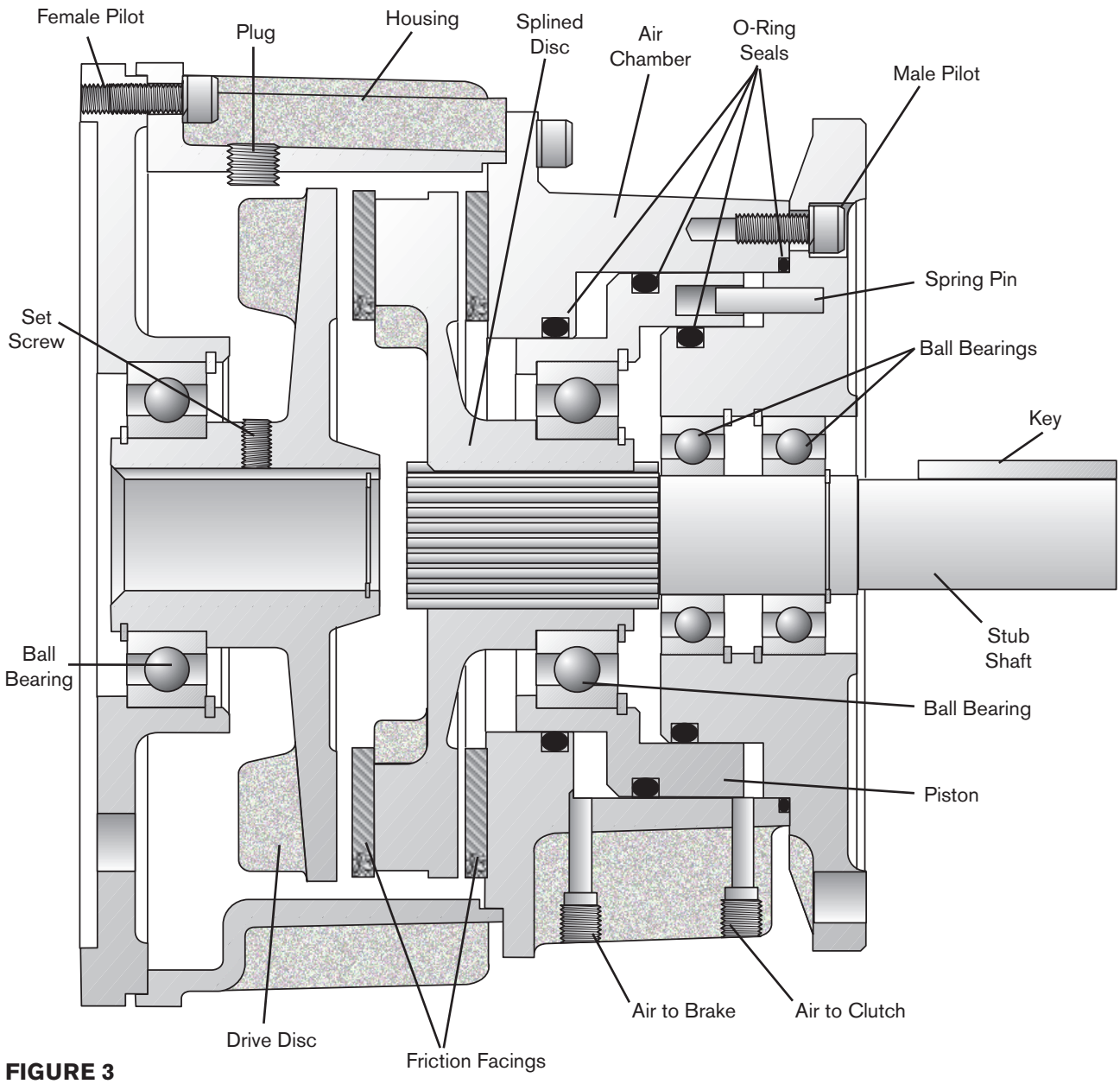


FIGURE 3

PARTS REPLACEMENT - FRICTION FACINGS

FMCBE 110-14, 130-19, 130-24, 7-28, 7-38, 8-38, AND 8-42

NOTE

If an Input Unit is installed on the FMCBE, it must be removed before servicing the FMCBE. Remove the Plug (Item 28) on Models 10-14, 130-19, and 130-24, or Item 35 on Models 7-28, 7-38, 8-38, and 8-42) and loosen the Set Screw (Item 27 on Models 110-14, 130-19, and 130-24, or Item 34 on Models 7-28, 7-38, 8-38 and 8-42) to release the FMCBE from the input unit shaft.

Refer to Figures 4 & 5.

1. Remove the four Socket Head Cap Screws (Item 14 on Models 110-14, 130-19, and 130-24, or Item 8 on Models 7-28, 7-38, and 8-42) and separate the two halves of the FMCBE.
2. Remove the six old Flat Head Screws (Item 12) and the first old split Friction Facing (Item 11).
3. Align the holes in the Splined Disc (Item 9) with the Flat Head Screws (Item 12) that secure the second split Friction Facing (Item 11).
4. Remove the six old Flat Head Screws (Item 12) and the second old Friction Facing (Item 11).
5. Install the first new split Friction Facing (Item 11) and the new Flat Head Screws (Item 12).
6. Tighten the six New Flat Head Screws (Item 12) to the recommended torque (See Table 1).
7. Install the second new split Friction Facing (Item 11) and new Flat Head Screws (Item 12).
8. Tighten the six new Flat head Screws (Item 12) to the recommended torque (See Table 1).
9. Apply a drop of Loctite® 242 to the threads of the Socket Head Cap Screws (Item 14 on Models 110-14, 130-19, and 130-24, or Item 8 on Models 7-28, 7-38, 8-38 and 8-42).
10. Install and tighten the four Socket Head Cap Screws to the recommended torque (See Table 1).

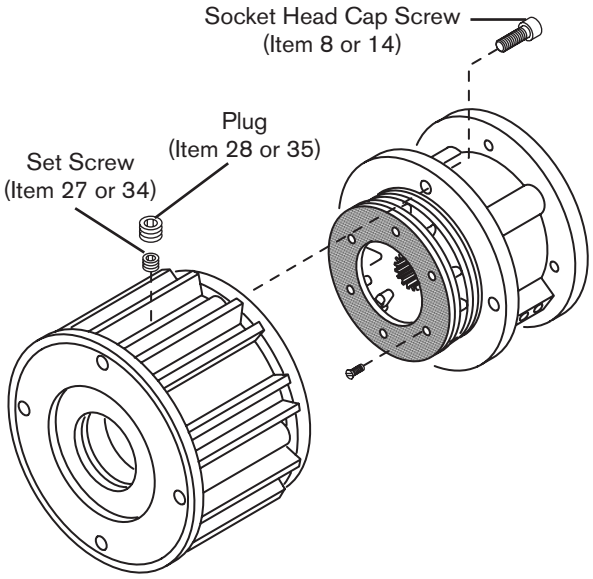


Figure 4

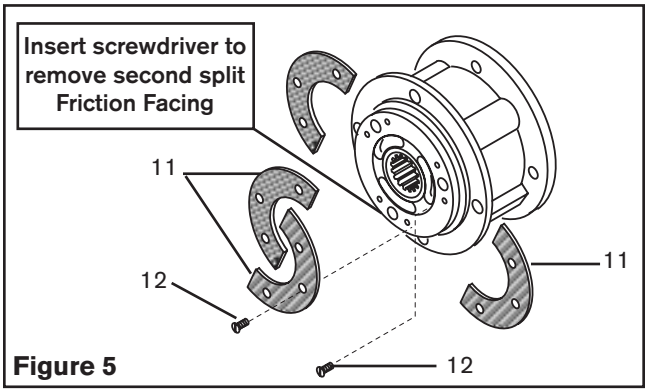


Figure 5

Table 1

RECOMMENDED TIGHTENING TORQUES		
FMCBE MODEL	ITEM NO.	TIGHTENING TORQUE
110-14	12	2.5 Nm [22 in-lb]
110-14	14	15.5 Nm [137 in-lb]
130-19	12	2.5 Nm [22 in-lb]
130-19	14	34.0 Nm [301 in-lb]
130-24	12	2.5 Nm [22 in-lb]
130-24	14	15.5 Nm [137 in-lb]
7-28	8	34.0 Nm [301 in-lb]
7-28	12	9.2 Nm [81 in-lb]
7-38	8	34.0 Nm [301 in-lb]
7-38	12	9.2 Nm [81 in-lb]
8-38	8	74.8 Nm [662 in-lb]
8-38	12	9.2 Nm [81 in-lb]
8-42	8	74.8 Nm [662 in-lb]
8-42	12	9.2 Nm [81 in-lb]

PARTS REPLACEMENT - HOUSING BEARING

NOTE

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

Refer to Figure 6.

FMCBE 110-14

1. Remove the four Socket Head Cap Screws (Item 14) and slide the Housing (Item 7), Bearing (Item 2), and the Drive Disc (Item 4) out of the FMCBE.

⚠ CAUTION

Working with spring loaded or tension loaded fasteners and devices can cause injury. Wear safety glasses and take the appropriate safety precautions.

2. Remove the Retaining Ring (Item 6).
3. Press the Drive Disc (Item 4) out of the Bearing (Item 2) and the Housing (Item 7).
4. Remove the Retaining Ring (Item 3).
5. Fully supporting the Housing (Item 7), press the old Bearing (Item 2) out of the Housing.

NOTE

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

6. Clean the bearing bore of the Housing (Item 7) with fresh safety solvent, making sure all old Loctite® residue is removed.
7. Apply an adequate amount of Loctite® 680 to evenly coat the outer race of the new Bearing (Item 2).
8. Carefully align the outer race of the new Bearing (Item 2) with the bore of the Housing (Item 7).
9. Supporting the Housing (Item 7) and pressing on the outer race of the new Bearing (Item 2), press the new Bearing into the Housing.

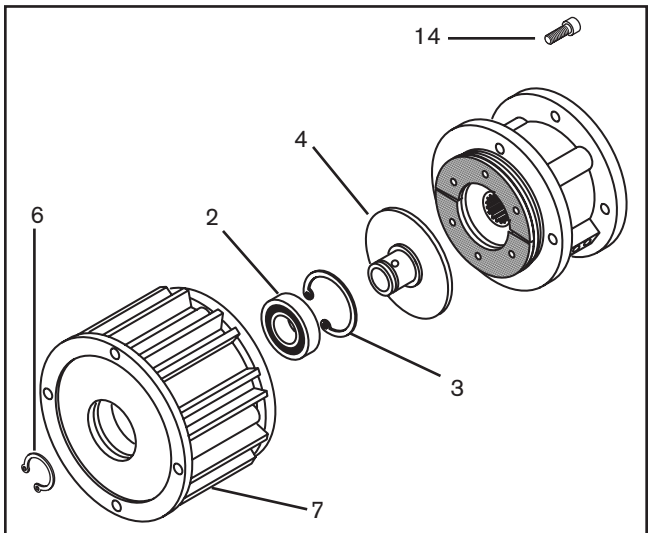


Figure 6

10. Reinstall the Retaining Ring (Item 3).
11. Support the inner race of the new Bearing (Item 2) and press the Drive Disc (Item 4) into the new Bearing and Housing (Item 7).
12. Reinstall the Retaining Ring (Item 6).
13. Apply a drop of Loctite® 242 to the threads of the Socket Head Cap Screws (Item 14).
14. Slide the Housing (Item 7), Bearing (Item 2), and Drive Disc (Item 4) into the FMCBE and reinstall the four Socket Head Cap Screws (Item 14).
15. Tighten the four Socket Head Cap Screws (Item 14) to 14.2 Nm [10.5 ft-lb] torque.

PARTS REPLACEMENT - FEMALE PILOT BEARING

FMCBE 130-19, 130-24, 7-28, 7-38, 8-38, AND 8-42

Refer to Figure 7.

1. Remove the four Socket Head Cap Screws (Item 8) and slide the Female (Item 1), Bearing (Item 2), and the Drive Disc (Item 4) out of the FMCBE.

⚠ CAUTION

Working with spring loaded or tension loaded fasteners and devices can cause injury. Wear safety glasses and take the appropriate safety precautions.

2. Remove the Retaining Ring (Item 6).
3. Press the Drive Disc (Item 4) out of the Bearing (Item 2) and the Female Pilot (Item 1).
4. Remove the Retaining Ring (Item 3).
5. Fully supporting the Female Pilot (Item 1), press the old Bearing (Item 2) out of the Female Pilot (Item 1).

NOTE

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

6. Clean the bearing bore of the Female Pilot (Item 1) with fresh safety solvent, making sure all Loctite® residue is removed.
7. Apply an adequate amount of Loctite® 680 to evenly coat the outer race of new Bearing (Item 2).
8. Carefully align the outer race of the new Bearing (Item 2) with the bore of the Female Pilot (Item 1).
9. Supporting the Female Pilot (Item 1) and pressing on the outer race of the new Bearing (Item 2), press the new Bearing into the Female Pilot.
10. Reinstall the Retaining Ring (Item 3).
11. Support the inner race of the new Bearing (Item 2) and press the Drive Disc (Item 4) into the new Bearing and Female Pilot (Item 1).
12. Reinstall the Retaining Ring (Item 6).
13. Apply a drop of Loctite® 242 to the threads of the Socket Head Cap Screws (Item 8).
14. Slide the Female Pilot (Item 1), Bearing (Item 2), and Drive Disc (Item 4) into the FMCBE and reinstall the four Socket Head Cap Screws (Item 8).
15. Tighten the four Socket Head Cap Screws (Item 8) to the recommended torque.

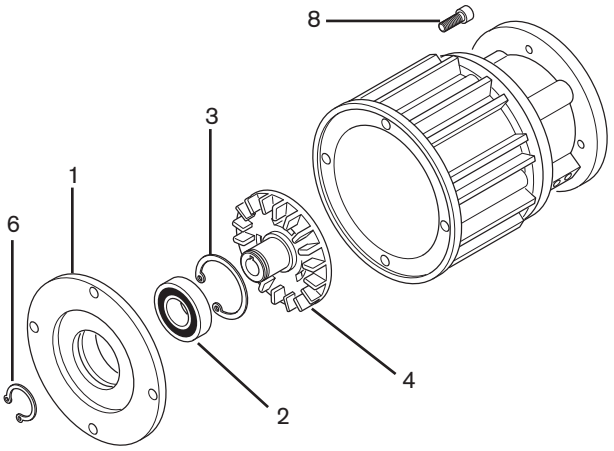


Figure 7

Table 2

FMCBE MODEL	RECOMMENDED TIGHTENING TORQUES SOCKET HEAD CAP SCREWS (ITEM 14)
130-19	14.2 Nm [10.5 ft-lb]
130-24	14.2 Nm [10.5 ft-lb]
7.28	14.2 Nm [24.5 ft-lb]
7-28	14.2 Nm [24.5 ft-lb]
8-38	67.1 Nm [49.5 ft-lb]
8-42	67.1 Nm [49.5 ft-lb]

PARTS REPLACEMENT - PISTON BEARING AND O-RING SEALS

NOTE

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

FMCBE 110-14, 130-19 AND 130-24

Refer to Figure 8.

1. Remove the four Socket Head Cap Screws (Item 14) and separate the Air Chamber (Item 13) from the Housing (Item 7).
2. Remove the four Socket Head Cap Screws (Item 14) securing the Male Pilot (Item 21) to the Air Chamber (Item 13).
3. Remove the Male Pilot (Item 21) and Stub Shaft (Item 24) from the Air Chamber (Item 13).

⚠ CAUTION

Working with spring loaded or tension loaded fasteners and devices can cause injury. Wear safety glasses and take the appropriate safety precautions.

Refer to Figure 9.

4. Remove the Retaining Ring (Item 6) from the Splined Disc (Item 9).
5. Press the Splined Disc (Item 9) from the Bearing (Item 2).
6. Remove the Piston (Item 16) from the Air Chamber (Item 13).
7. Remove the Retaining Ring (Item 3) from the Piston.
8. Remove the O-Ring Seals (Items 15 and 17) from the Piston (Item 16) and Air Chamber (Item 2).
9. Press the Bearing (Item 2) out of the Piston (Item 16).
10. Clean the bearing bore of the Piston with fresh safety solvent, making sure all old Loctite® residue is removed.
11. Apply an adequate amount of Loctite® 680 to evenly coat the outer race of the new Bearing (Item 13).
12. Carefully align the outer race of the new Bearing (Item 2) with the bore of the Piston (Item 16).
13. Supporting the Piston (Item 16) and pressing on the outer race of the new Bearing (Item 2), press the new Bearing into the Piston.
14. Reinstall the Retaining Ring (Item 3), securing the Bearing to the Piston.
15. Coat the O-Ring contact surfaces of the Air Chamber, Piston, and the O-Ring seals with a thin film of O-Ring lubricant and install the new O-Ring Seals (Items 15 and 17).

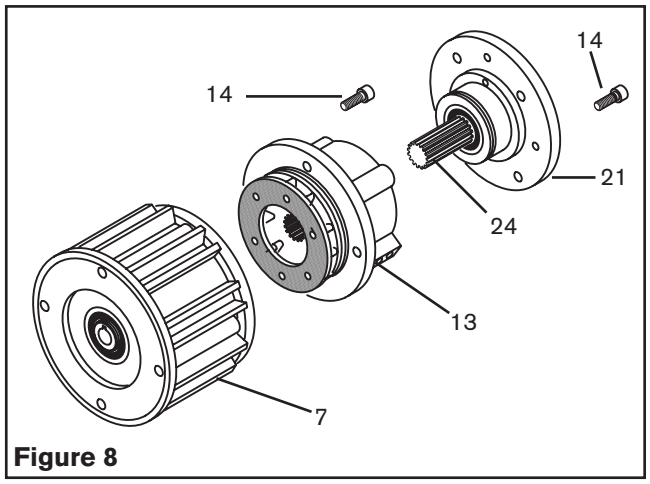


Figure 8

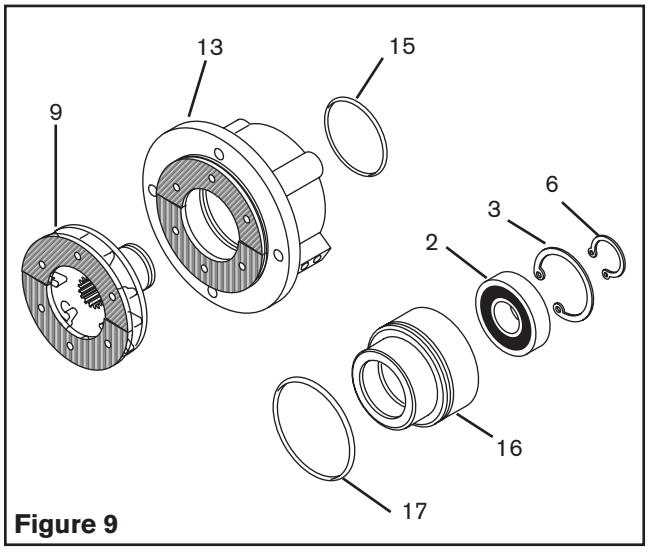


Figure 9

16. Slide the Piston (Item 16) into the Air Chamber (Item 13).
17. Support the inner race of the Bearing (Item 2) and press the Splined Disc (Item 9) into the Bearing and Piston.
18. Reinstall the Retaining Ring (Item 6) that secures the Splined Disc to the Bearing.
19. Apply a drop of Loctite® 242 to the threads of the Socket Head Cap Screws (Item 14).
20. Re-install and tighten the four Socket Head Cap Screws (Item 14), securing the Air chamber to the Housing using the recommended tightening torques (Table 1).

PARTS REPLACEMENT - MALE PILOT BEARINGS AND O-RING SEALS

FMCBE 110-14, 130-19, AND 130-24

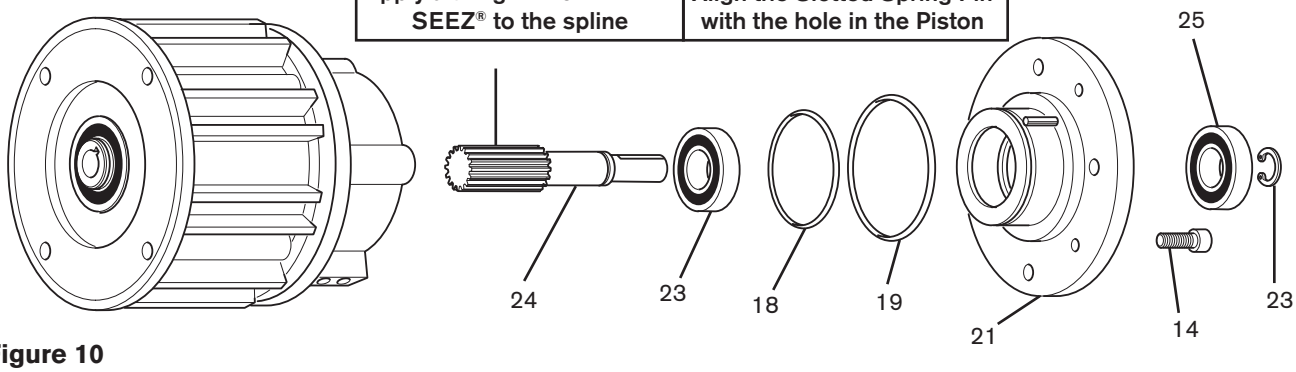


Figure 10

Refer to Figure 10.

1. Remove the O-Ring Seals (Items 18 and 19) from the Male Pilot (Item 21).

⚠ CAUTION

Working with spring loaded or tension loaded fasteners and devices can cause injury. Wear safety glasses and take the appropriate safety precautions.

2. Remove the Retaining Ring (Item 25) from the Stub Shaft (Item 24).
3. Press the Stub Shaft (Item 24) out of the Male Pilot (Item 21).

NOTE

One Bearing (Item 23) will remain attached to the Stub Shaft (Item 24).

4. Press the old Bearing (Item 23) off of the Stub Shaft (Item 24).
5. Press the old Bearing (Item 23) out of the Male Pilot (Item 21).

NOTE

It is not necessary to remove the Retaining Ring(s) (Item 22) from the inside of the Male Pilot (Item 21).

6. Clean the bearing bore of the Male Pilot (Item 21) with fresh safety solvent, making sure all old Loctite® residue is removed.
7. Apply an adequate amount of Loctite® 680 to evenly coat the outer race of a new Bearing (Item 23) and press it into the output side of the Male Pilot (Item 21) until it is seated against the Retaining Ring inside the Male Pilot.
8. Press a new Bearing (Item 23) onto the Stub Shaft (Item 24).
9. Apply an adequate amount of Loctite® 680 to evenly coat the outer race of new the Bearing (Item 23).
10. Carefully align the outer race of the new Bearing (Item 23) with the bore of the Male Pilot (Item 21).
11. Supporting the Male Pilot (Item 21) and pressing on the outer race of a new Bearing (Item 23), press the new Bearing and Stub Shaft into the Male Pilot.
12. Reinstall the Retaining Ring (Item 25).
13. Coat the O-Ring contact surfaces of the Male Pilot, Piston, and the O-Ring Seals with a thin film of O-Ring lubricant.
14. Install the new O-Ring Seals (Items 18 &19).
15. Apply a thin film of NEVER-SEEZ® to the splines of the Stub Shaft (Item 24).
16. Align the Slotted Spring Pin (Item 20) in the Male Pilot with the hole in the Piston.
17. Slide the Male Pilot and Stub Shaft into the FMCBE.
18. Apply a drop of Loctite® 242 to the threads of the Socket Head Cap Screws (Item 14).
19. Reinstall the four Socket Head Cap Screws (Item 14), securing the Male Pilot (Item 21) to the Air Chamber (Item 13).
20. Tighten the four Socket Head Cap Screws (Item 14) to 14.2 Nm [10.5 ft-lb] for FMCBE 110-14 and 33.2 Nm [24.5 ft-lb] for FMCBE 130-19 and 130-24.

FMCBE 7-28, 8-38, AND 8-42

Refer to Figure 11.

1. Remove the four Socket Head Cap Screws (Item 8) and separate the Air Chamber (Item 14) from the Housing (Item 7).
2. Remove the four Socket Head Cap Screws (Item 8) securing the Male Pilot (Item 27) to the Cylinder (Item 22).
3. Remove the Male Pilot (Item 27) and Stub Shaft (Item 31) from the Cylinder.
4. Remove the four Socket head Cap Screws (Item 15) securing the Cylinder (Item 22) to the Air Chamber (Item 14).
5. Remove the Cylinder from the Air Chamber.

⚠ CAUTION

Working with spring loaded or tension loaded fasteners and devices can cause injury. Wear safety glasses and take the appropriate safety precautions.

Refer to Figure 12.

6. Remove the Retaining Ring (Item 6) from the Splined Disc (Item 9).
7. Press the Splined Disc (Item 9) out of the Bearing (Item 2).
8. Remove the Piston (Item 17) from the Air Chamber (Item 14).
9. Remove the Retaining Ring (Item 3) from the Piston.
10. Remove the old O-Ring Seals from the Piston and Air Chamber.
11. Press the Bearing (Item 2) out of the Piston.
12. Clean the bearing bore of the Piston with fresh safety solvent, making sure all old Loctite® residue is removed.
13. Apply an adequate amount of Loctite® 680 to evenly coat the outer race of the new Bearing (Item 2).
14. Carefully align the outer race of the new Bearing (Item 2) with the bore of the Piston.
15. Supporting the Piston (Item 17) and pressing on the outer race of the new Bearing (Item 2), press the new Bearing into the Piston.
16. Reinstall the Retaining Ring (Item 3), securing the Bearing to the Piston.
17. Coat the O-Ring contact surfaces of the Air Chamber, Piston, and the O-Ring Seals with a thin film of O-Ring lubricant and install the new O-Ring Seals.
18. Slide the Piston into the Air Chamber (Item 14).
19. Support the inner race of the Bearing (Item 2) and press the Splined Disc (Item 9) into the Bearing and Piston.

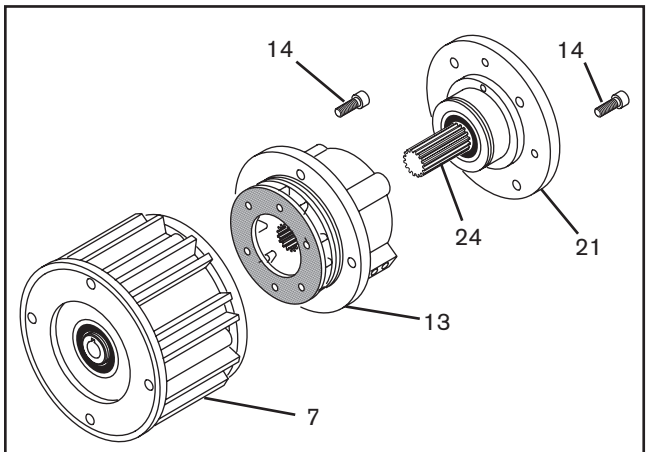


Figure 11

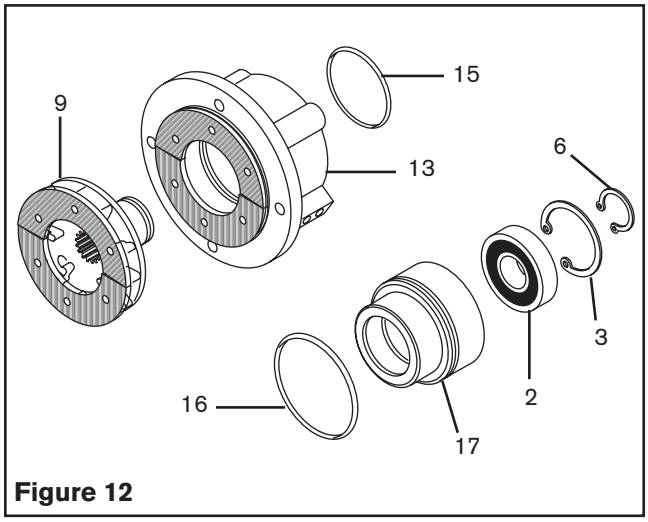


Figure 12

Table 3

FMCBE MODEL	RECOMMENDED TIGHTENING TORQUES SOCKET HEAD CAP SCREWS (ITEM 14)
7-28	23.3 Nm [17.2 ft-lb]
8-38	46.2 Nm [34.1 ft-lb]
8-42	46.2 Nm [34.1 ft-lb]

20. Reinstall the Retaining Ring (Item 6) that secures the Splined Disc to the Bearing.
21. Apply a drop of Loctite® 242 to the threads of the Socket Head Cap Screws (Item 8).
22. Reinstall and tighten the four Socket Head Cap Screws (Item 8), securing the Air Chamber (Item 14) to the Housing (Item 7) to the recommended torque (See Table 3).

PARTS REPLACEMENT - MALE PILOT BEARINGS AND O-RING SEALS

FMCBE 7-28, 8-38, AND 8-42

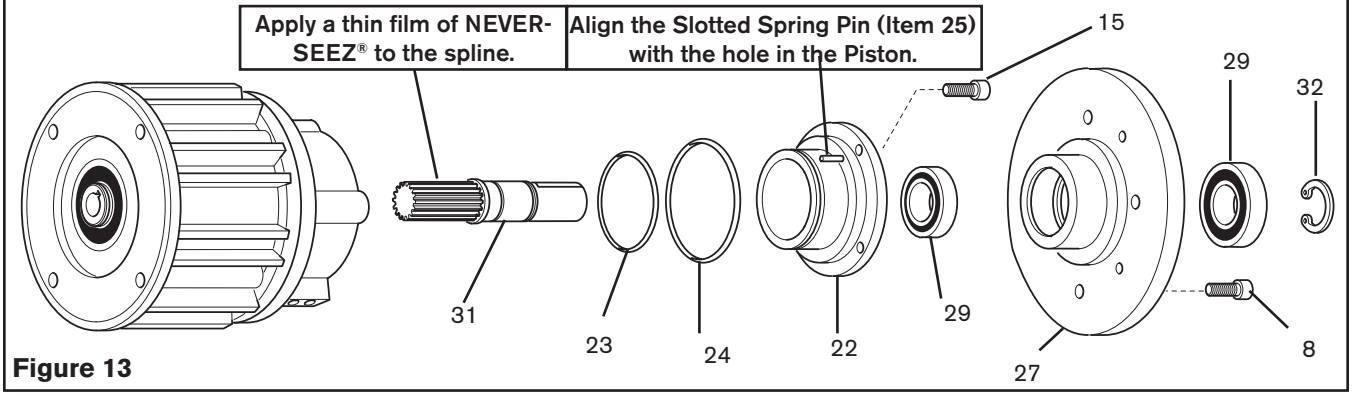


Figure 13

Refer to Figure 13.

1. Remove the old O-Ring Seals (Items 23 and 24) from the Cylinder (Item 22).

⚠ CAUTION

Working with spring loaded or tension loaded fasteners and devices can cause injury. Wear safety glasses and take the appropriate safety precautions.

2. Remove the Retaining Ring (Item 32) from the Stub Shaft (Item 31).
3. Press the Stub Shaft (Item 31) out of the Male Pilot (Item 27).

NOTE

One Bearing (Item 29) will come out of the Male Pilot (Item 27) attached to the Stub Shaft (Item 31).

4. Press the old Bearing (Item 29) off of the Stub Shaft (Item 31).
5. Press the old Bearing (Item 29) out of the Male Pilot (Item 27).

NOTE

It is not necessary to remove the Retaining Ring (Item 28) from the inside of the Male Pilot (Item 27).

6. Clean the bearing bore of the Male Pilot (Item 27) with fresh safety solvent, making sure all old Loctite® residue is removed.
7. Press the first new Bearing (Item 29) onto the Stub Shaft (Item 31).
8. Apply an adequate amount of Loctite® 680 to evenly coat the outer race of the new Bearing (Item 27).
9. Carefully align the outer race of the new Bearing (Item 29) with the bore of the Male Pilot (Item 27).
10. Supporting the Male Pilot (Item 27) and pressing on the outer race of the new Bearing (Item 29), press a new Bearing and Stub Shaft into the Male Pilot.
11. While supporting both the Stub Shaft and Male Pilot and pressing on both the inner and outer races of the new Bearing, press a new Bearing into the Male Pilot and onto the Stub Shaft.
12. Reinstall the Retaining Ring (Item 32).
13. Coat the O-Ring contact surfaces of the Cylinder (Item 22), new O-Ring Seals (Items 23 and 24), and the Piston located inside the Air Chamber with a thin film of O-Ring lubricant and install the new O-Ring Seals (Items 23 and 24).
14. Align the Slotted Spring Pin (Item 25) in the Cylinder (Item 22) with the hole in the Piston.
15. Slide the Cylinder onto the FMCBE.
16. Apply a drop of Loctite® 242 to the threads of the Socket Head Cap Screws (Item 15).
17. Reinstall the four Socket Head Cap Screws (Item 15) securing the Cylinder to the FMCBE.
18. Tighten the four Socket Head Cap Screws (Item 15) to the recommended torque.
19. Apply a thin film of NEVER-SEEZ® to evenly coat the splines of the Stub Shaft (Item 31).
20. Slide the Male Pilot and Stub Shaft into the FMCBE.
21. Apply a drop of Loctite® 242 to the threads of the Socket Head Cap Screws (Item 8).
22. Reinstall the four Socket Head Cap Screws (Item 8) securing the Male Pilot to the FMCBE.
23. Tighten the four Socket Head Cap Screws (Item 8) to the recommended torque (See Table 4).

Table 4

FMCBE MODEL	TIGHTENING TORQUES	
	ITEM 8	ITEM 15
7-28	33.2 Nm [24.5 ft-lb]	16.7 Nm [12.3 ft-lb]
8-38	67.1 Nm [49.5 ft-lb]	33.2 Nm [24.5 ft-lb]
8-42	67.1 Nm [49.5 ft-lb]	33.2 Nm [24.5 ft-lb]

FMCBE 7-38

Refer to Figure 14.

1. Remove the four Socket Head Cap Screws (Item 8) and separate the Air Chamber (Item 14) from the Housing (Item 7).
2. Remove the four Socket Head Cap Screws (Item 8) securing the Male Pilot (Item 27) to the Cylinder (Item 22).
3. Remove the Male Pilot and Stub Shaft (Item 31) from the Cylinder.
4. Remove the four Socket Head Cap Screws (Item 15) securing the Cylinder (Item 22) to the Air Chamber (Item 14).
5. Remove the Cylinder from the Air Chamber.

⚠ CAUTION

Working with spring loaded or tension loaded fasteners and devices can cause injury. Wear safety glasses and take the appropriate safety precautions.

Refer to Figure 15.

6. Remove the Retaining Ring (Item 20) from the Splined Disc (Item 9).
7. Press the Splined Disc (Item 9) out of the Bearing (Item 18).
8. Remove the Piston (Item 17) from the Air Chamber (Item 14).
9. Remove the Retaining Ring (Item 19) from the Piston (Item 17).
10. Remove the old O-Ring Seals from the Piston and Air Chamber.
11. Press the old Bearing (Item 18) out of the Piston (Item 17).
12. Clean the bearing bore of the piston with fresh safety solvent, making sure all old Loctite® residue is removed.
13. Apply an adequate amount of Loctite® 680 to evenly coat the outer race of the new Bearing (Item 18).
14. Carefully align the outer race of the new Bearing (Item 18) with the bore of the Piston (Item 17).
15. Supporting the Piston (Item 17) and pressing on the outer race of the new Bearing (Item 18), press the new Bearing into the Piston.
16. Reinstall the Retaining Ring (Item 19), securing the Bearing to the Piston.

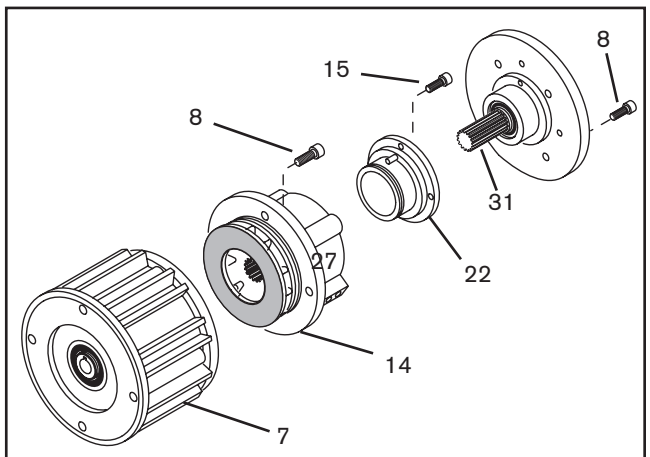


Figure 14

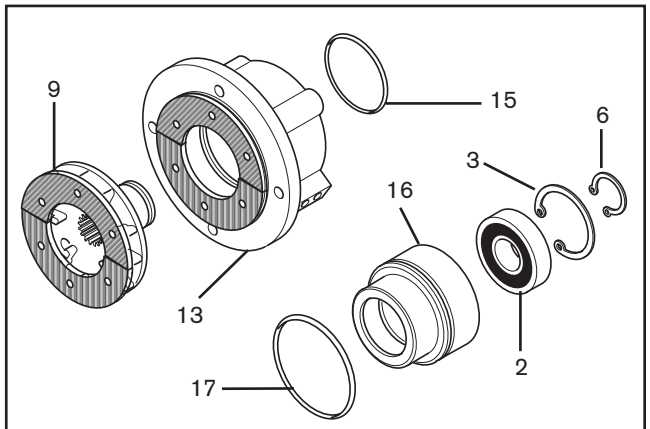


Figure 15

17. Coat the O-Ring contact surfaces of the Air Chamber, Piston, and the O-Ring Seals with a thin film of O-Ring lubricant and install the new O-Ring Seals.
18. Slide the Piston (Item 17) into the Air Chamber (Item 14).
19. Support the inner race of the Bearing (Item 18) and press the Splined Disc (Item 9) into the Bearing and Piston.
20. Reinstall the Retaining Ring (Item 20) that secures the Splined Disc to the Bearing.
21. Apply a drop of Loctite® 242 to the threads of the Socket Head Cap Screws (Item 8).
22. Reinstall and tighten the four Socket Head Cap Screws (Item 8) securing the Air Chamber (Item 8) to the Housing (Item 7) to 33.2 Nm [24.5 ft-lb].

PARTS REPLACEMENT - MALE PILOT BEARINGS AND O-RING SEALS

FMCBE 7-38

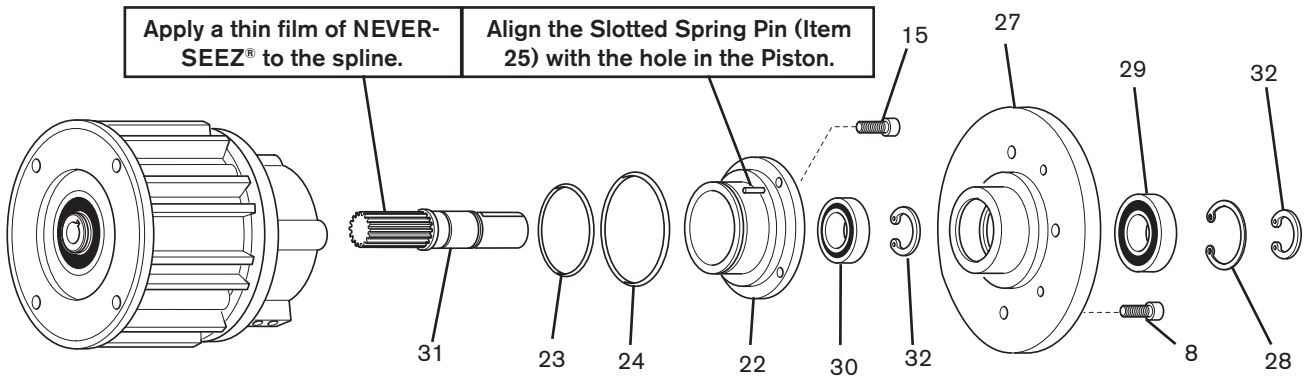


Figure 16

NOTE: Refer to Figure 16.

1. Remove the old O-Ring Seals (Items 23 and 24) from the Cylinder (Item 22).

⚠ CAUTION

Working with spring loaded or tension loaded fasteners and devices can cause injury. Wear safety glasses and take the appropriate safety precautions.

2. Remove the first Retaining Ring (Item 32) from the Stub Shaft (Item 31).
3. Press the Stub Shaft (Item 31) out of the Male Pilot (Item 27).

NOTE

Bearing (Item 30) will come out of the Male Pilot (Item 27) attached to the Stub Shaft (Item 31).

4. Remove the second Retaining Ring (Item 32) from the Stub Shaft (Item 31).
5. Remove the old Bearing (Item 30) from the Stub Shaft (Item 31).
6. Remove Retaining Ring (Item 28) from the Male Pilot (Item 27).
7. Press the second old Bearing (Item 29) out of the Male Pilot (Item 27).
8. Clean the bearing bore of the Male Pilot (Item 27) with fresh safety solvent, making sure all old Loctite® residue is removed.
9. Press the new Bearing (Item 30) onto the Stub Shaft (Item 31).
10. Reinstall the first Retaining Ring (Item 32) onto the Stub Shaft (Item 31).
11. Apply an adequate amount of Loctite® 680 to evenly coat the outer race of new Bearing (Item 29).
12. Carefully align the outer race of the new Bearing (Item 29) with the bore of the Male Pilot (Item 27).
13. Supporting the Male Pilot (Item 27) and pressing on the outer race of the new Bearing (Item 29), press the new Bearing into the Male Pilot.
14. Reinstall Retaining Ring (Item 28).
15. Apply an adequate amount of Loctite® 680 to evenly coat the outer race of the new Bearing (Item 30).
16. While supporting the inner race of Bearing (Item 29) and pressing on the outer race of the Bearing (Item 30), press the new Bearing and Stub Shaft into the Male Pilot and Bearing.
17. Reinstall the second Retaining Ring (Item 32).
18. Coat the O-Ring contact surfaces of the Cylinder (Item 22), new O-Ring Seals (Item 23 & 24), and the Piston (located inside the Air Chamber) with a thin film of O-Ring lubricant and install the new O-Ring Seals.
19. Align the Slotted Spring Pin (Item 25) in the Cylinder with the hole in the Piston.
20. Slide the Cylinder (Item 22) onto the FMCBE.
21. Apply a drop of Loctite® 242 to the threads of the Socket Head Cap Screws (Item 15).
22. Reinstall the four Socket Head Cap Screws (Item 15), securing the Cylinder (Item 22) to the FMCBE.
23. Tighten the four Socket Head Cap Screws (Item 15), to 16.7 Nm [12.3 ft-lb].
24. Apply a thin film of NEVER-SEEZ® to evenly coat the splines of the Stub Shaft (Item 31).
25. Slide the Male Pilot and Stub Shaft into the FMCBE.
26. Apply a drop of Loctite® 242 to the threads of the Socket Head Cap Screws (Item 8).
27. Reinstall the four Socket Head Cap Screws (Item 8) securing the Male Pilot to the FMCBE.
28. Tighten the four Socket Head Cap Screws (Item 8) to 33.2 Nm [24.5 in-lb] torque.

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

FMCBE 110-14

Refer to Figure 17.

NOTE

Remove the Plug (Item 28) and loosen the Set Screw (Item 27) one full turn to release the Input Unit Shaft from the FMCBE Both the Plug (Item 28) and the Set Screw (Item 27) are located on the FMCBE Housing.

1. Remove the Socket Head Cap Screws (Item 29) and Lock Washers (Item 30); then, remove the input Unit from the FMCBE.

⚠ CAUTION

Working with spring loaded or tension loaded fasteners and devices can cause injury. Wear safety glasses and take the appropriate safety precautions.

2. Remove the Retaining Ring (Item 34) from the output end of the Input Unit.
3. Fully supporting the Flange (Item 27), press the Shaft (Item 28) out of the Input Unit.

NOTE

Bearing (Item 19) will come out of the Flange (Item 27) with the Shaft (Item 28).

4. Remove the Retaining Ring (Item 35) from the Shaft (Item 28).
5. Press the old Bearing (Item 19) off the Shaft (Item 28).

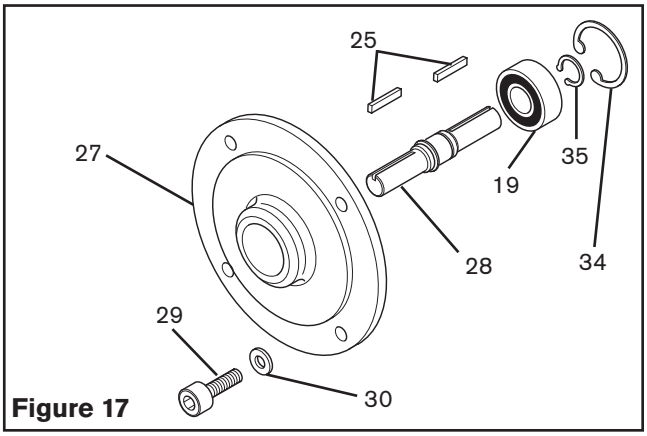


Figure 17

NOTE

Do not reuse the old Bearing (Item 19). Applying force to the inner bearing race to remove a bearing held by the outer race causes damage to the bearing.

6. Clean the bearing bore of the Flange (Item 27) with fresh safety solvent, making sure all old Loctite® residue is removed.
7. Apply an adequate amount of Loctite® 680 to evenly coat the outer race of the new Bearing (Item 19).
8. 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.
9. Reinstall the Retaining Ring (Item 34).
10. Fully supporting the inner race of the Bearing (Item 19), press the Shaft (Item 28) into the Bearing until the Retaining Ring (Item 35) on the Shaft is seated against the Bearing.
11. Reinstall the second Retaining Ring (Item 35).

FMCBE 130-19 AND 130-24

Refer to Figure 18.

NOTE

Remove the Plug (Item 28) and loosen Set Screw (Item 27) one full turn to release the Input Unit Shaft from the FMCBE. Both the Plug (Item 28) and Set Screw (Item 27) are located on the FMCBE Housing.

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.
3. Using a bearing puller, remove the Bearing (Item 19) from the Flange (Item 27).

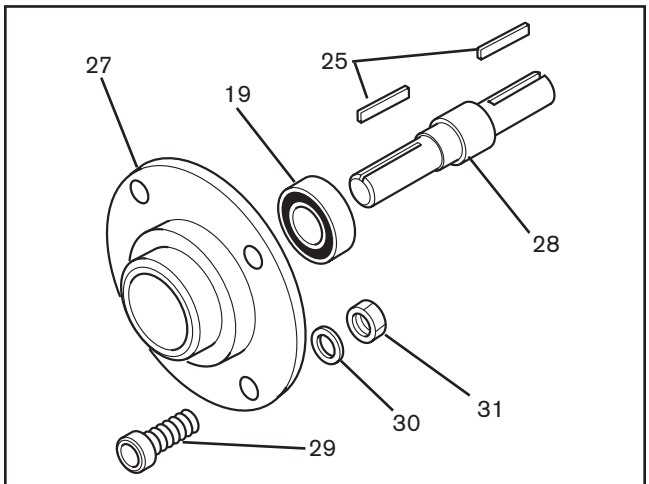


Figure 18

NOTE

Do not reuse the old bearing. Applying force to the inner bearing race to remove a bearing help 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).
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.
7. Press the Shaft (Item 28) into the Input Unit.

FMCBE 7-28, 7-38, 8-38 AND 8-42

Refer to Figure 19.

NOTE

Remove the Plug (Item 35) and loosen the Set Screw (Item 34) one full turn to release the Input Unit Shaft from the FMCBE. Both the Plug (Item 35) and Set Screw (Item 34) are located on the FMCBE Housing.

1. Remove the Socket Head Cap Screws (Item 37) and Lock Washers (Item 38); then, remove the Input Unit from the FMCBE.

⚠ CAUTION

Working with spring loaded or tension loaded fasteners and devices can cause injury. Wear safety glasses and take the appropriate safety precautions.

2. Remove the Retaining Ring (Item 28) from the output end of the Input Unit.
3. Fully supporting the Flange (Item 35), press the Shaft (Item 36) out of the Input Unit.

NOTE

Bearing (Item 29) will come out of the Flange (Item 36) with the Shaft (Item 36).

4. Remove the Retaining Ring (Item 32) from Shaft.
5. Press old Bearing (Item 29) off the Shaft (Item 36).

NOTE

Do note reuse the old Bearing (Item 29). Applying force to the inner bearing race to remove a bearing held by the outer race causes damage to the bearing.

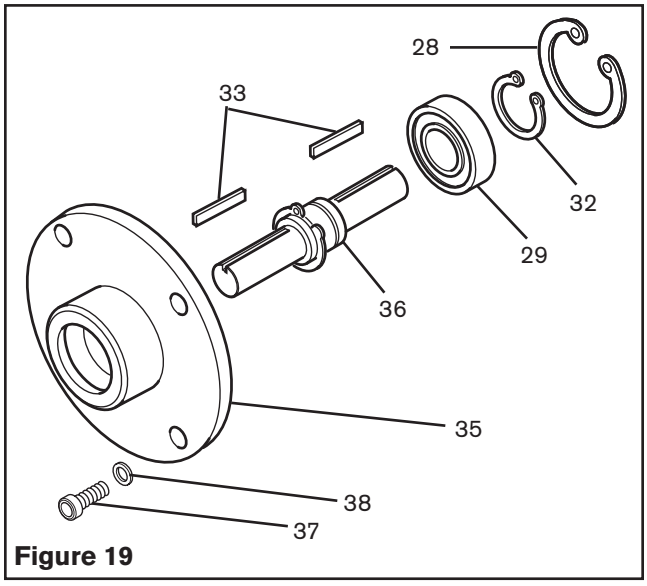


Figure 19

6. Clean the bearing bore of the Flange (Item 35) with fresh safety solvent, making sure all old Loctite® residue is removed.
7. Apply an adequate amount of Loctite® 680 to evenly coat the outer race of the new Bearing (Item 29).
8. Carefully align the outer race of the new Bearing (Item 29) with the bore of the Flange (Item 35) and press the new Bearing into place.
9. Reinstall the Retaining Ring (Item 28).
10. Fully supporting the inner race of the Bearing (Item 29), press the Shaft (Item 36) into the Bearing until the Retaining Ring (Item 32) is seated against the Bearing.
11. Reinstall the second Retaining Ring (Item 32).

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 110-14

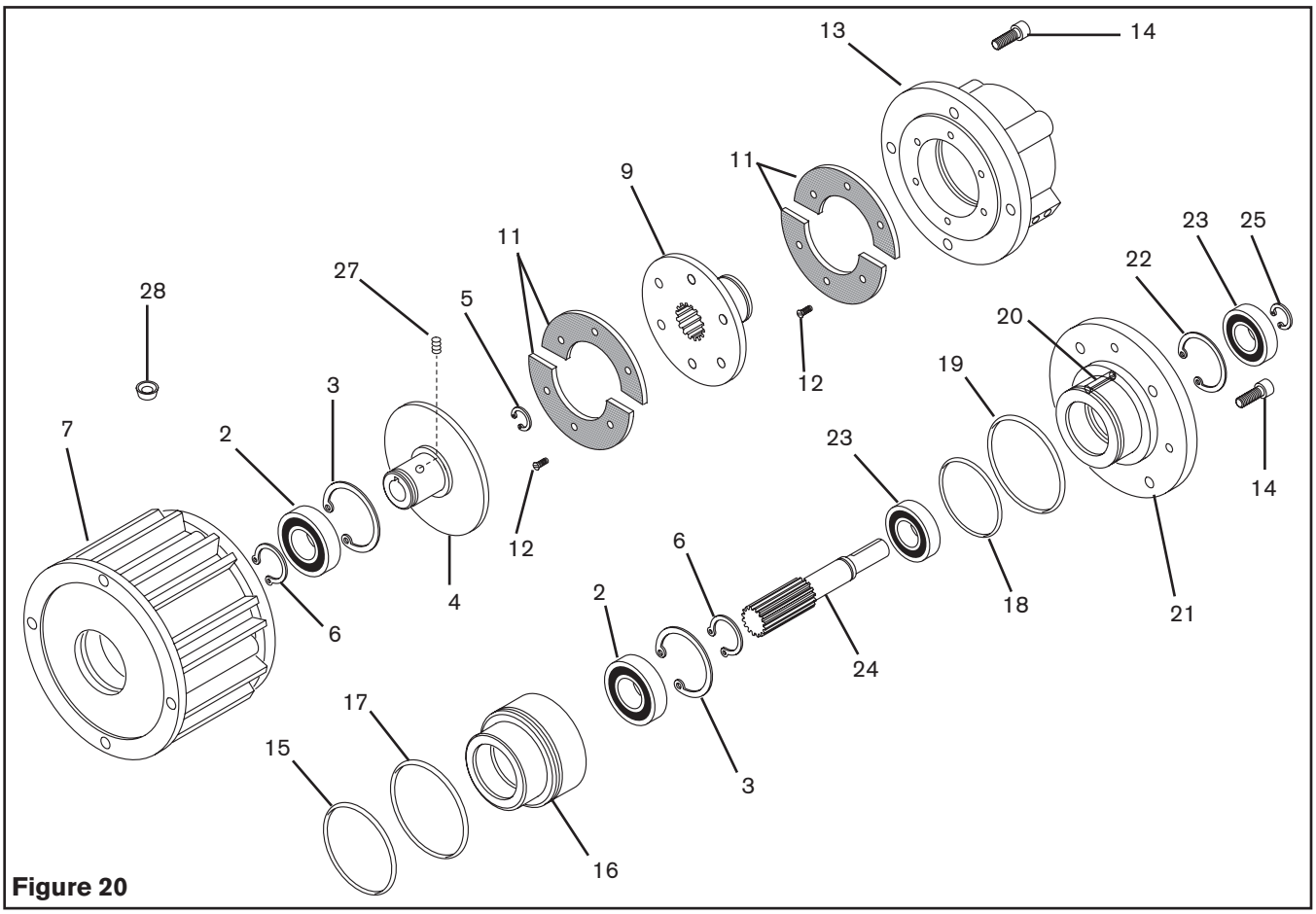


Figure 20

ITEM	DESCRIPTION	QTY
2[1]	Bearing	2
3	Retaining Ring (Int.)	2
4	Drive Disc	1
5	Retaining Ring (Int.)	1
6	Retaining Ring (Ext.)	2
7	Housing	1
9	Splined Disc	1
11[2]	Friction Facing	2
12[2]	Flat Head Screw (M5-0.8)	12
13	Air Chamber	1
14	Socket Head Cap Screw (M6-1.0)	8
15[1]	O-ring Seal	1
16	Piston	1

ITEM	DESCRIPTION	QTY
17[1]	O-ring Seal	1
18[1]	O-ring Seal	1
19[1]	O-ring Seal	1
20	Slotted Spring Pin	1
21	Male Pilot	1
22	Retaining Ring (Int.)	1
23[1]	Bearing	2
24	Stub Shaft	1
25	Retaining Ring (Ext.)	1
26	Key (Not Shown)	1
27	Set Screw	1
28	Plug (0.125 NPTF)	1

[1] Denotes Repair Kit items found in Repair Kit 801436.
[2] Denotes Facing Kit items found in Facing Kit 801448 (two kits required per unit).

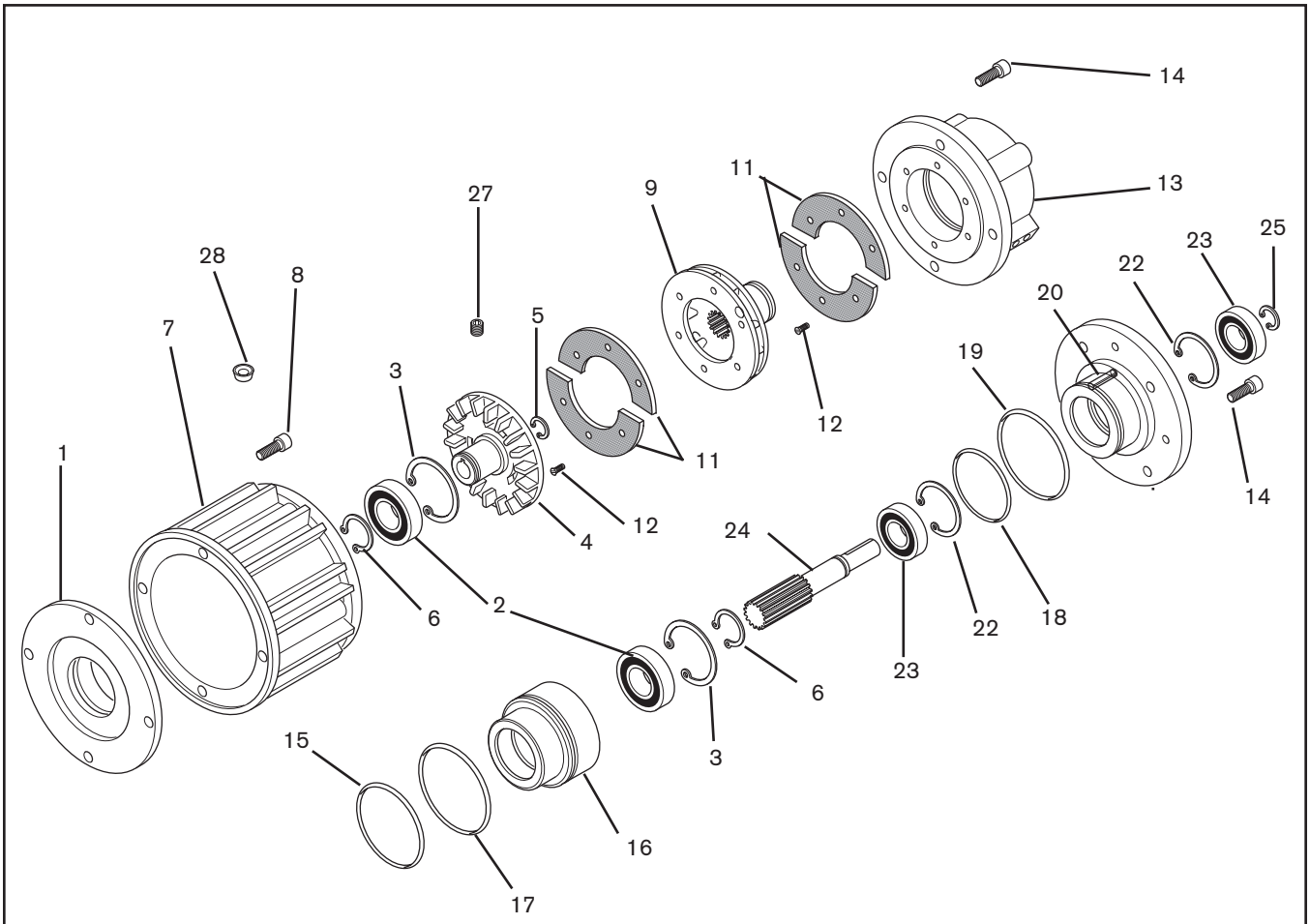


Figure 21

ITEM	DESCRIPTION	QTY
1	Female Pilot	1
2[1]	Bearing	2
3	Retaing Ring (Int.)	2
4	Drive Disc	1
5	Retaining Ring (Int.)	1
6	Retaining Ring (Ext.)	2
7	Housing	1
8	Socket Head Cap Screw (M6-1.0)	4
9	Splined Disc	1
11[2]	Friction Facing	2
12[2]	Flat Head Scrw (M5-0.8)	12
13	Air Chamber	1
14	Socket Head Cap Screws (M8-1.25)	8

ITEM	DESCRIPTION	QTY
15[1]	O-ring Seal	1
16	Piston	1
17[1]	O-ring Seal	1
18[1]	O-ring Seal	1
19[1]	O-ring Seal	1
20	Slotted Spring Pin	1
21	Male Pilot	1
22	Retaining Ring (Int.)	2
23[1]	Bearing	2
24	Stub Shaft	1
25	Retaining Ring (Ext.)	1
26	Key (Not Shown)	1
27	Set Screw	1
28	Plub (0.125 NPTF)	1

[1] Denotes Repair Kit items found in Repair Kit #801428.
[2] Denotes Repair Kit items found in Repair Kit #801430 (two kits required per unit).

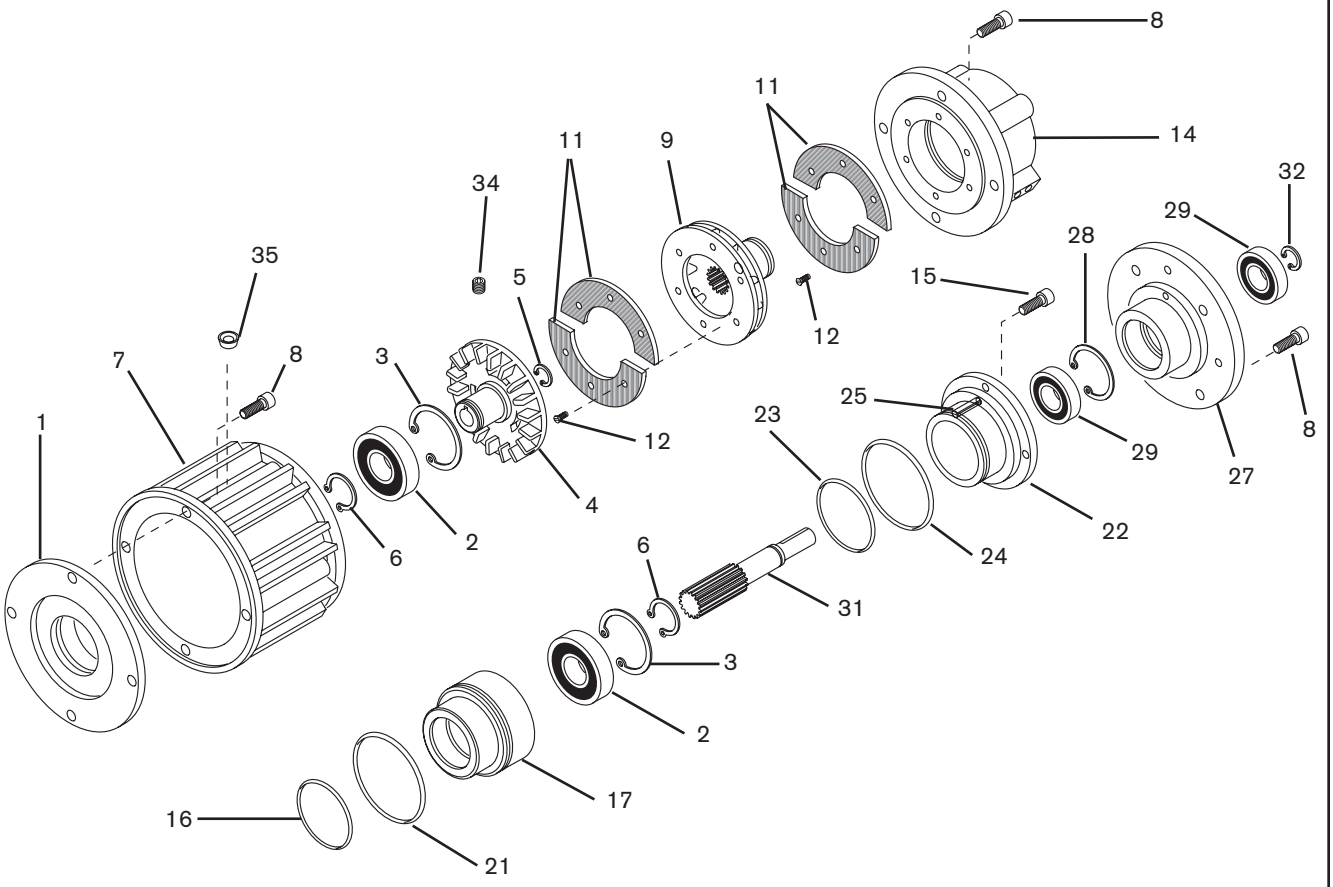


Figure 22

ITEM	DESCRIPTION	QTY
1	Female Pilot	1
2[1]	Bearing	2
3	Retaining Ring (Int.)	2
4	Drive Disc	1
5	Retaining Ring (Int.)	1
6	Retaining Ring (Ext.)	2
7	Housing	1
8	Socket Head Cap Scrw (M8-1.25)	12
9	Splined Disc	1
11[2]	Friction Facing	2
12[2]	Flat Head Screw (M6-1.0)	12
14	Air Chamber	1
15	Socket Head Cap Screw (M8-1.25)	4
16[1]	O-ring Seal	1

ITEM	DESCRIPTION	QTY
17	Piston	1
21[1]	O-ring Seal	1
22	Cylinder	1
23[1]	O-ring Seal	1
24[1]	O-ring Seal	1
25	Slotted Spring Pin	1
27	Male Pilot	1
28	Retaining Ring (Int.)	1
29[1]	Bearing	2
31	Stub Shaft	1
32	Retaining Ring (Ext.)	1
33	Key (Not Shown)	1
34	Set Screw (M8-1.25)	1
35	Plug (0.250 NPTF)	1

1 Denotes Repair Kit items found in Repair Kit #801637
2 Denotes Facing Kit items found in Facing Kit #801605 (two kits required per unit).

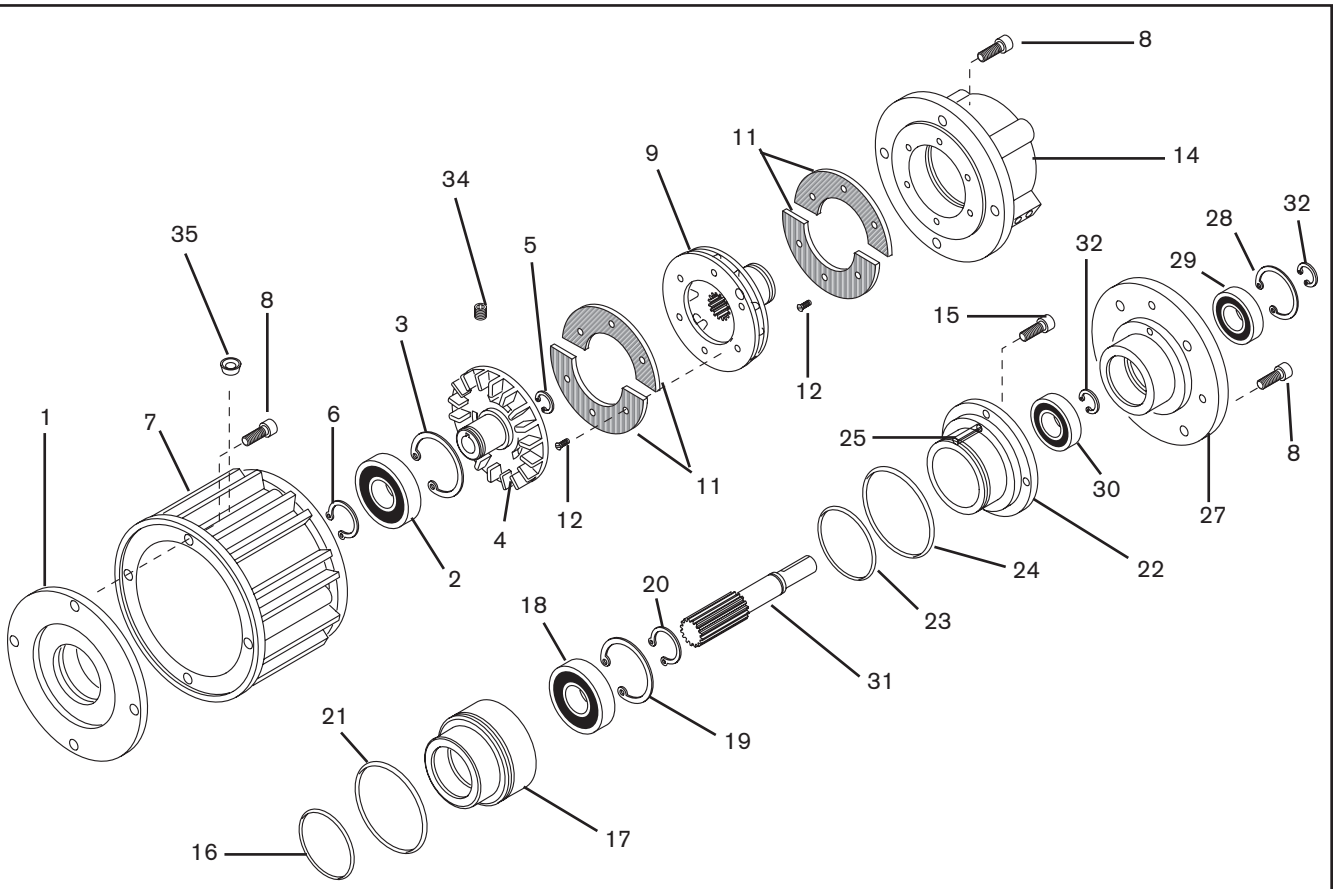


Figure 23

ITEM	DESCRIPTION	QTY
1	Female Pilot	1
2[1]	Bearing	1
3	Retaining Ring (Int.)	1
4	Drive Disc	1
5	Retaining Ring (Int.)	1
6	Retaining Ring (Ext.)	1
7	Housing	1
8	Socket Head Cap Screw (M8-1.25)	12
9	Splined Disc	1
11[2]	Friction Facing	2
12[2]	Flat Head Screw (M6-1.0)	12
14	Air Chamber	1
15	Socket Head Cap Screw (M8-1.25)	4
16[1]	O-ring Seal	1
17	Piston	1
18[1]	Bearing	1

ITEM	DESCRIPTION	QTY
19	Retaining Ring (Int.)	1
20	Retaining Ring (Ext.)	1
21[1]	O-ring Seal	1
22	Cylinder	1
23[1]	O-ring Seal	1
24[1]	O-ring Seal	1
25	Slotted Spring Pin	1
27	Male Pilot	1
28	Retaining Ring (Int.)	1
29[1]	Bearing	1
30[1]	Bearing	1
31	Stub Shaft	1
32	Retaining Ring (Ext.)	2
33	Key (Not Shown)	1
34	Set Screw (M10-1.5)	1
35	Plug (0.250 NPTF)	1

[1] Denotes Repair Kit items found in Repair Kit #801638.
[2] Denotes Facing Kit items found in Facing Kit #801645 (two kits required per unit).

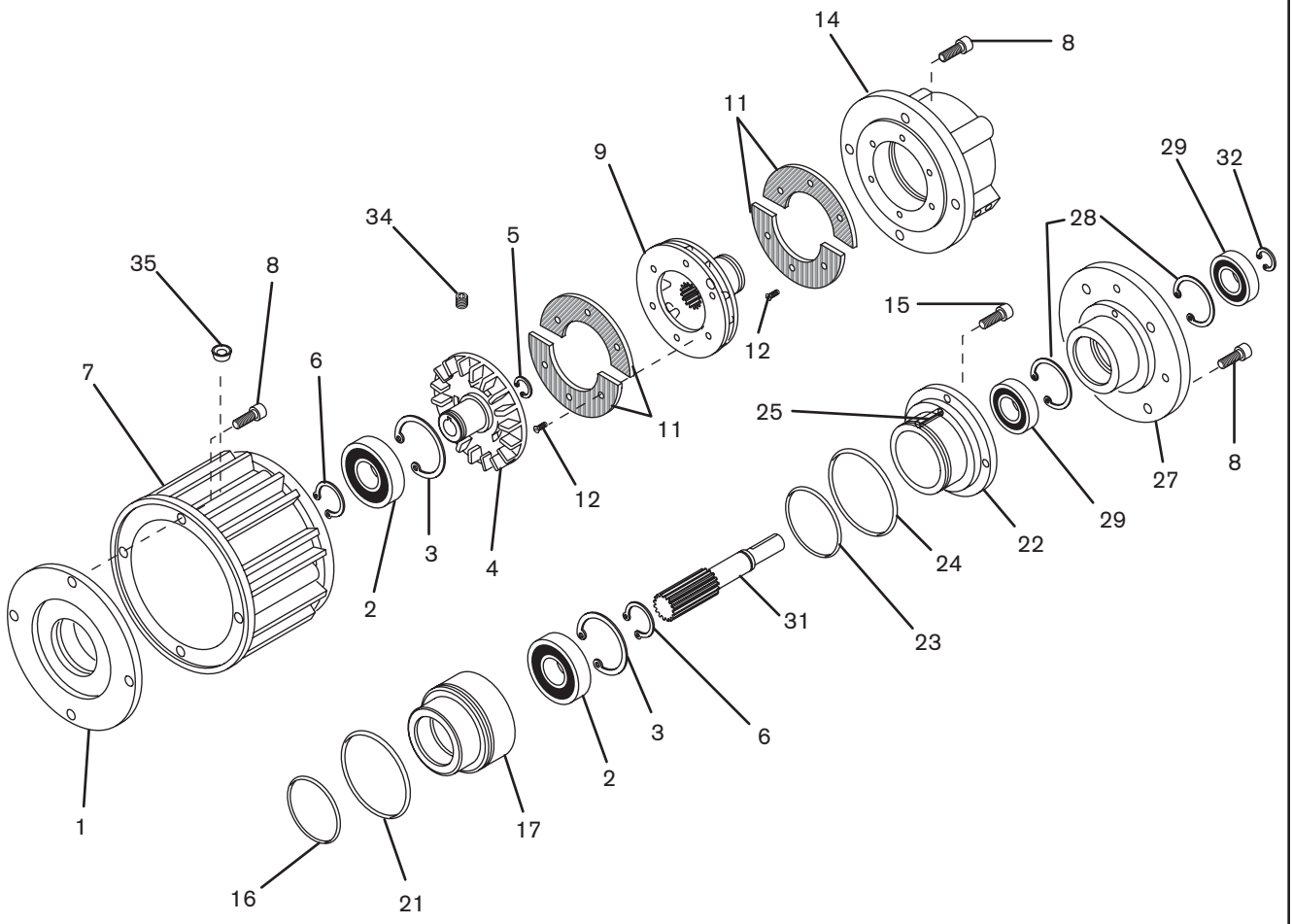


Figure 24

ITEM	DESCRIPTION	QTY
1	Female Pilot	1
2[1]	Bearing	2
3	Retaining Ring (Int.)	2
4	Drive Disc	1
5	Retaining Ring (Int.)	1
6	Retaining Ring (Ext.)	2
7	Housing	1
8	Socket Head Cap Screw (M10-1.5)	12
9	Splined Disc	1
11[2]	Friction Facing	2
12[2]	Flat Head Screw (M6-1.0)	12
14	Air Chamber	1
15	Socket Head Cap Screw (M10-1.5)	4
16[1]	O-ring Seal	1

ITEM	DESCRIPTION	QTY
17	Piston	1
21[1]	O-ring Seal	1
22	Cylinder	1
23[1]	O-ring Seal	1
24[1]	O-ring Seal	1
25	Slotted Spring Pin	1
27	Male Pilot	1
28	Retaining Ring (Int.)	2
29[1]	Bearing	2
31	Stub Shaft	1
32	Retaining Ring (Ext.)	1
33	Key (Not Shown)	1
34	Set Screw (M10-1.5)	1
35	Plug (0.250 NPTF)	1

[1] Denotes Repair Kit items found in Repair Kit #801639
[2] Denotes Facing Kit items found in Facing Kit #801647 (two kits required per unit).

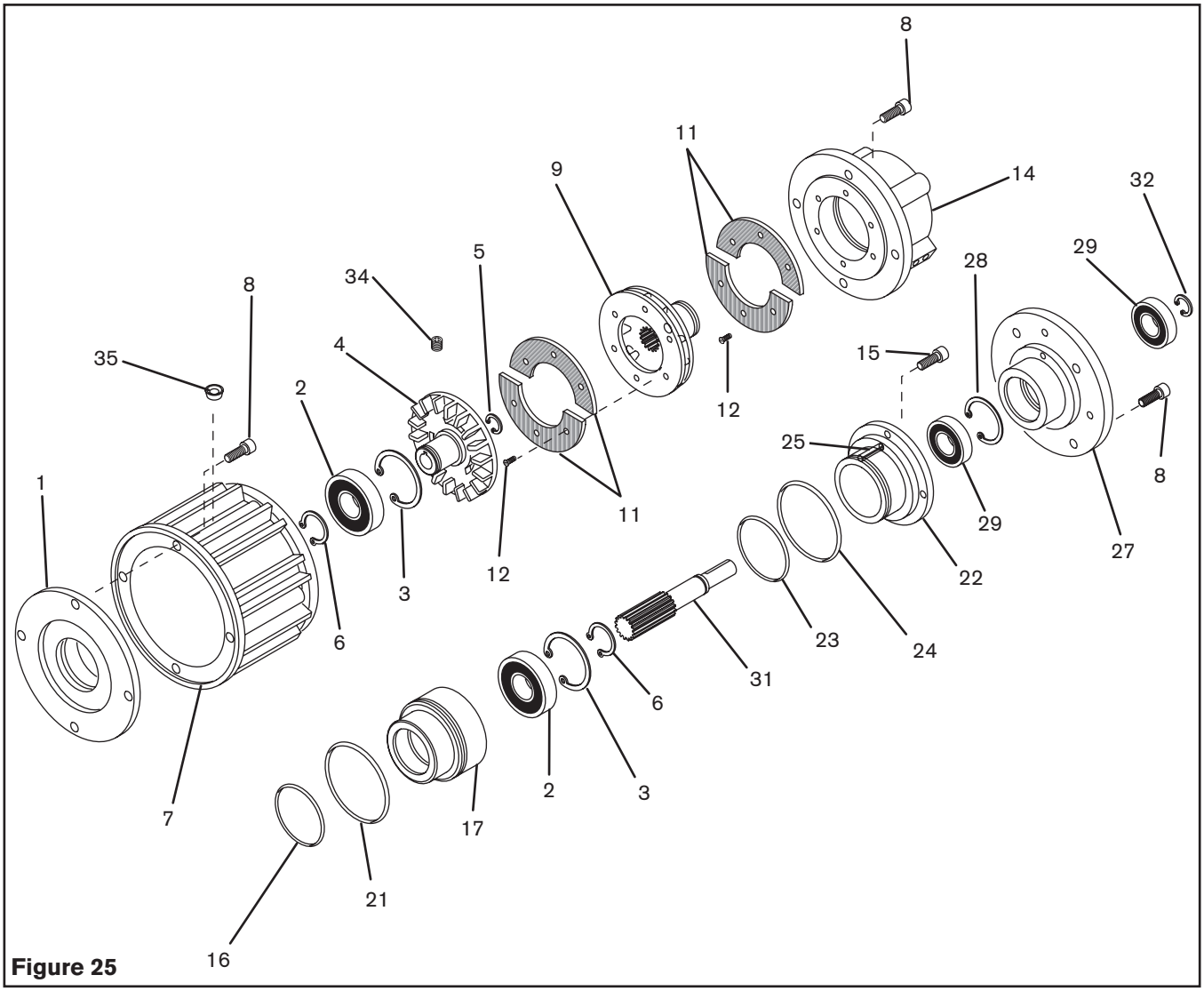


Figure 25

ITEM	DESCRIPTION	QTY
1	Female Pilot	1
2[1]	Bearing	2
3	Retaining Ring (Int.)	2
4	Drive Disc	1
5	Retaining Ring (Int.)	1
6	Retaining Ring (Ext.)	2
7	Housing	1
8	Socket Head Cap Screw (M10-1.5)	12
9	Splined Disc	1
11[2]	Friction Facing	2
12[2]	Flat Head Screw (M6-1.0)	12
14	Air Chamber	1
15	Socket Head Cap Screw (M10-1.5)	4
16[1]	O-ring Seal	1

ITEM	DESCRIPTION	QTY
17	Piston	1
21[1]	O-ring Seal	1
22	Cylinder	1
23[1]	O-ring Seal	1
24[1]	O-ring Seal	1
25	Slotted Spring Pin	1
27	Male Pilot	1
28	Retaining Ring (Int.)	1
29[1]	Bearing	2
31	Stub Shaft	1
32	Retaining Ring (Ext.)	1
33	Key (Not Shown)	1
34	Set Screw (M12-1.75)	1
35	Plug (0.250 NPTF)	1

[1] Denotes Repair Kit items found in Repair Kit #801640.
[2] Denotes Facing Kit items found in Facing Kit #801649 (two kits required per unit).

PARTS LIST - INPUT UNIT

MODELS 110-14

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
34	Retaining Ring (Int.)	1
35	Retaining Ring (Ext.)	2

[1] Denotes Repair Kit item found in Repair Kit #801437.

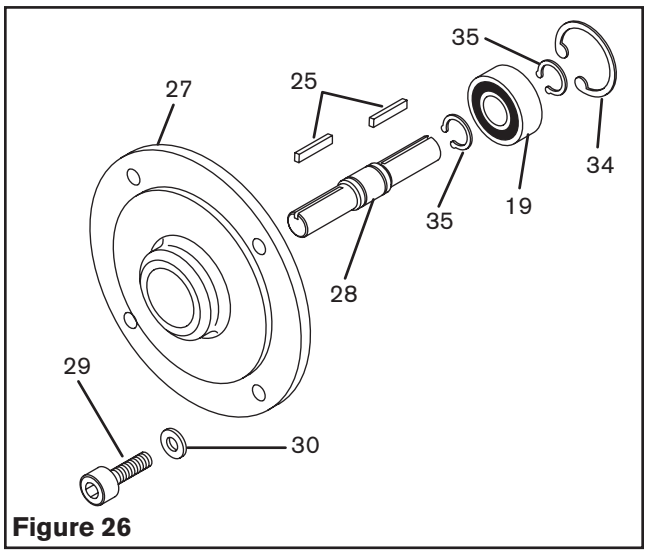


Figure 26

MODELS 130-19 AND 130-24

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 found in Repair Kit #801429.

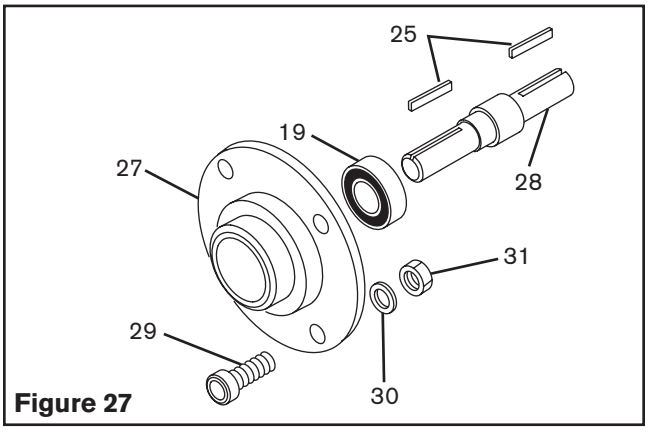


Figure 27

MODELS 7-28, 7-38, 8-38, AND 8-42

ITEM	DESCRIPTION	QTY
28	Retaining Ring (Int.)	*
29[1]	Bearing	1
32	Retaining Ring (Ext.)	2
33	Key	2
35	Flange	1
36	Shaft	1
37	Socket Head Cap Screw	4
38	Lock Washer	4

[1] Denotes Repair Kit item.
FMCBE 7-28 Repair Kit No. 801641
FMCBE 7-38 Repair Kit No. 801642
FMCBE 8-38 Repair Kit No. 801642
FMCBE 8-42 Repair Kit No. 801463

* FMCBE Models 7-28, 8-38 and 8-42 have two retaining rings. Model 7-38 has one retaining ring.

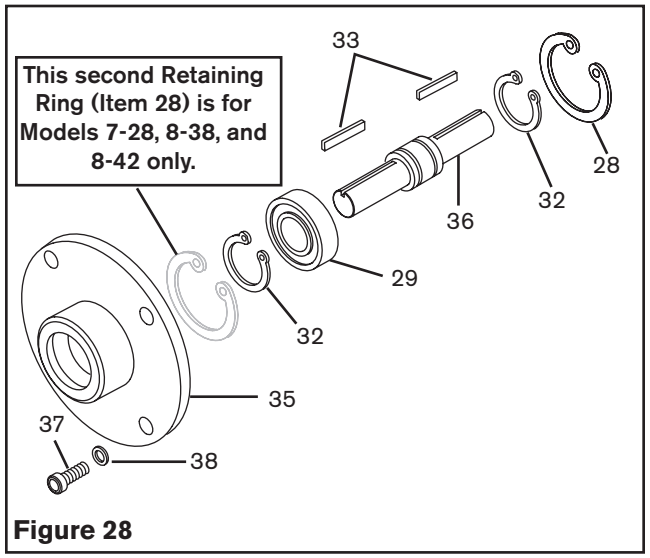


Figure 28

WARRANTY

Warranties
Nexen warrants that the Products will (a) be free from any defects in material or workmanship for a period of 12 months from the date of shipment, and (b) will meet and perform in accordance with the specifications in any engineering drawing specifically for the Product that is in Nexen's current product catalogue, or that is accessible at the Nexen website, or that is attached to this Quotation and that specifically refers to this Quotation by its number, subject in all cases to any limitations and exclusions set out in the drawing. 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 for the Buyer for any breach of any warranties provided in connection with this agreement will be, at the election of Nexen: (a) repair or replacement with new, serviceably used, or reconditioned parts or products; or (b) issuance of credit in the amount of the purchase price paid to Nexen by the Buyer for the Products.

Agent's Authority
Buyer agrees that no agent, employee or representative of Nexen has authority to bind Nexen to any affirmation, representation, or warranty concerning the Products other than those warranties expressly set forth herein.

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TO THE EXTENT PERMITTED BY LAW NEXEN SHALL HAVE NO LIABILITY TO BUYER OR ANY OTHER PERSON FOR INCIDENTAL DAMAGES, SPECIAL DAMAGES, CONSEQUENTIAL DAMAGES OR OTHER DAMAGES OF ANY KIND OR NATURE WHATSOEVER, WHETHER ARISING OUT OF BREACH OF WARRANTY OR OTHER BREACH OF CONTRACT, NEGLIGENCE OR OTHER TORT, OR OTHERWISE, EVEN IF NEXEN SHALL HAVE BEEN ADVISED OF THE POSSIBILITY OR LIKELIHOOD OF SUCH POTENTIAL LOSS OR DAMAGE. For all of the purposes hereof, the term "consequential damages" shall include lost profits, penalties, delay damages, 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.

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Buyer shall inspect all shipments of Products upon arrival and shall notify Nexen in writing, of any shortages or other failures to conform to these terms and conditions which are reasonably discoverable upon arrival without opening any carton or box in which the Products are contained. Such notice shall be sent within 14 days following arrival. All notifications shall be accompanied by packing slips, inspection reports and other documents necessary to support Buyer's claims. In addition to the foregoing obligations, in the event that Buyer receives Products that Buyer did not order, Buyer shall return the erroneously shipped Products to Nexen within thirty (30) days of the date of the invoice for such Products; Nexen will pay reasonable freight charges for the timely return of the erroneously shipped Products, and issue a credit to Buyer for the returned Products at the price Buyer paid for them, including any shipping expenses that Nexen charged Buyer. All shortages, overages and nonconformities not reported to Nexen as required by this section will be deemed waived.

Limitation on Actions
No action, regardless of form, arising out of any transaction to which these terms and conditions are applicable may be brought by the Buyer more than one year after the cause of action has accrued.

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