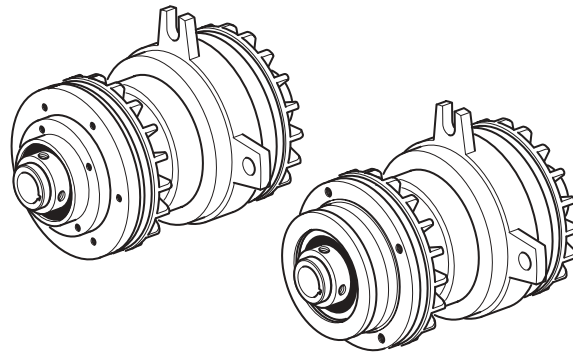
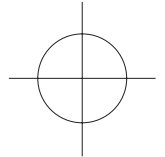


AIR CHAMP® PRODUCTS

User Manual



**PILOT, COUPLING, AND SHEAVE MOUNT CLUTCH-BRAKE
MODELS FWCB, LWCB, MWCB, AND HWCB**

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



DANGER

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.

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

ISO 9001 Certified



Table of Contents

INTRODUCTION -----	1
INSTALLATION -----	1
AIR CONNECTIONS -----	3
LUBRICATION -----	4
TROUBLESHOOTING -----	5
DISASSEMBLY—PILOT, COUPLING, AND SHEAVE MOUNT -----	6
PARTS REPLACEMENT—PILOT, COUPLING, AND SHEAVE MOUNT -----	8
REASSEMBLY—PILOT, COUPLING, AND SHEAVE MOUNT -----	13
REPLACEMENT PARTS -----	15
PARTS LIST -----	16
WARRANTY -----	24

Read this manual carefully, making full use of its explanations and instructions. The knowledge of the system, 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.

WARNING

This unit has rotating parts. A guard that will not restrict the flow of cooling air around the unit must be used if the unit is installed where injury to an operator could occur, as stated in the Occupational Safety and Health Act (OSHA), Standard (29 CFR 1910) Section 1910.219K.

INTRODUCTION

The Nexen Air Champ Clutch-Brake is an Air Champ Clutch and an Air Champ Brake combined into a single unit.

Because heat from both the clutch and brake are absorbed within the unit during engagement, caution must be used when a Clutch-Brake is applied on high speed, high cyclic applications. If heat generated from the clutching and braking of the Clutch-Brake becomes great enough that the surface temperature of the unit is 180° F [82.2° C] or higher, the unit may experience excessive facing wear and a reduction in bearing and o-ring life. The Clutch-Brake must be mounted on a bearing supported, through shaft.

Two separate air inlets provide independent clutching and braking action.

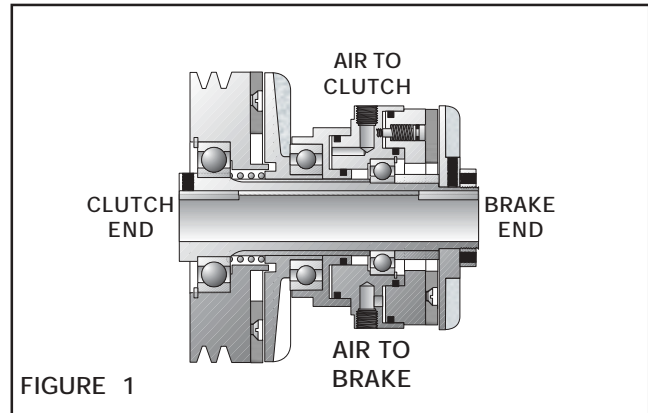


FIGURE 1

INSTALLATION

PILOT MOUNT CLUTCH-BRAKE

1. Secure a customer supplied sheave or sprocket to the Clutch-Brake (See Figure 2).
2. Insert the first Key (Item 30) into the shaft (See Figure 2).
3. Slide the Clutch-Brake onto shaft and key; then, insert the second Key (Item 30) (See Figure 2).
4. Tighten Set Screws (Items 27 and 28) to the recommended torque (See Table 1 and Figure 2).

NOTE

If a bushing for smaller diameter shafts is required, use a bushing on both ends of the Clutch-Brake.

5. Align air inlet ports to a six o'clock down position to allow condensation to drain out of exhaust port.
6. Fasten one of the ears of the Clutch-Brake to a fixed member of the machine (See Figure 2).

NOTE

The Piston Air Chamber (Item 7) floats axially approximately 1/16 inch [1.59 mm] during operation. Make sure securing pin allows 1/16 inch to 1/8 inch [1.59 mm to 3.18 mm] movement of Piston Air Chamber.

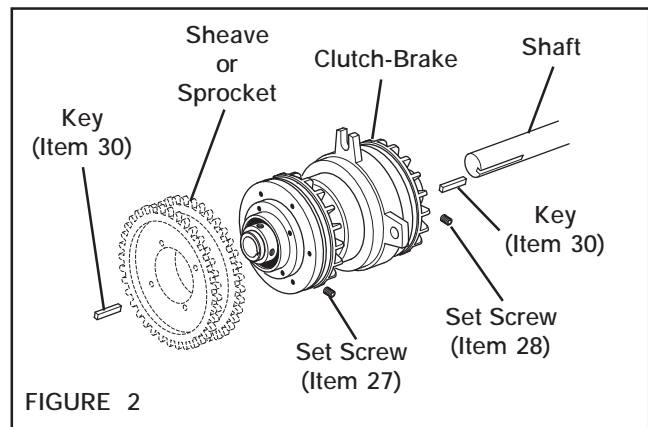


FIGURE 2

DESCRIPTION	FWCB	LWCB	MWCB	HWCB
Set Screw (Item 27)	35 In. Lbs. [3.9 N·m]	80 In. Lbs. [8.9 N·m]	80 In. Lbs. [8.9 N·m]	23 Ft. Lbs. [31.2 N·m]
Set Screw (Item 28)	20 In. Lbs. [2.2 N·m]	20 In. Lbs. [2.2 N·m]	80 In. Lbs. [8.9 N·m]	-- --

TABLE 1
RECOMMENDED TIGHTENING TORQUES

- Determine the parallel misalignment of shafts to be coupled by placing a straight edge across the shafts and measuring the maximum offset at various points around the periphery of the shafts. Make the necessary corrections to keep the shafts within parallel misalignment limits of the clutch coupling (See Figure 3 and Table 2).

NOTE

Before installation, the driving shaft can be fixed but the driven shaft must be allowed to "float" (See Figure 3).

Align the air inlet ports to the six o'clock down position to allow condensation to drain out of the exhaust port.

- Insert the first Key (Item 30) into driven shaft (See Figure 3).
- Slide Clutch-Brake Assembly onto the driven shaft (See Figure 3).
- Insert second Key (Item 30) (See Figure 3).
- Install and tighten Set Screws (Items 27 and 28) to the recommended torque (See Figure 3 and Table 3).
- Attach the Coupling Adapter Plate (Item 24) to the Clutch-Brake pilot using Cap Screws (Item 33) and Lock Washers (Item 34); then, tighten the Cap Screws to the recommended torque (See Figure 3 and Table 3).
- Place the Coupling's Flexible Disc (Item 25) over the pins in the Coupling Adapter Plate (Item 24) (See Figure 3).
- Insert the customer supplied Dodge™ Taper-Lock Bushing into the Coupling Hub (Item 26) (See Figure 3).
- Align the holes (not the threads) and slide the Dodge™ Taper-Lock Bushing Assembly onto the driving shaft until it is flush with the shaft (See Figure 3).
- Thread the screws into threaded holes in the Dodge™ Taper-Lock Bushing and Coupling Hub (Item 26); then, alternately and evenly tighten the screws to the bushing manufacturer's specifications.
- Align the pins in the Coupling Hub (Item 26) with the holes in the Flexible Disc (Item 25) (See Figure 3).
- Push the entire assembly together. Automatic spacing is accomplished by spacers molded into the Flexible Disc.
- Fasten one of the ears of the Clutch-Brake to a fixed member of the machine.

NOTE

The Piston Air Chamber (Item 7) floats laterally approximately 1/16 inch [1.59 mm] during operation. Make sure the securing pin allows 1/16 inch to 1/8 inch [1.59 mm to 3.18 mm] movement.

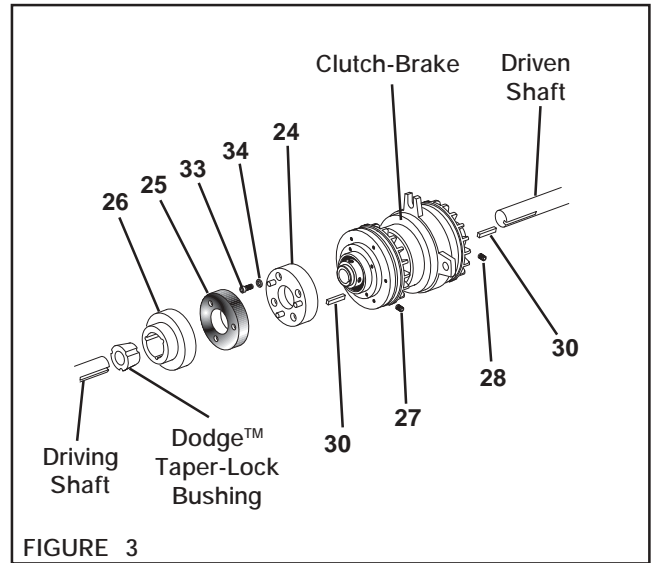


FIGURE 3

Model	Dodge™ Taper-Lock Poly-Disc Coupling Size	Measured Variation @ Points 180° Apart		Axial Float (Minimum Value From Recommended Initial Spacing)
		Parallel Maximum	Angular Maximum	
FWCB	2-5/8 In. [66.75 mm]	0.015 In. [0.381 mm]	0.040 In. [1.016 mm]	+1/8 In. [+1.375 mm]
LWCB	4 In. [101.6 mm]	0.015 In. [0.381 mm]	0.064 In. [1.625 mm]	+1/8 In. [+1.375 mm]
MWCB	7 In. [177.8 mm]	0.015 In. [0.381 mm]	0.112 In. [2.845 mm]	+1/8 In. [+1.375 mm]
HWCB	8 In. [203.2 mm]	0.015 In. [0.381 mm]	0.128 In. [3.251 mm]	+1/8 In. [+1.375 mm]

TABLE 2

DESCRIPTION	FWCB	LWCB	MWCB	HWCB
Set Screw (Item 27)	35 In. Lbs. [3.9 N•m]	80 In. Lbs. [8.9 N•m]	80 In. Lbs. [8.9 N•m]	23 Ft. Lbs. [31.2 N•m]
Set Screw (Item 28)	20 In. lbs. [2.2 N•m]	20 In. Lbs. [2.2 N•m]	80 In. Lbs. [8.9 N•m]	— —
Cap Screw (Item 33)	21 Ft. Lbs. [28.5 N•m]	21 Ft. Lbs. [28.5 N•m]	23 Ft. Lbs. [31.2 N•m]	78 Ft. Lbs. [105.8 N•m]

TABLE 3
 RECOMMENDED TIGHTENING TORQUES

1. Insert the first Key (Item 30) into the shaft (See Figure 4).
2. Slide the Clutch-Brake onto shaft and key; then, insert the second Key (Item 30) (See Figure 4).
3. Tighten Set Screws (Items 27 and 28) to the recommended torque (See Table 4 and Figure 4).

NOTE

If a bushing for smaller diameter shafts is required, use a bushing on both ends of the Clutch-Brake.

4. Align air inlet ports to a six o'clock down position to allow condensation to drain out of exhaust port.
5. Fasten one of the ears of the Clutch-Brake to a fixed member of the machine (See Figure 4).

NOTE

The Piston Air Chamber (Item 7) floats laterally approximately 1/16 inch [1.59 mm] during operation. Make sure securing pin allows 1/16 inch to 1/8 inch [1.59 mm to 3.18 mm] movement of Piston Air Chamber.

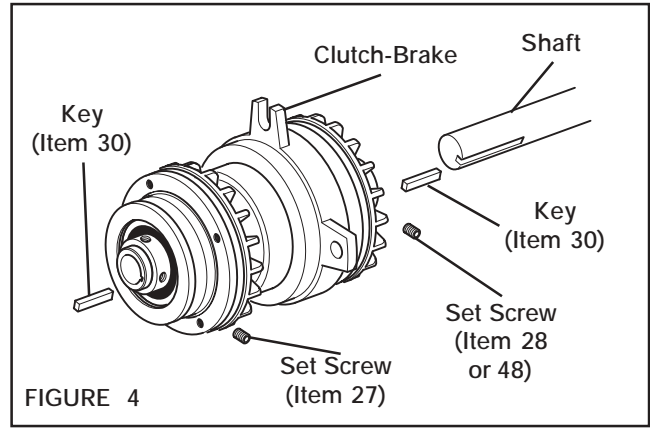


FIGURE 4

DESCRIPTION	FWCB	LWCB	MWCB	HWCB
Set Screw (Item 27)	35 In. Lbs. [3.9 N·m]	80 In. Lbs. [8.9 N·m]	80 In. Lbs. [8.9 N·m]	23 Ft. Lbs. [31.2 N·m]
Set Screw (Item 28)	20 In. Lbs. [2.2 N·m]	20 In. Lbs. [2.2 N·m]	80 In. Lbs. [8.9 N·m]	--

TABLE 4
RECOMMENDED TIGHTENING TORQUES

AIR CONNECTIONS

NOTE

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

4-WAY CONTROL VALVE

1. If the brake is to be set when the solenoid is de-energized, connect the port marked 2 to the brake and the port marked 4 to the clutch (See Figure 5).
2. Connect the air supply line to the inlet port marked 1 (See Figure 5).

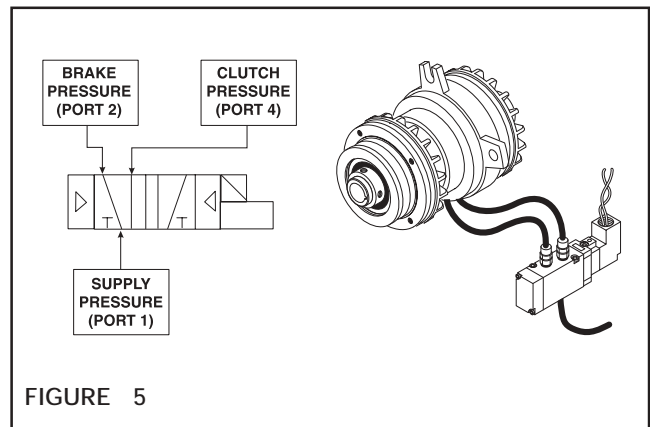


FIGURE 5

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 6).
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 6).

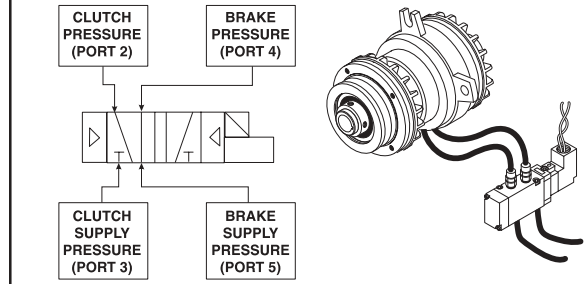


FIGURE 6

3-WAY CONTROL VALVES

1. Connect 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 7).
2. Connect an air supply line to the inlet port (marked IN) on the 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 7).

NOTE

When a 3-Way N.O. Control is de-energized, air flows directly to the brake. When a 3-Way N.O. Control is energized, air exhausts from the brake.

When a 3-Way N.C. Control is de-energized, air exhausts from the clutch. When a 3-Way N.C. Control is energized, air flows to the clutch.

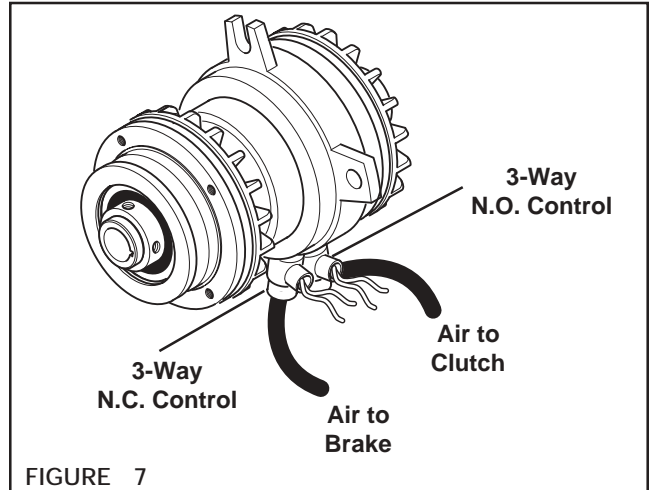


FIGURE 7

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

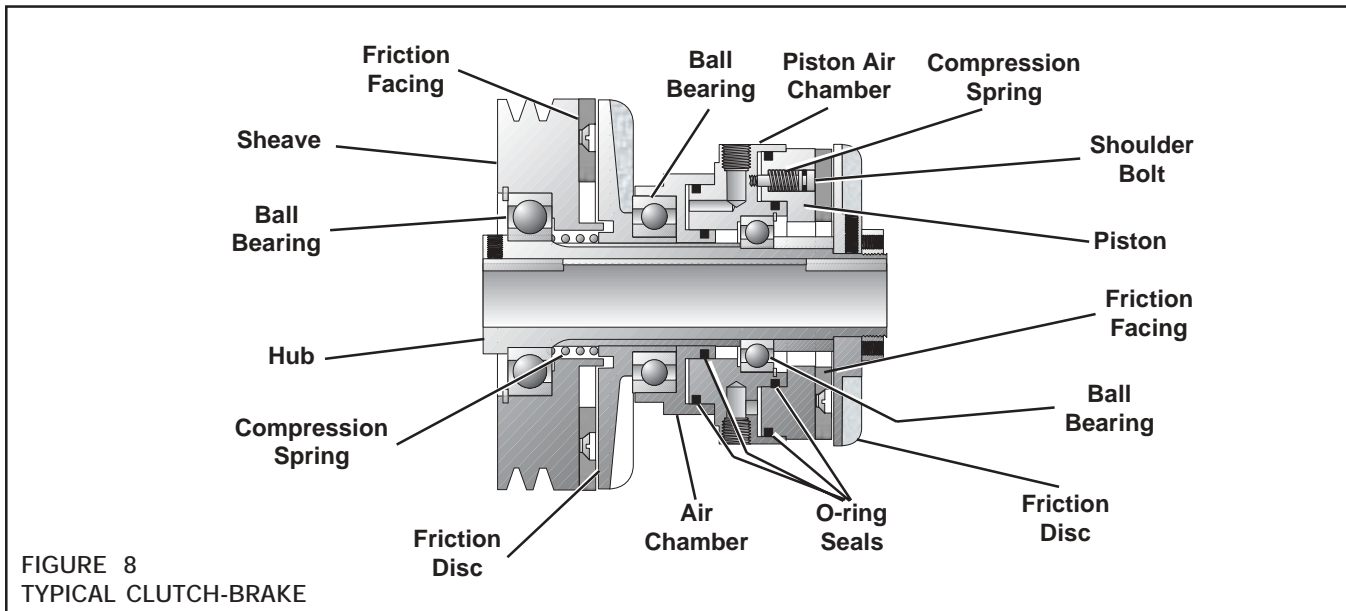
NOTE

These instructions and settings are for Nexen supplied lubricators only. They do not apply to lubricators not supplied by Nexen.

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 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.

TROUBLESHOOTING

PROBLEM	PROBABLE CAUSE	SOLUTION
Failure to engage.	Air not getting to the Clutch-Brake due to a control valve malfunction.	Check for control valve malfunction and replace valve if necessary.
	Air leaks.	Replace air lines.
	Lack of lubrication on the Hub spline or in the Air Chamber.	Lubricate Hub spline and/or Air Chamber.
	Rigid piping instead of flexible air lines.	Replace rigid piping with flexible air lines.
Failure to disengage.	Unexhausted air due to a control valve malfunction.	Check for control valve malfunction and replace if necessary.
	Friction lock due to a lack of lubrication on the Hub spline or in the Air Chamber.	Lubricate Hub spline and/or Air Chamber.
	Rigid piping instead of flexible air lines.	Replace air lines with flexible air line tubing.
	Weak or broken Compression Springs.	Replace Compression Springs.
Loss of torque.	Air Leaks.	Replace air lines.
	Overheating (fading).	Check manufacturing specifications to be certain Clutch-Brake is suitable for the application.
Overlap or simultaneous engagement of the clutch and brake when switching. Overlap can be verified by motor amperage readings when cycling with the Clutch-Brake versus clutch (brake disconnected). Higher draw with the Clutch-Brake indicates overlap.	Inadequate controls.	Install controls meeting the specification of Clutch-Brake.
	Air line too long between the valve and the Clutch-Brake.	Shorten air line between the valve and Clutch-Brake.
	Air pressure too high.	Reduce the air pressure.
	Lack of quick exhaust valves.	Install quick exhaust valves.



DISASSEMBLY—PILOT, COUPLING, AND SHEAVE MOUNT

NOTE

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

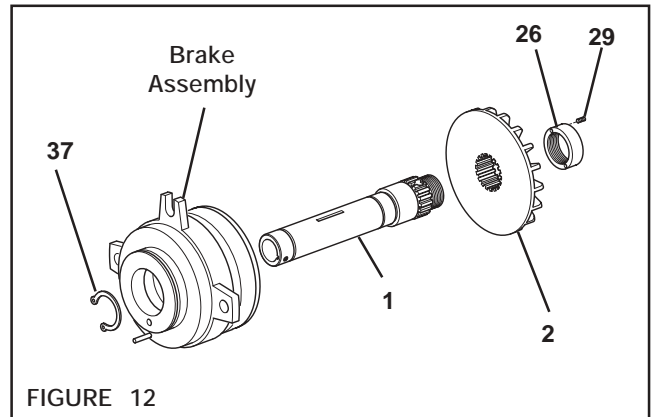
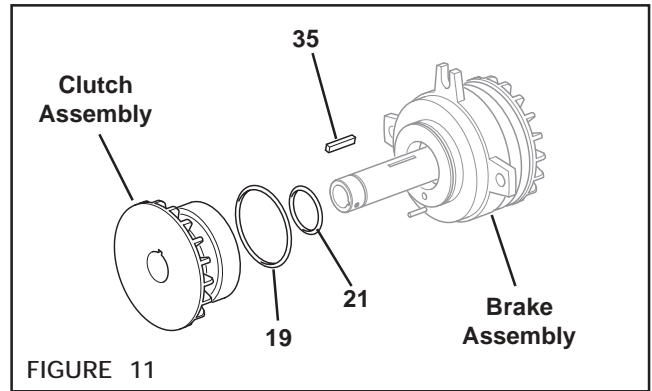
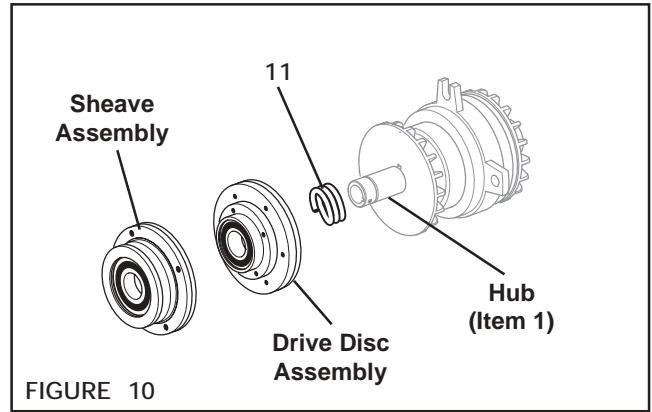
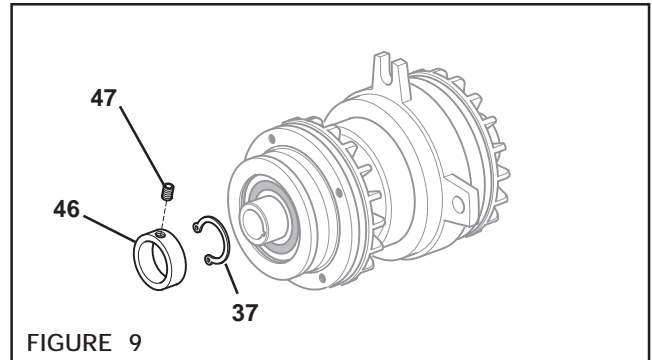
FWCB

1. Loosen the Set Screw (Item 47) and remove the Hub Collar (Item 46) from the Clutch-Brake (See Figure 9).

WARNING

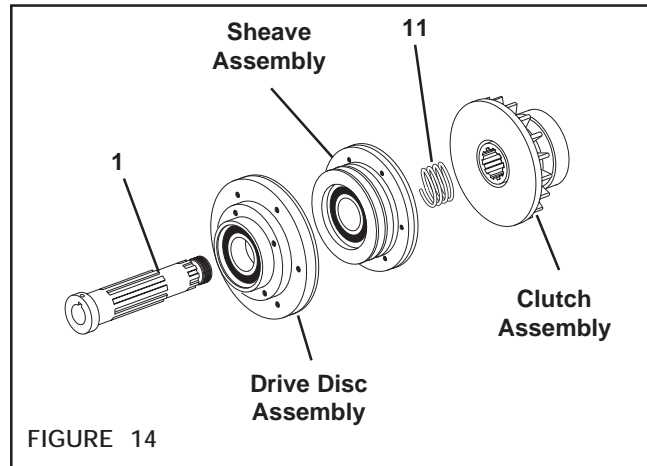
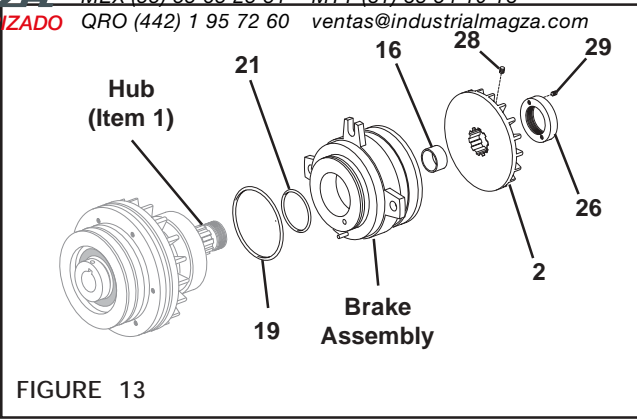
Special attention should be exercised when working with retaining rings. Always wear safety goggles when working with spring or tension loaded fasteners or devices.

2. Remove the Retaining Ring (Item 37) from the Clutch-Brake (See Figure 9).
3. Press the Drive Disc Assembly or the Sheave Assembly off the Hub (Item 1) (See Figure 10).
4. Slide the Compression Spring (Item 11) off the Hub (Item 1) (See Figure 10).
5. Slide the Clutch Assembly off the Hub (Item 1) (See Figure 11).
6. Remove the old O-ring Seals (Items 19 and 21) (See Figure 11).
7. Remove the Key (Item 35) (See Figure 11).
8. Remove the Retaining Ring (Item 37) (See Figure 12).
9. Loosen the Set Screw (Item 29) and remove the Locking Nut (Item 26) and slide the Brake Friction Disc (Item 2) off the Hub (Item 1) (See Figure 12).
10. Press the Brake Assembly off the Hub (Item 1) (See Figure 12).



LWCB AND MWCB

1. Loosen the Set Screws (Items 28 and 29); then, remove the Locking Nut (Item 26) and the Brake Friction Disc (Item 2) (See Figure 13).
2. Remove the Spacer (Item 16) (See Figure 13).
3. Press the Brake Assembly off the Hub (Item 1) (See Figure 13).
4. Remove the O-ring Seals (Items 19 and 21) (See Figure 13).
5. Slide the Clutch Assembly off the Hub (Item 1) (See Figure 14).
6. Slide the Compression Spring (Item 11) off the Hub (Item 1) (See Figure 14).
7. Press the Drive Disc Assembly or the Sheave Assembly off the Hub (Item 1) (See Figure 14).

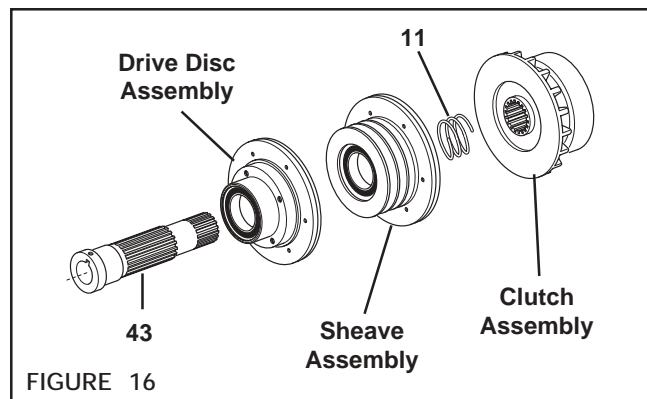
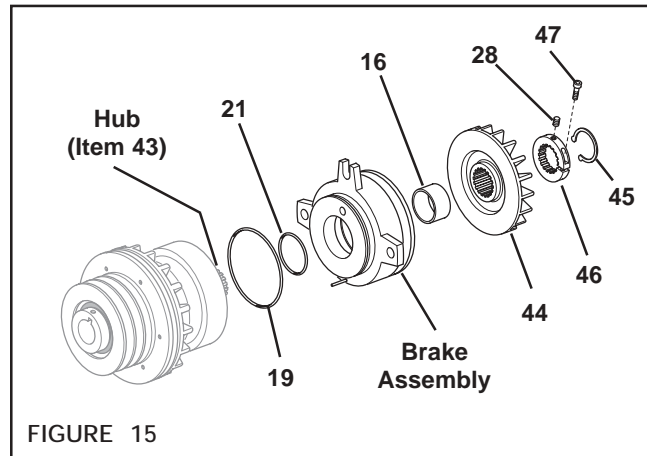


HWCB

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 45) from the Clutch-Brake (See Figure 15).
2. Loosen the Set Screw (Item 28) and the Socket Head Cap Screw (Item 47) securing the Locking Collar (Item 46); then, remove the Locking Collar (Item 46) and the Brake Friction Disc (Item 44) (See Figure 15).
3. Remove the Spacer (Item 16) (See Figure 15).
4. Press the Brake Assembly off the Hub (Item 43) (See Figure 15).
5. Remove the O-ring Seals (Items 19 and 21) (See Figure 15).
6. Slide the Clutch Assembly off the Hub (Item 43) (See Figure 16).
7. Slide the Compression Spring (Item 11) off the Hub (Item 43) (See Figure 16).
8. Press the Drive Disc Assembly or the Sheave Assembly off the Hub (Item 43) (See Figure 16).



PARTS REPLACEMENT—PILOT, COUPLING, AND SHEAVE MOUNT

NOTE

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

FWCB

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 41) from the Sheave (Item 12) or Pilot Drive Disc (Item 33) (See Figure 17 or 18).
2. Press the old Ball Bearing (Item 13) out of the Sheave (Item 12) or old Ball Bearing (Item 34) out of the Pilot Drive Disc (Item 33) (See Figure 17 or 18).

NOTE

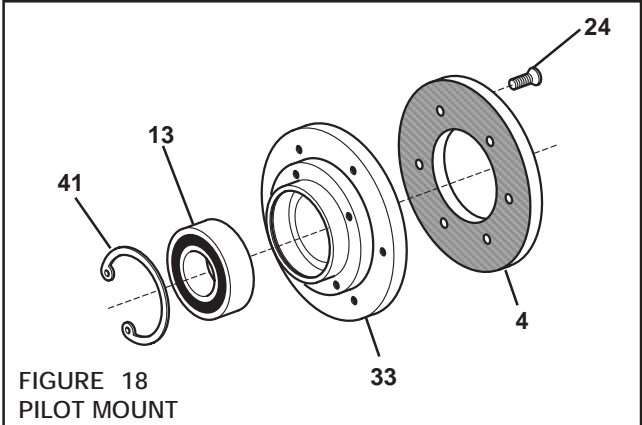
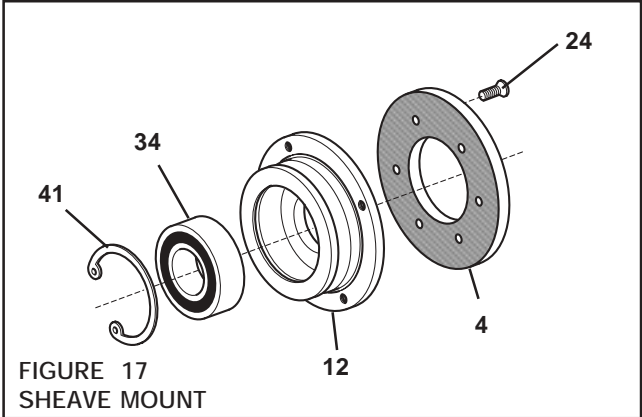
Do not reuse the old ball bearings. Applying force on the inner race of a ball bearing to remove a ball bearing held by the outer race causes damage to the bearing.

3. Clean the bearing bore of the Sheave (Item 12) or Pilot Drive Disc (Item 33) with fresh safety solvent, making sure all old Loctite residue is removed (See Figure 17 or 18).
4. Apply an adequate amount of Loctite® 680 to evenly coat the outer race of the new Ball Bearing (Item 13 or 34) (See Figure 17 or 18).
5. Support the Sheave (Item 12) or the Pilot Drive Disc (Item 33) and pressing on the outer race of the new Ball Bearing (Item 13 or 34), press the new Ball Bearing (Item 13 or 34) into the Sheave or Pilot Drive Disc (See Figure 17 or 18).
6. Reinstall the Retaining Ring (Item 41) (See Figure 17 or 18).

NOTE

The Flat Head Machine Screws are assembled with an anaerobic 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 this locking compound and allow removal of the Flat Head Machine Screws. Never use an impact wrench to remove the Flat Head Machine Screws.

7. Remove the old Flat Head Machine Screws (Item 24) securing the Friction Facing (Item 4) to the Sheave (Item 12) or Pilot Drive Disc (Item 33) (See Figure 17 or 18).
8. Remove the old Friction Facing (Item 4) (See Figure 17 or 18).
9. Install the new Friction Facing (Item 4) and tighten the new Flat Head Machine Screws (Item 24) to 26 In. Lbs. [2.9 N•m] torque (See Figure 17 or 18).



10. Fully support the Air Chamber (Item 8) and press the Clutch Friction Disc (Item 9) out of the Air Chamber (See Figure 19).

NOTE

If the Ball Bearing (Item 14) comes out of the Air Chamber (Item 8), use a bearing puller to remove it from the Clutch Friction Disc (Item 9). If the Ball Bearing remains in the Air Chamber (Item 8), use a die remover to remove it from the Air Chamber.

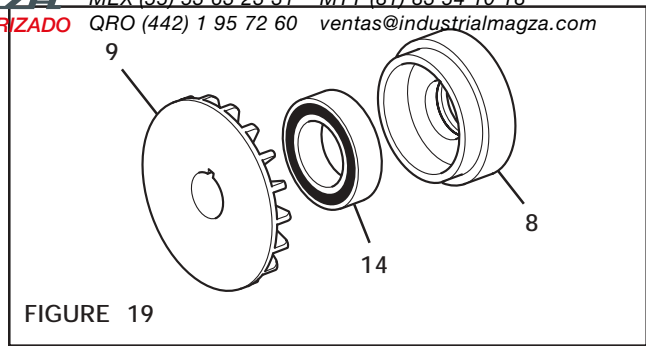


FIGURE 19

11. Clean the bearing bore of the Air Chamber (Item 8) with fresh safety solvent, making sure all old Loctite® residue is removed (See Figure 19).

12. Apply an adequate amount of Loctite® 680 to evenly coat the outer race of the new Ball Bearing (Item 14). (See Figure 19).

13. Carefully align the O.D. of the new Ball Bearing (Item 14) with the bore of the Air Chamber (Item 8) and press the new Ball Bearing into place (See Figure 19).

14. Carefully align the hub of the Clutch Friction Disc (Item 9) with the bore of the new Ball Bearing (Item 14) and press the Clutch Friction Disc into the new Ball Bearing and Air Chamber (Item 8) (See Figure 19).

15. Remove the old Flat Head Machine Screws (Item 24) and Friction Facing (Item 4) from the Piston (Item 3) (See Figure 20).

16. Remove the old Shoulder Bolts (Item 5), Shoulder Bolt O-rings (Item 22), and Compression Springs (Item 6) (See Figure 20).

17. Separate the Piston Air Chamber (Item 7) and Piston (Item 3) (See Figure 20).

18. Remove the old O-ring Seals (Items 18 and 20) from the Piston Air Chamber (Item 7) and Piston (Item 3) (See Figure 20).

19. Remove the Retaining Ring (Item 17) (See Figure 20).

20. Press the old Ball Bearing (Item 13) out of the Piston Air Chamber (Item 7) (See Figure 20).

21. Clean the bearing bore of the Piston Air Chamber (Item 7) with fresh safety solvent, making sure all old Loctite® residue is removed (See Figure 20).

22. Apply an adequate amount of Loctite® 680 to evenly coat the outer race of the new Ball Bearing (Item 13) (See Figure 20).

23. Carefully align the O.D. of the new Ball Bearing (Item 13) with the bore of the Piston Air Chamber and press the new Ball Bearing into place.

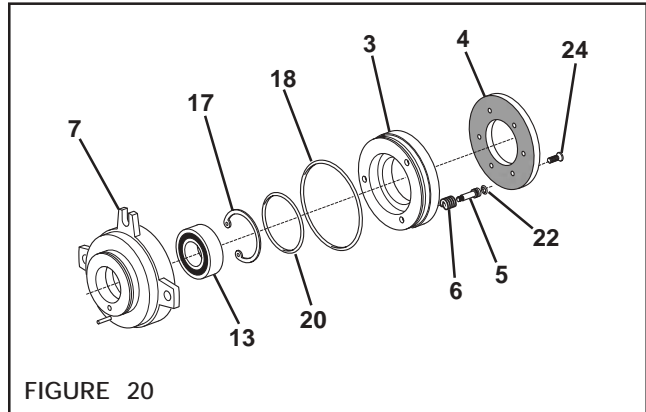


FIGURE 20

24. Reinstall the Retaining Ring (Item 17) (See Figure 20).

25. Clean all o-ring grooves and o-ring contact surfaces with fresh safety solvent and lubricate the o-ring grooves and contact surfaces with fresh o-ring lubricant.

26. Lubricate the new O-ring Seals (Items 18, 20, and 22) with fresh o-ring lubricant and install the new O-ring Seals (See Figure 20).

27. Press the Piston (Item 3) into the Piston Air Chamber (Item 7) (See Figure 20).

28. Apply Loctite® 242 to the threads of the Shoulder Bolts (Item 5); then, install the new Compression Springs (Item 6) and Shoulder Bolts (Item 5) with new O-ring Seals (Item 22) (See Figure 20).

29. Tighten the Shoulder Bolts (Item 5) to 43 In. Lbs. [4.8 N•m] torque (See Figure 20).

30. Install the new Friction Facing (Item 4) and tighten the new Flat Head Machine Screws (Item 24) to 26 In. Lbs. [2.9 N•m] torque (See Figure 20).

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 41) from the Sheave (Item 12) or Pilot Drive Disc (Item 33) (See Figure 21 or 22).
2. Press the old Ball Bearing (Item 15) out of the Sheave (Item 12) or Ball Bearing (Item 34) out of the Pilot Drive Disc (Item 33) (See Figure 21 or 22).

NOTE

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

3. Clean the bearing bore of the Sheave (Item 12) or Pilot Drive Disc (Item 33) with fresh safety solvent, making sure all old Loctite® residue is removed (See Figure 22).
4. Apply an adequate amount of Loctite® 680 to evenly coat the outer race of the new Ball Bearing (Item 15 or 34) (See Figure 21 or 22).
5. Support the Sheave (Item 12) or the Pilot Drive Disc (Item 33) and pressing on the outer race of the new Ball Bearing (Item 15 or 34), press the new Ball Bearing (Item 15 or 34) into the Sheave or Pilot Drive Disc (See Figure 21 or 22).
6. Reinstall the Retaining Ring (Item 41) (See Figure 21 or 22).

NOTE

The Flat Head Machine Screws are assembled with an anaerobic 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 this locking compound and allow removal of the Flat Head Machine Screws. Never use an impact wrench to remove the Flat Head Machine Screws.

On the LWCB, the Flat Head Machine Screws securing the Friction Facing (Item 10) are Item 24. On the MWCB, the Flat Head Machine Screws securing the Friction Facing (Item 10) are Item 25.

7. Remove the old Flat Head Machine Screws (Item 24 or 25) securing the Friction Facing (Item 10) to the Sheave (Item 12) or Pilot Drive Disc (Item 33) (See Figure 21 or 22).
8. Remove the old Friction Facing (Item 10) (See Figure 21 or 22).
9. Install the new Friction Facing (Item 10) and tighten the new Flat Head Machine Screws (Item 24 or 25) to 26 In. Lbs. [2.9 N•m] torque (See Figure 21 or 22).
10. Fully support the Air Chamber (Item 8) and press the Clutch Friction Disc (Item 9) out of the Air Chamber (See Figure 23).

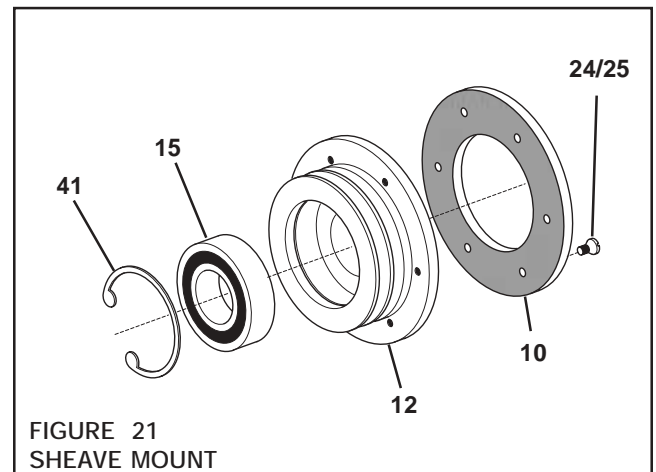


FIGURE 21
SHEAVE MOUNT

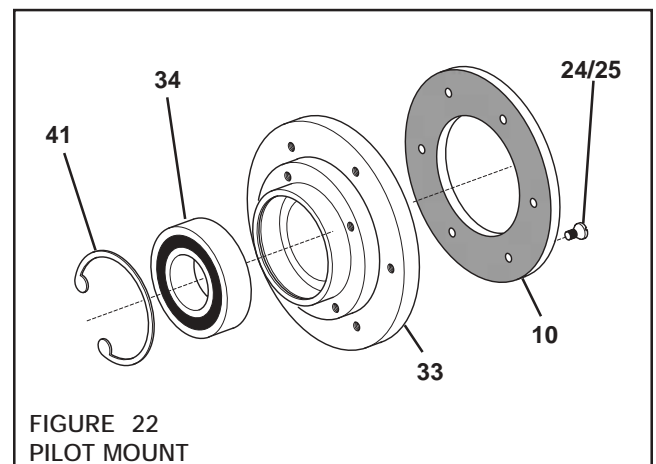


FIGURE 22
PILOT MOUNT

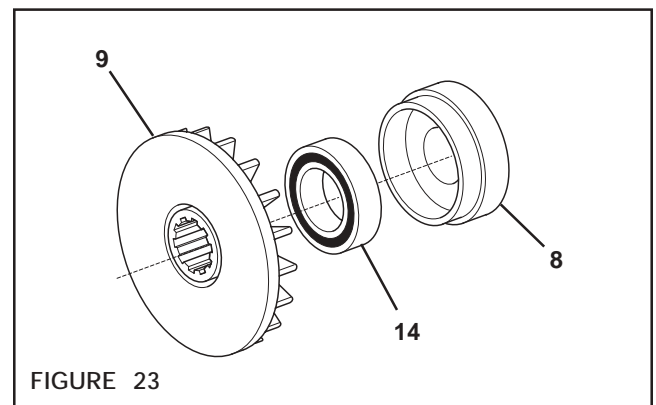
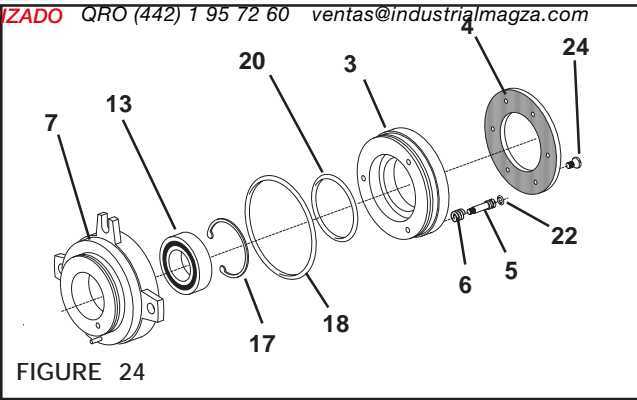


FIGURE 23

NOTE

If the Ball Bearing (Item 14) comes out of the Air Chamber (Item 8), use a bearing puller to remove it from the Clutch Friction Disc (Item 9). If the Ball Bearing remains in the Air Chamber (Item 8), use a die remover to remove it from the Air Chamber.

11. Clean the bearing bore of the Air Chamber (Item 8) with fresh safety solvent, making sure all old Loctite® residue is removed (See Figure 23).
12. Apply an adequate amount of Loctite® 680 to evenly coat the outer race of the new Ball Bearing (Item 14) (See Figure 23).
13. Carefully align the O.D. of the new Ball Bearing (Item 14) with the bore of the Air Chamber (Item 8) and press the new Ball Bearing into place (See Figure 23).
14. Carefully align the hub of the Clutch Friction Disc (Item 9) with the bore of the new Ball Bearing (Item 14) and press the Clutch Friction Disc into the new Ball Bearing and Air Chamber (Item 8) (See Figure 23).
15. Remove the old Flat Head Machine Screws (Item 24) and Friction Facing (Item 4) from the Piston (Item 3) (See Figure 24).
16. Remove the Shoulder Bolts (Item 5), Shoulder Bolt O-rings (Item 22), and Compression Springs (Item 6) (See Figure 24).
17. Separate the Piston Air Chamber (Item 7) and Piston (Item 3) (See Figure 24).
18. Remove the old O-ring Seals (Items 18 and 20) from the Piston Air Chamber (Item 7) and Piston (Item 3) (See Figure 24).
19. Remove the Retaining Ring (Item 17) (See Figure 24).
20. Press the old Ball Bearing (Item 13) out of the Piston Air Chamber (Item 7) (See Figure 24).
21. Clean the bearing bore of the Piston Air Chamber (Item 7) with fresh safety solvent, making sure all old Loctite® residue is removed (See Figure 24).



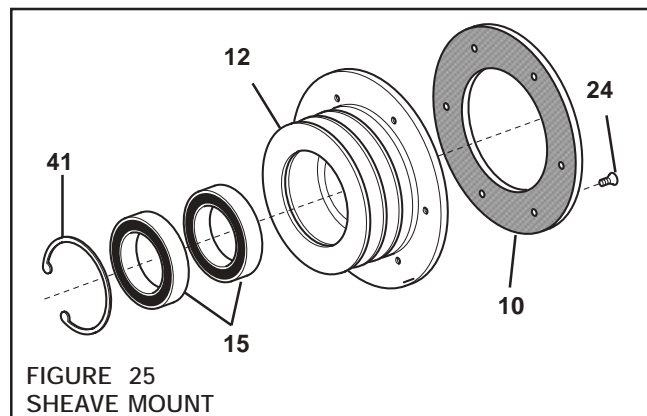
22. Apply an adequate amount of Loctite® 680 to evenly coat the outer race of the new Ball Bearing (Item 13) (See Figure 24).
23. Carefully align the O.D. of the new Ball Bearing (Item 13) with the bore of the Piston Air Chamber and press the new Ball Bearing into place.
24. Reinstall the Retaining Ring (Item 17) (See Figure 24).
25. Clean all o-ring grooves and o-ring contact surfaces with fresh safety solvent and lubricate the o-ring grooves and contact surfaces with fresh o-ring lubricant.
26. Lubricate the new O-ring Seals (Items 18, 20, and 22) with fresh o-ring lubricant and install the new O-ring Seals (See Figure 24).
27. Press the Piston (Item 3) into the Piston Air Chamber (Item 7) (See Figure 24).
28. Apply Loctite® 242 to the threads of the Shoulder Bolts (Item 5); then, install the new Compression Springs (Item 6) and Shoulder Bolts (Item 5) with new O-ring Seals (Item 22) (See Figure 24).
29. Tighten the Shoulder Bolts (Item 5) to 43 In. Lbs. [4.8 N·m] torque (See Figure 24).
30. Install the new Friction Facing (Item 4) and tighten the new Flat Head Machine Screws (Item 24) to 26 In. Lbs. [2.9 N·m] torque (See Figure 24).

HWCB

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 41) from the Sheave (Item 12) or Pilot Drive Disc (Item 33) (See Figure 25 or 26).
2. Press the old Ball Bearings (Item 15) out of the Sheave (Item 12) or the Pilot Drive Disc (Item 33) (See Figure 25 or 26).



NOTE

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

3. Clean the bearing bore of the Sheave (Item 12) or Pilot Drive Disc (Item 33) with fresh safety solvent, making sure that all old Loctite® residue is removed (See Figures 25 or 26).
4. Apply an adequate amount of Loctite® 680 to evenly coat the outer race of the new Ball Bearings (Item 15) (See Figure 25 or 26).
5. Support the Sheave (Item 12) or the Pilot Drive Disc (Item 33) and pressing on the outer race of the new Ball Bearings (Item 15), press the new Ball Bearings (Item 15) into the Sheave or Pilot Drive Disc (See Figure 25 or 26).
6. Reinstall the Retaining Ring (Item 41) (See Figure 25 or 26).

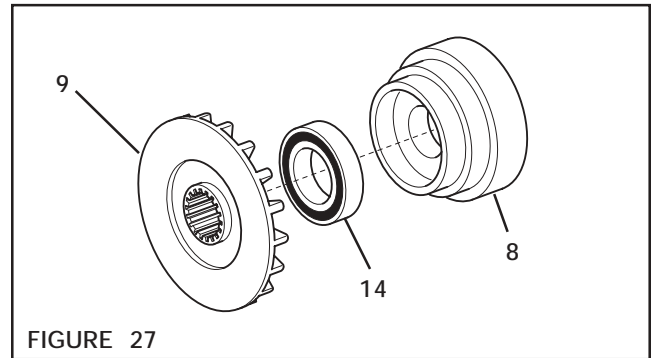
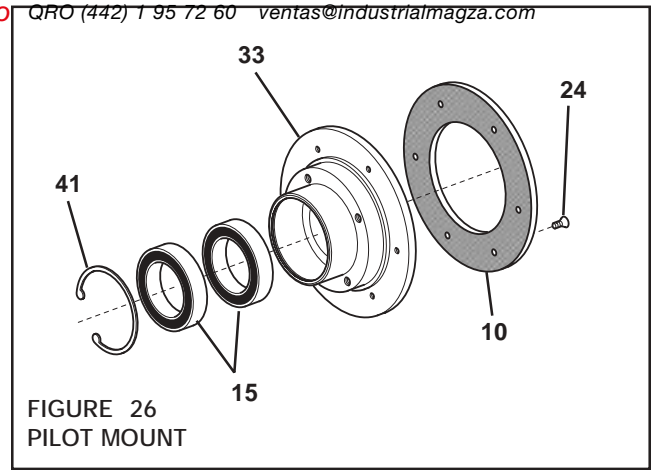
NOTE

The Flat Head Machine Screws are assembled with an anaerobic 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 this locking compound and allow removal of the Flat Head Machine Screws. Never use an impact wrench to remove the Flat Head Machine Screws.

7. Remove the old Flat Head Machine Screws (Item 24) securing the Friction Facing (Item 10) to the Sheave (Item 12) or Pilot Drive Disc (Item 33) (See Figure 25 or 26).
8. Remove the old Friction Facing (Item 10) (See Figure 25 or 26).
9. Install the new Friction Facing (Item 10) and tighten the new Flat Head Machine Screws (Item 24) to 43 In. Lbs. [4.8 N·m] torque (See Figure 25 or 26).
10. Fully support the Air Chamber (Item 8) and press the Clutch Friction Disc (Item 9) out of the Air Chamber (See Figure 27).

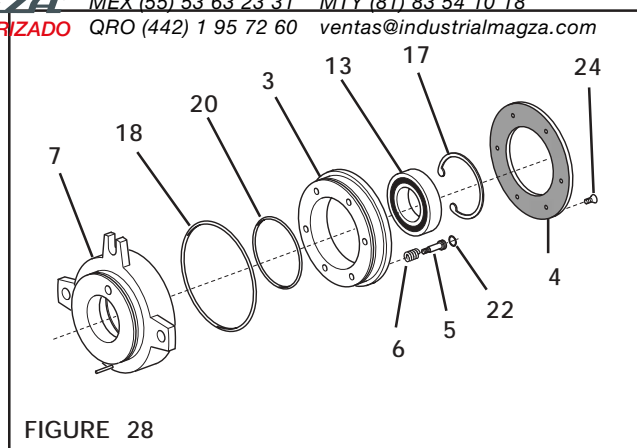
NOTE

If the Ball Bearing (Item 14) comes out of the Air Chamber (Item 8), use a bearing puller to remove it from the Clutch Friction Disc (Item 9). If the Ball Bearing remains in the Air Chamber (Item 8), use a die remover to remove it from the Air Chamber.



11. Clean the bearing bore of the Air Chamber (Item 8) with fresh safety solvent, making sure all old Loctite® residue is removed (See Figure 27).
12. Apply an adequate amount of Loctite® 680 to evenly coat the outer race of the new Ball Bearing (Item 14) (See Figure 27).
13. Carefully align the O.D. of the new Ball Bearing (Item 14) with the bore of the Air Chamber (Item 8) and press the new Ball Bearing into place (See Figure 27).
14. Carefully align the hub of the Clutch Friction Disc (Item 9) with the bore of the new Ball Bearing (Item 14) and press the Clutch Friction Disc into the new Ball Bearing and Air Chamber (Item 8) (See Figure 27).

15. Remove the old Flat Head Machine Screws (Item 24) and Friction Facing (Item 4) from the Piston (Item 3) (See Figure 28).
16. Remove the Shoulder Bolts (Item 5), Shoulder Bolt O-rings (Item 22), and Compression Springs (Item 6) (See Figure 28).
17. Separate the Piston Air Chamber (Item 7) and Piston (Item 3) (See Figure 28).
18. Remove the old O-ring Seals (Items 18 and 20) from the Piston Air Chamber (Item 7) and Piston (Item 3) (See Figure 28).



19. Remove the Retaining Ring (Item 17) (See Figure 28).
20. Press the old Ball Bearing (Item 13) out of the Piston Air Chamber (Item 7) (See Figure 28).
21. Clean the bearing bore of the Piston Air Chamber (Item 7) with fresh safety solvent, making sure all old Loctite® residue is removed (See Figure 28).
22. Apply an adequate amount of Loctite® 680 to evenly coat the outer race of the new Ball Bearing (Item 13) (See Figure 28).
23. Carefully align the O.D. of the new Ball Bearing (Item 13) with the bore of the Piston Air Chamber and press the new Ball Bearing into place.
24. Reinstall the Retaining Ring (Item 17) (See Figure 28).
25. Clean all o-ring grooves and o-ring contact surfaces with fresh safety solvent and lubricate the o-ring grooves and contact surfaces with fresh o-ring lubricant.

26. Lubricate the new O-ring Seals (Items 18, 20, and 22) with fresh o-ring lubricant and install the new O-ring Seals (See Figure 28).
27. Press the Piston (Item 3) into the Piston Air Chamber (Item 7) (See Figure 28).
28. Apply Loctite® 242 to the threads of the Shoulder Bolts (Item 5); then, install the new Compression Springs (Item 6) and Shoulder Bolts (Item 5) with new O-rings Seals (Item 22) (See Figure 28).
29. Tighten the Shoulder Bolts (Item 5) to 60 In. Lbs. [6.8 N•m] torque (See Figure 28).
30. Install the new Friction Facing (Item 4) and tighten the new Flat Head Machine Screws (Item 24) to 43 In. Lbs. [4.8 N•m] torque (See Figure 28).

REASSEMBLY—PILOT, COUPLING, AND SHEAVE MOUNT

NOTE

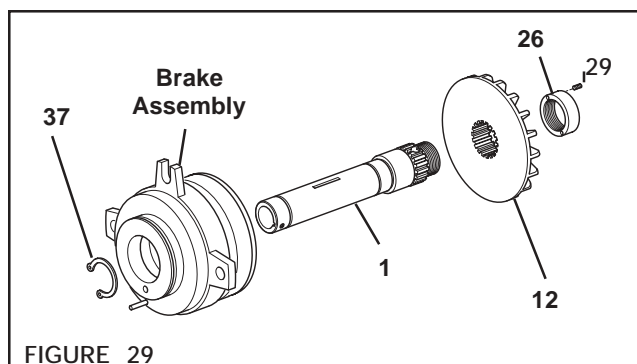
The following sections are arranged by model. Verify that you are in the correct section for your model.

FWCB

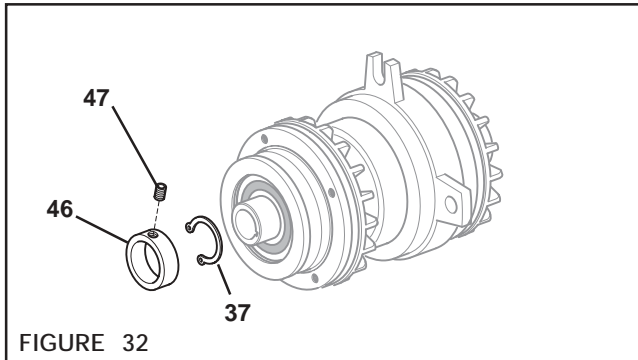
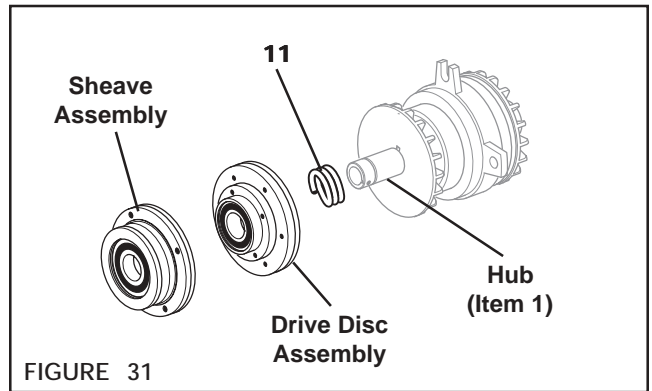
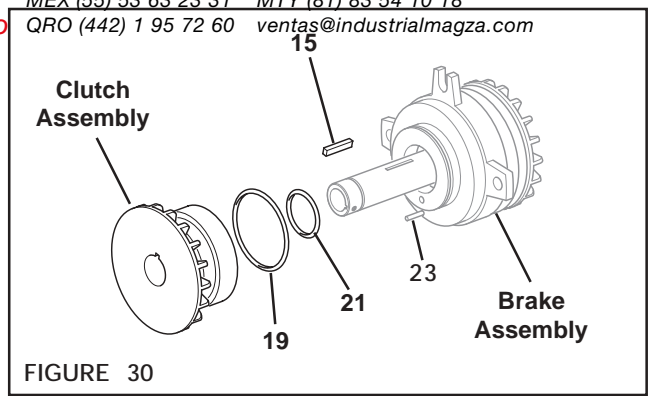
WARNING

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. Press the Brake Assembly onto the Hub (Item 1) and reinstall the Retaining Ring (Item 37) (See Figure 29).
2. Slide the Brake Friction Disc (Item 2) onto the Hub and install the Locking Nut (Item 26) (See Figure 29).
3. Reinstall and tighten the Set Screws (Item 29) to 20 In. Lbs. [2.2 N•m] torque (See Figure 29).

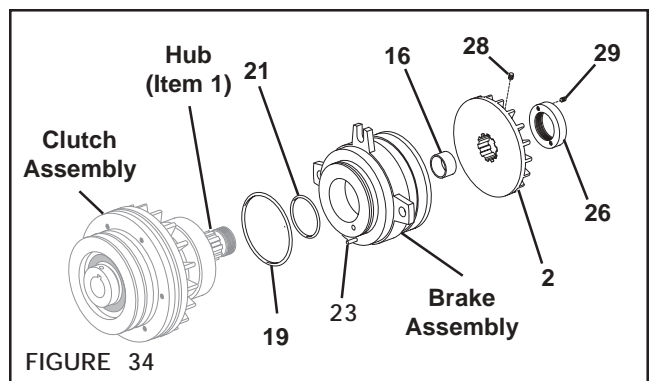
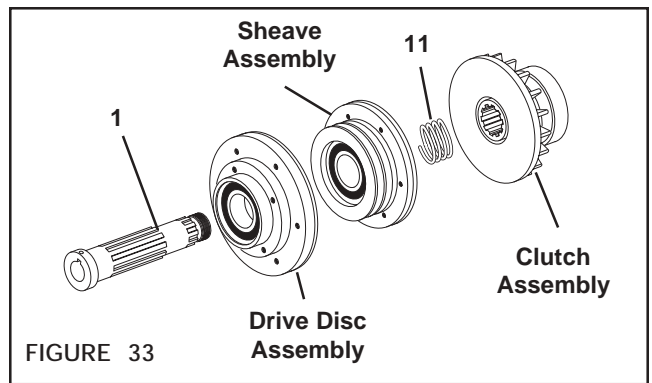


4. Lubricate the new O-ring Seals (Items 19 and 21) with fresh o-ring lubricant; then, install the new O-rings Seals onto the Brake and Clutch Assemblies (See Figure 30).
5. Reinstall the Key (Item 15) (See Figure 30).
6. Slide the Clutch Assembly onto the Hub (Item 1) and Key (Item 15) (See Figure 30).
7. Align the Spring Pin (Item 23) located on the Brake Assembly with the hole in the Clutch Assembly and press the Clutch Assembly onto the Hub (Item 1) (See Figure 30).
8. Slide the Compression Spring (Item 11) onto the Hub (Item 1); then, pressing on the inner bearing race, press the Sheave or Drive Disc Assembly onto the Hub (See Figure 31).
9. Reinstall the Retaining Ring (Item 37) and Hub Collar; then, reinstall the Set Screw (Item 47) (See Figure 32).

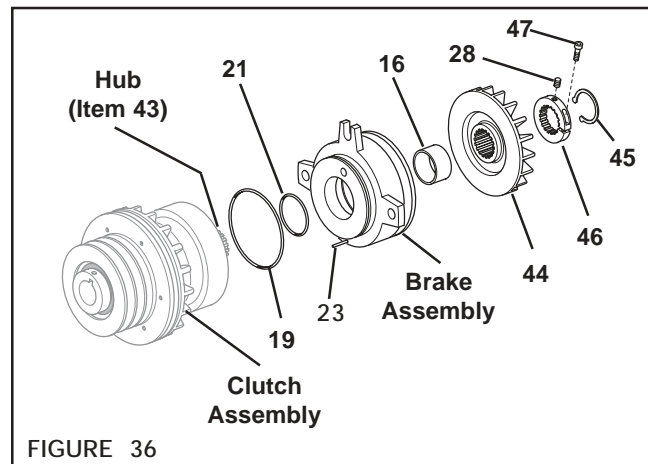
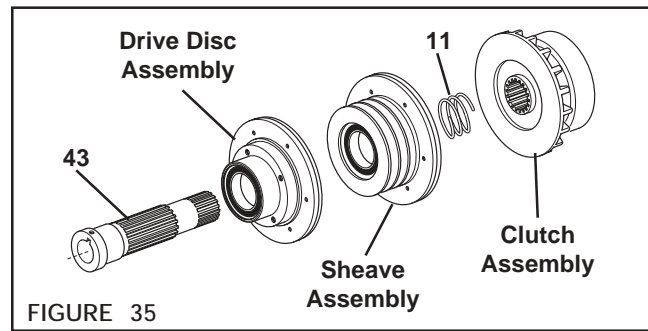


LWCB AND MWCB

1. Fully supporting the inner bearing race, press the Hub (Item 1) into the Sheave or Drive Disc Assembly (See Figure 33).
2. Slide the Compression Spring (Item 11) onto the Hub (Item 1); then, supporting the inner bearing race, press the Clutch Assembly onto the Hub (Item 1) (See Figure 33).
3. Lubricate the new O-ring Seals (Items 19 and 21) with fresh o-ring lubricant; then, install the new O-ring Seals onto the Brake and Clutch Assemblies (See Figure 34).
4. Align the Spring Pin (Item 23) located on the Brake Assembly with the hole in the Clutch Assembly and press the Brake Assembly onto the Hub (Item 1) (See Figure 34).
5. Slide the Spacer (Item 16) onto the Hub (Item 1); then, align the three holes in the Brake Friction Disc (Item 2) with the three holes in the Hub and slide the Brake Friction Disc (Item 2) onto the Hub (See Figure 34).
6. Reinstall the Locking Nut (Item 26) and tighten the Set Screws (Item 29) to 20 In. Lbs. [2.2 N•m] torque for the LWCB and 35 In. Lbs. [3.9 N•m] torque for the MWCB (See Figure 34).



1. Fully supporting the inner bearing race, press the Hub (Item 43) into the Sheave of Drive Disc Assembly (See Figure 35).
2. Slide the Compression Spring (Item 11) onto the Hub (Item 43); then, supporting the inner bearing race, press the Clutch Assembly onto the Hub (Item 43) (See Figure 35).
3. Lubricate the new O-ring Seals (Items 19 and 21) with fresh o-ring lubricant; then, install the new O-rings Seals onto the Brake and Clutch Assemblies (See Figure 36).
4. Align the Slotted Spring Pin (Item 23) located on the Brake Assembly with the hole in the Clutch Assembly and press the Brake Assembly onto the Hub (Item 43) (See Figure 36).
5. Slide the Spacer (Item 16) onto the Hub (Item 43); then, slide the Brake Friction Disc (Item 44) onto the Hub (See Figure 36).
6. Align the two holes in the Locking Collar (Item 46) with the two holes in the Hub (Item 43); then, reinstall the Locking Collar and tighten the Socket Head Cap Screw (Item 47) to 300 In. Lbs. [33.6 N·m] torque (See Figure 36).



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

FWCB-SHEAVE MOUNT

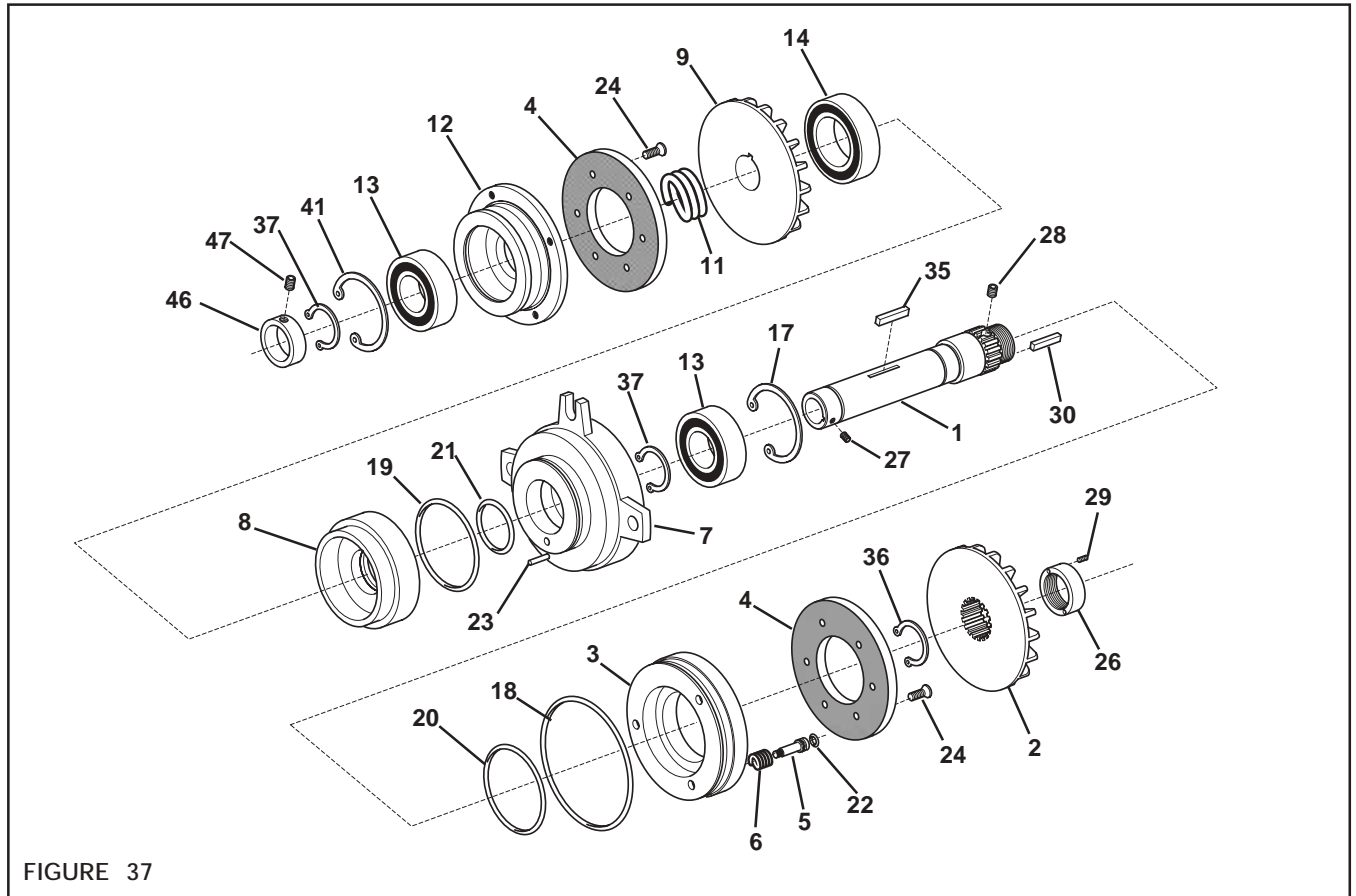


FIGURE 37

ITEM	DESCRIPTION	QTY
1	Hub	1
2	Friction Disc	1
3	Piston	1
4 ¹	Friction Facing	2
5 ¹	Shoulder Bolt	3
6 ¹	Compression Spring	3
7	Piston Air Chamber	1
8	Air Chamber	1
9	Friction Disc	1
11 ¹	Compression Spring	1
12	Sheave	1
13 ¹	Ball Bearing	2
14 ¹	Ball Bearing	1
17 ¹	Retaining Ring (Int.)	1
18 ¹	O-ring Seal	1
19 ¹	O-ring Seal	1
20 ¹	O-ring Seal	1

ITEM	DESCRIPTION	QTY
21 ¹	O-ring Seal	1
22 ¹	O-ring Seal	3
23 ¹	Slotted Spring Pin	1
24 ¹	Flat Head Machine Screw	12
26	Locking Nut	1
27	Set Screw	1
28	Set Screw	3
29	Set Screw	2
30	Key	2
32	Air Line (Not Shown)	2
35 ¹	Key	1
36 ¹	Retaining Ring (Ext.)	1
37 ¹	Retaining Ring (Ext.)	2
41	Retaining Ring (Int.)	1
46	Hub Collar	1
47	Set Screw	2

¹ Denotes Repair Kit item.
Repair Kit Product No. 847800.

NOTE
Repair Kit Product No. 847800 includes only one Ball Bearing (Item 13).

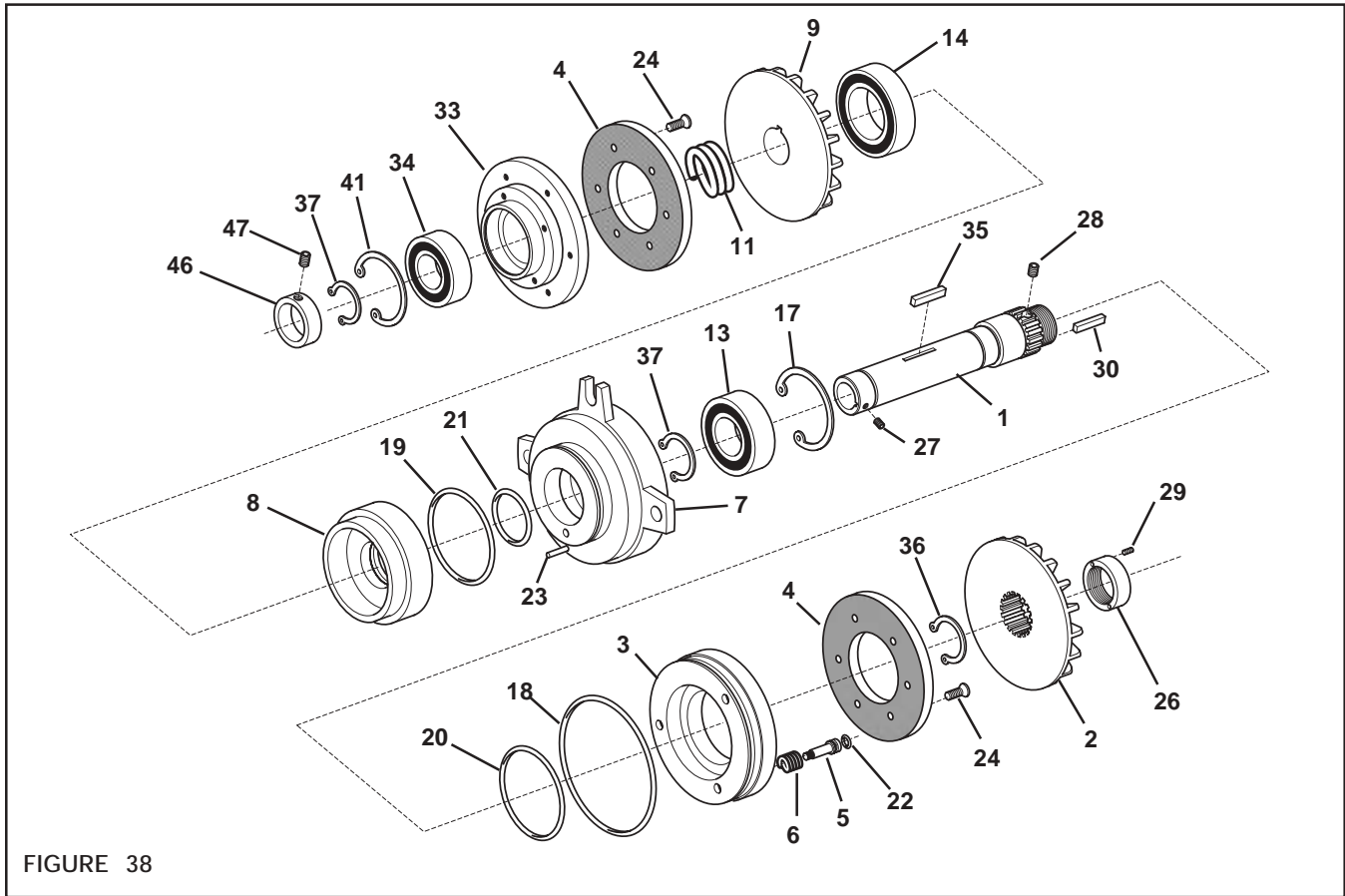


FIGURE 38

ITEM	DESCRIPTION	QTY
1	Hub	1
2	Friction Disc	1
3	Piston	1
4 ¹	Friction Facing	2
5 ¹	Shoulder Bolt	3
6 ¹	Compression Spring	3
7	Piston Air Chamber	1
8	Air Chamber	1
9	Friction Disc	1
11 ¹	Compression Spring	1
13 ¹	Ball Bearing	1
14 ¹	Ball Bearing	1
17 ¹	Retaining Ring (Int.)	1
18 ¹	O-ring Seal	1
19 ¹	O-ring Seal	1
20 ¹	O-ring Seal	1
21 ¹	O-ring Seal	1

ITEM	DESCRIPTION	QTY
22 ¹	O-ring Seal	3
23 ¹	Slotted Spring Pin	1
24 ¹	Flat Head Machine Screw	12
26	Locking Nut	1
27	Set Screw	1
28	Set Screw	3
29	Set Screw	2
30	Key	2
32	Air Line (Not Shown)	2
33	Pilot Drive Disc	1
34	Ball Bearing	1
35 ¹	Key	1
36 ¹	Retaining Ring (Ext.)	1
37 ¹	Retaining Ring (Ext.)	2
41	Retaining Ring (Int.)	1
46	Hub Collar	1
47	Set Screw	2

¹ Denotes Repair Kit item.
 Repair Kit Product No. 847800.

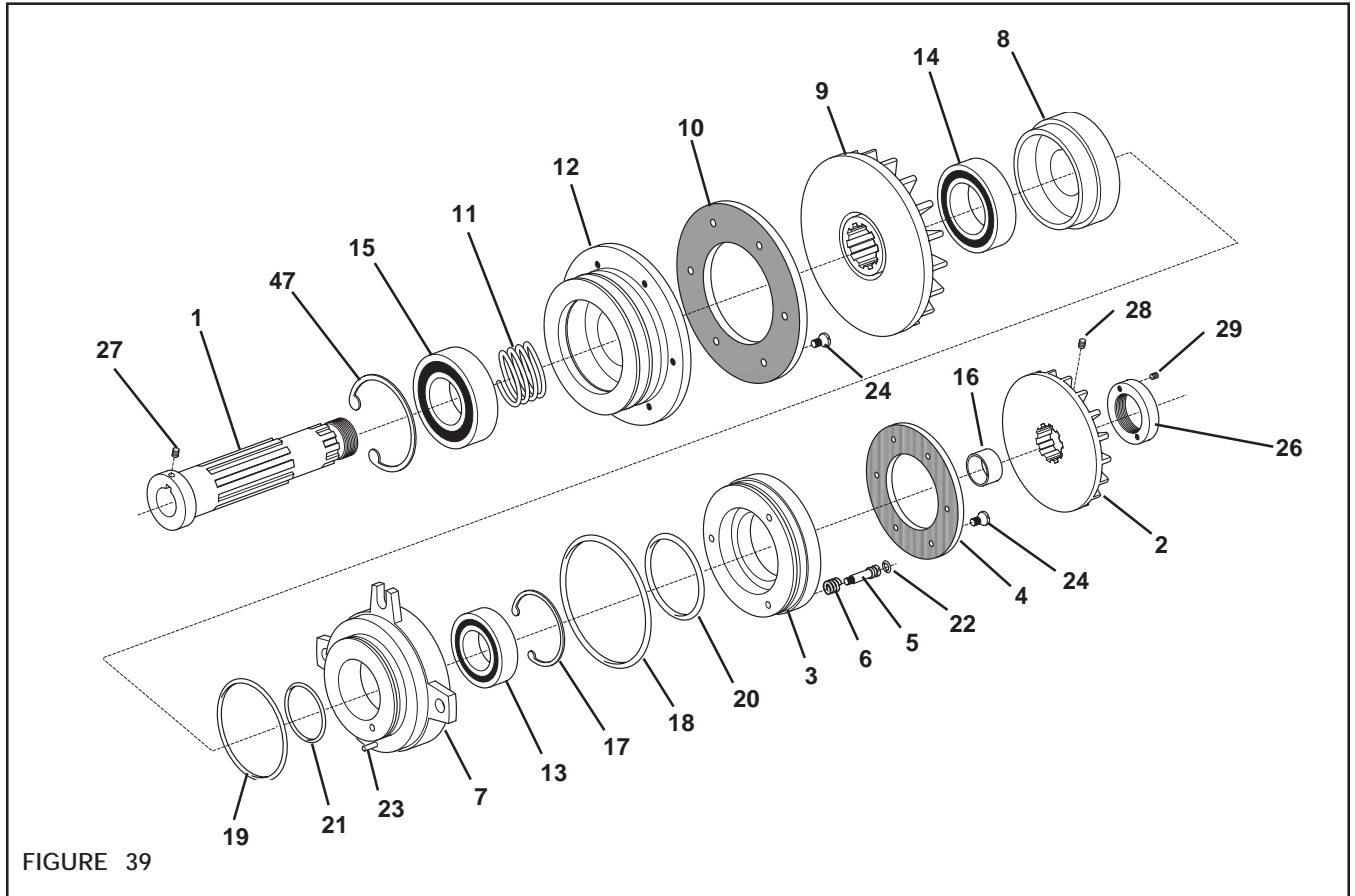
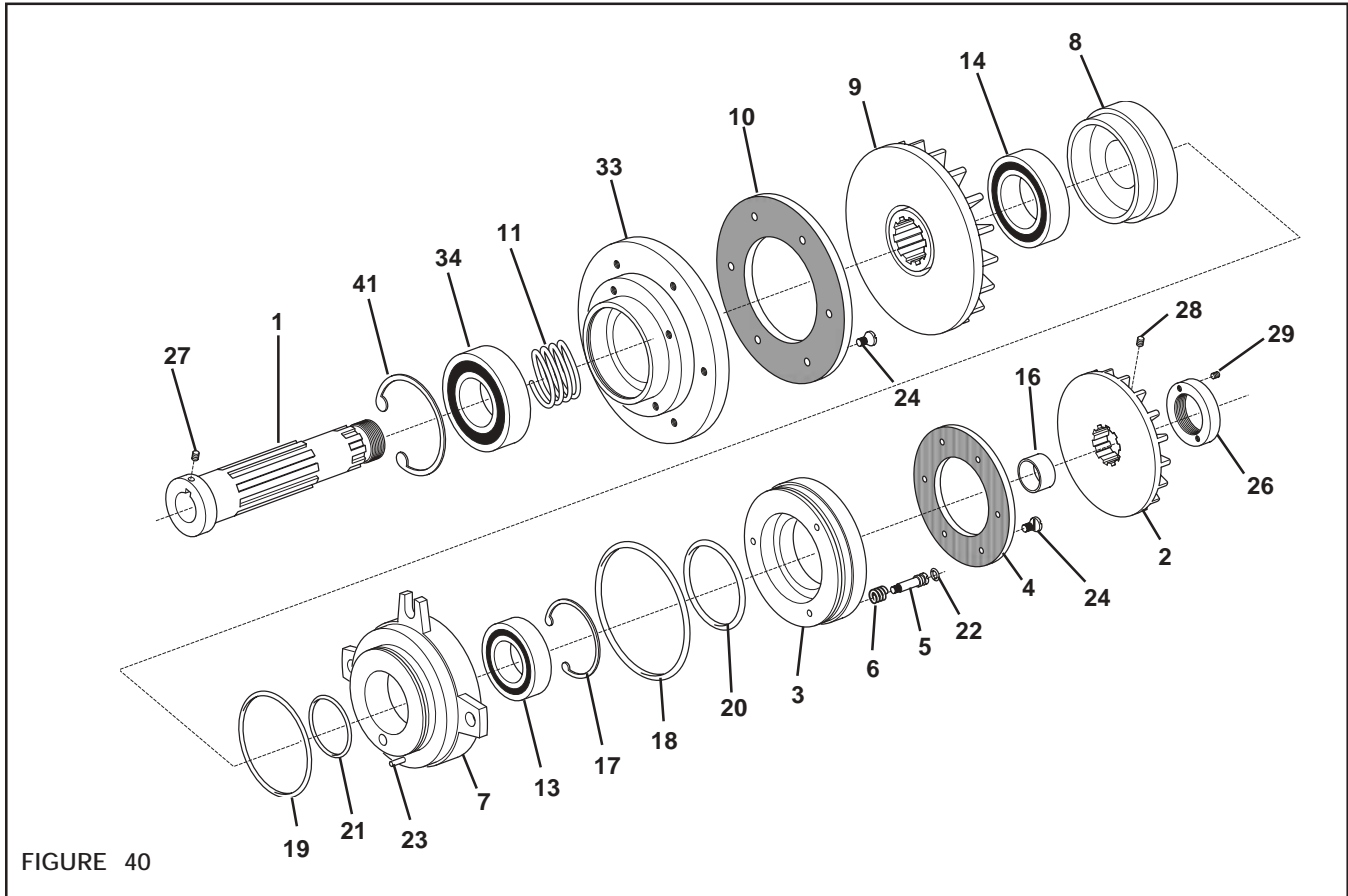


FIGURE 39

ITEM	DESCRIPTION	QTY
1	Hub	1
2	Friction Disc	1
3	Piston	1
4 ¹	Friction Facing	1
5 ¹	Shoulder Bolt	3
6 ¹	Compression Spring	3
7	Piston Air Chamber	1
8	Air Chamber	1
9	Friction Disc	1
10 ¹	Friction Facing	1
11 ¹	Compression Spring	1
12	Sheave	1
13 ¹	Ball Bearing	1
14 ¹	Ball Bearing	1
15	Ball Bearing	1
16	Spacer	1

ITEM	DESCRIPTION	QTY
17 ¹	Retaining Ring (Int.)	1
18 ¹	O-ring Seal	1
19 ¹	O-ring Seal	1
20 ¹	O-ring Seal	1
21 ¹	O-ring Seal	1
22 ¹	O-ring Seal	3
23 ¹	Slotted Spring Pin	1
24 ¹	Flat Head Machine Screw	12
26	Locking Nut	1
27	Set Screw	2
28	Set Screw	3
29	Set Screw	2
30	Key (Not Shown)	2
32	Air Line (Not Shown)	2
41	Retaining Ring (Int.)	1

¹ Denotes Repair Kit item.
 Repair Kit Product No. 847900.



ITEM	DESCRIPTION	QTY
1	Hub	1
2	Friction Disc	1
3	Piston	1
4 ¹	Friction Facing	1
5 ¹	Shoulder Bolt	3
6 ¹	Compression Spring	3
7	Piston Air Chamber	1
8	Air Chamber	1
9	Friction Disc	1
10 ¹	Friction Facing	1
11 ¹	Compression Spring	1
13 ¹	Ball Bearing	1
14 ¹	Ball Bearing	1
16	Spacer	1
17 ¹	Retaining Ring (Int.)	1
18 ¹	O-ring Seal	1

ITEM	DESCRIPTION	QTY
19 ¹	O-ring Seal	1
20 ¹	O-ring Seal	1
21 ¹	O-ring Seal	1
22 ¹	O-ring Seal	3
23 ¹	Slotted Spring Pin	1
24 ¹	Flat Head Machine Screw	12
26	Locking Nut	1
27	Set Screw	2
28	Set Screw	3
29	Set Screw	2
30	Key (Not Shown)	2
32	Air Line (Not Shown)	2
33	Pilot Drive Disc	1
34	Ball Bearing	1
41	Retaining Ring (Int.)	1

¹ Denotes Repair Kit item.
 Repair Kit Product No. 847900.

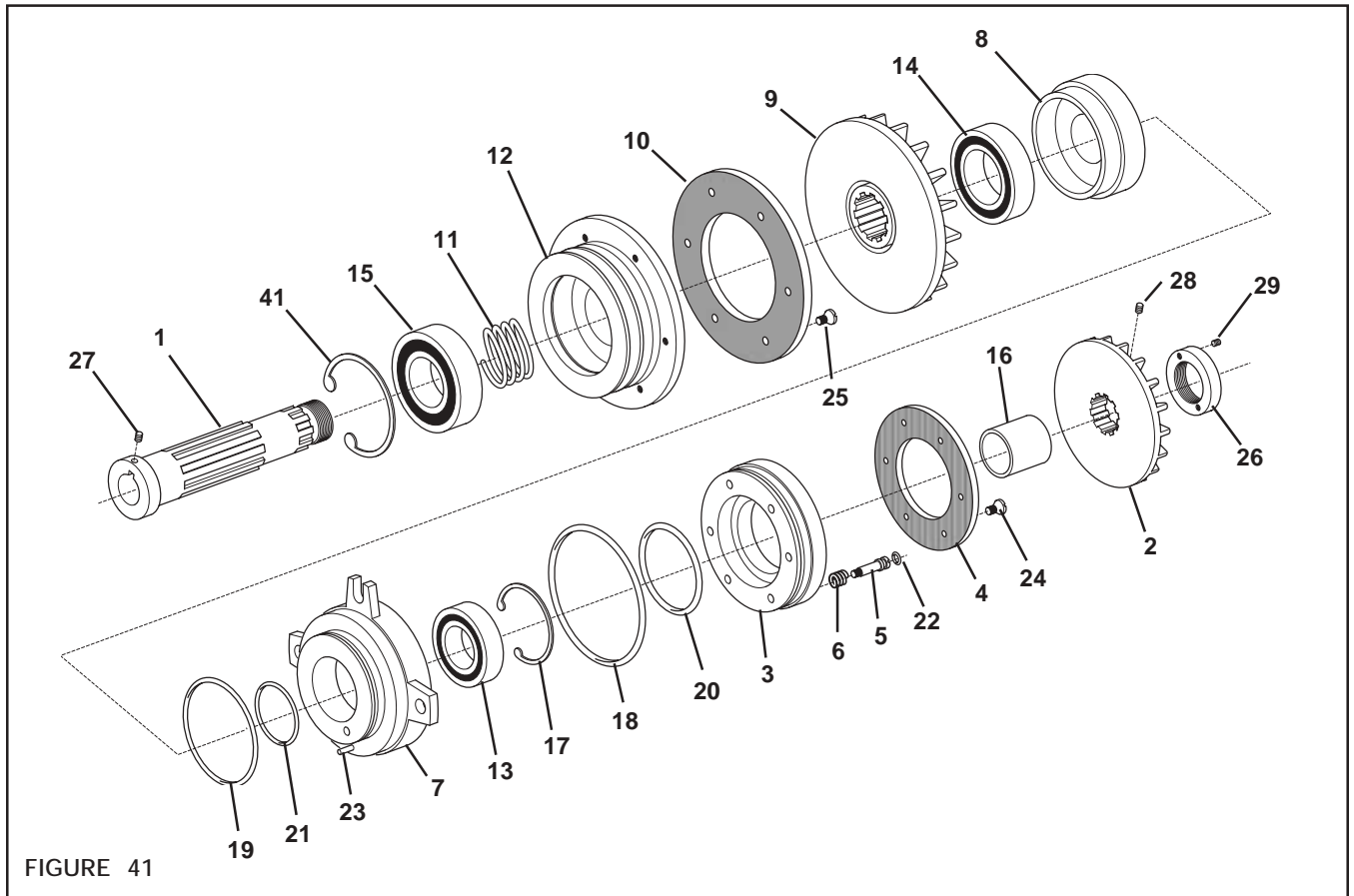


FIGURE 41

ITEM	DESCRIPTION	QTY
1	Hub	1
2	Friction Disc	1
3	Piston	1
4 ¹	Friction Facing	1
5 ¹	Shoulder Bolt	6
6 ¹	Compression Spring	6
7	Piston Air Chamber	1
8	Air Chamber	1
9	Friction Disc	1
10 ¹	Friction Facing	1
11 ¹	Compression Spring	1
12	Sheave	1
13 ¹	Ball Bearing	1
14 ¹	Ball Bearing	1
15	Ball Bearing	1
16	Spacer	1

ITEM	DESCRIPTION	QTY
17 ¹	Retaining Ring (Int.)	1
18 ¹	O-ring Seal	1
19 ¹	O-ring Seal	1
20 ¹	O-ring Seal	1
21 ¹	O-ring Seal	1
22 ¹	O-ring Seal	6
23 ¹	Slotted Spring Pin	1
24 ¹	Flat Head Machine Screw	6
25 ¹	Flat Head Machine Screw	6
26	Locking Nut	1
27	Set Screw	2
28	Set Screw	3
29	Set Screw	2
30	Key (Not Shown)	2
32	Air Line (Not Shown)	2
41	Retaining Ring (Int.)	1

¹ Denotes Repair Kit item.
 Repair Kit Product No. 848000.

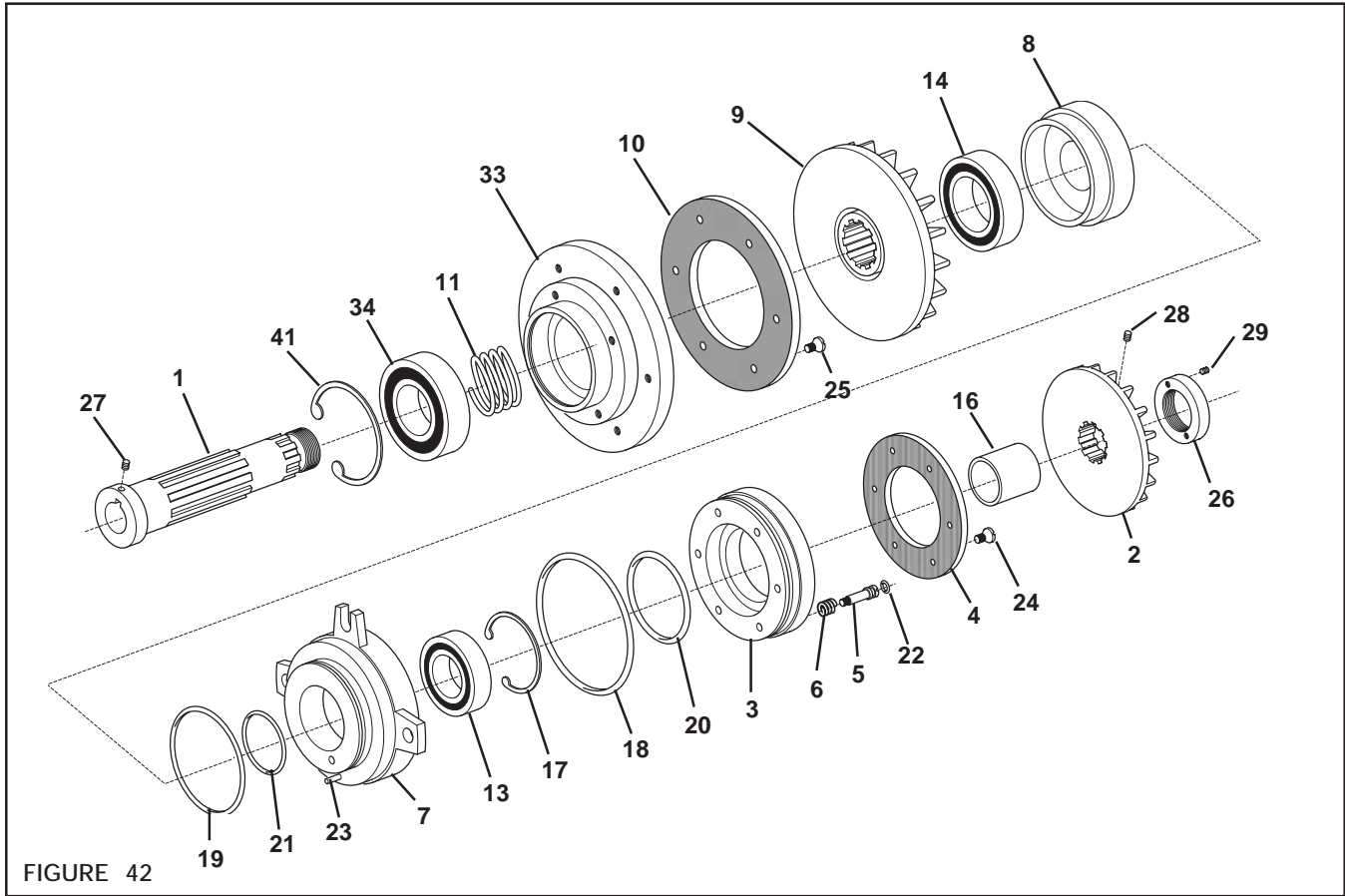


FIGURE 42

ITEM	DESCRIPTION	QTY
1	Hub	1
2	Friction Disc	1
3	Piston	1
4 ¹	Friction Facing	1
5 ¹	Shoulder Bolt	6
6 ¹	Compression Spring	6
7	Piston Air Chamber	1
8	Air Chamber	1
9	Friction Disc	1
10 ¹	Friction Facing	1
11 ¹	Compression Spring	1
13 ¹	Ball Bearing	1
14 ¹	Ball Bearing	1
16	Spacer	1
17 ¹	Retaining Ring (Int.)	1
18 ¹	O-ring Seal	1

ITEM	DESCRIPTION	QTY
19 ¹	O-ring Seal	1
20 ¹	O-ring Seal	1
21 ¹	O-ring Seal	1
22 ¹	O-ring Seal	6
23 ¹	Slotted Spring Pin	1
24 ¹	Flat Head Machine Screw	6
25 ¹	Flat Head Machine Screw	6
26	Locking Nut	1
27	Set Screw	2
28	Set Screw	3
29	Set Screw	2
30	Key (Not Shown)	2
32	Air Line (Not Shown)	2
33	Pilot Drive Disc	1
34	Ball Bearing	1
41	Retaining Ring (Int.)	1

¹ Denotes Repair Kit item.
 Repair Kit Product No. 848000.

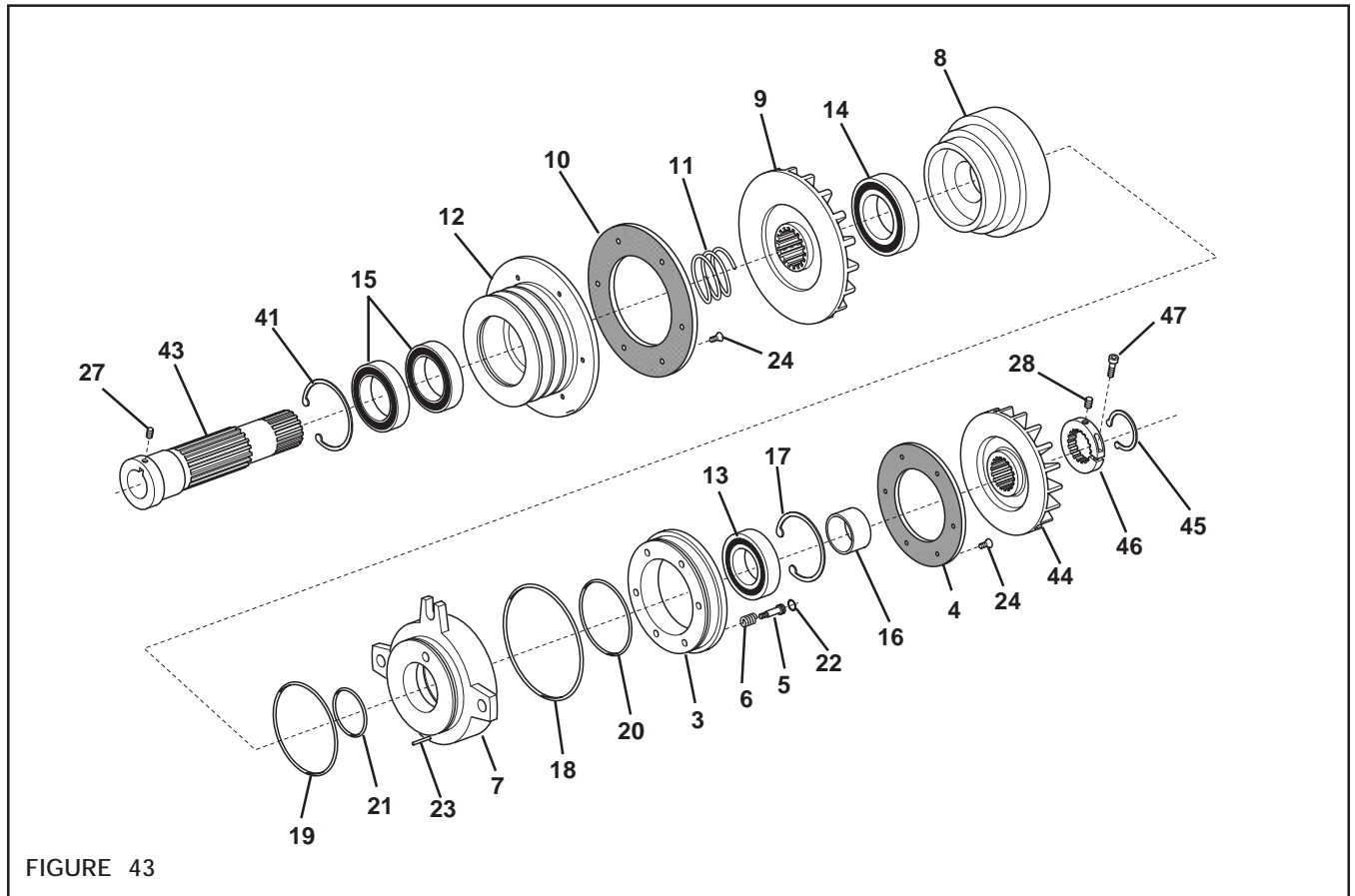


FIGURE 43

ITEM	DESCRIPTION	QTY
3	Piston	1
4 ¹	Friction Facing	1
5 ¹	Shoulder Bolt	6
6 ¹	Compression Spring	6
7	Piston Air Chamber	1
8	Air Chamber	1
9	Friction Disc	1
10 ¹	Friction Facing	1
11 ¹	Compression Spring	1
12	Sheave	1
13 ¹	Ball Bearing	1
14 ¹	Ball Bearing	1
15	Ball Bearing	2
16	Spacer	1
17 ¹	Retaining Ring (Int.)	1
18 ¹	O-ring Seal	1

ITEM	DESCRIPTION	QTY
19 ¹	O-ring Seal	1
20 ¹	O-ring Seal	1
21 ¹	O-ring Seal	1
22 ¹	O-ring Seal	6
23 ¹	Slotted Spring Pin	1
24 ¹	Flat Head Machine Screw	12
27	Set Screw	2
28	Set Screw	2
30	Key (Not Shown)	2
32	Air Line (Not Shown)	2
41	Retaining Ring (Int.)	1
43	Hub	1
44	Friction Disc	1
45 ¹	Retaining Ring (Ext.)	1
46	Locking Collar	1
47	Socket Head Cap Screw	1

¹ Denotes Repair Kit item.
 Repair Kit Product No. 848100.

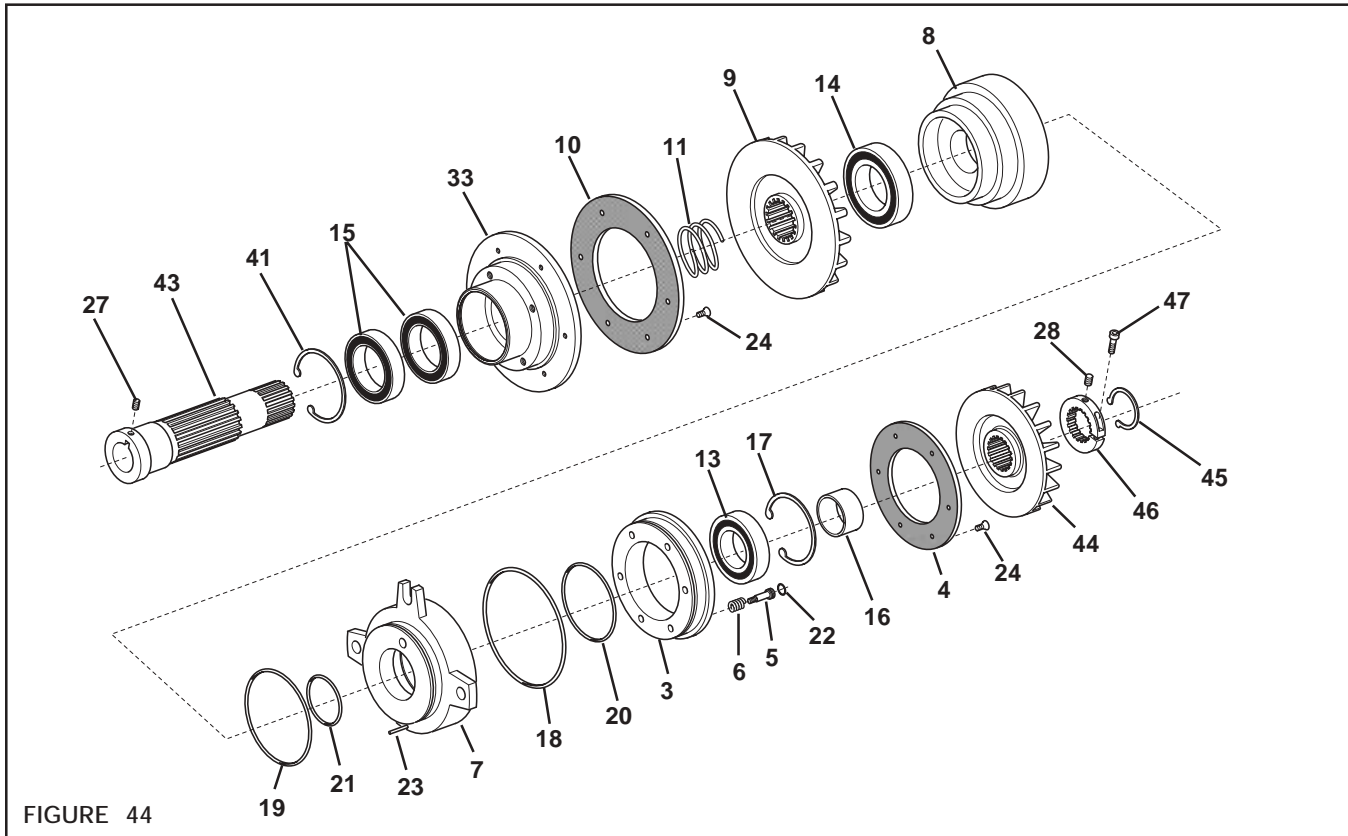


FIGURE 44

ITEM	DESCRIPTION	QTY
3	Piston	1
4 ¹	Friction Facing	1
5 ¹	Shoulder Bolt	6
6 ¹	Compression Spring	6
7	Piston Air Chamber	1
8	Air Chamber	1
9	Friction Disc	1
10 ¹	Friction Facing	1
11 ¹	Compression Spring	1
13 ¹	Ball Bearing	1
14 ¹	Ball Bearing	1
15	Ball Bearing	2
16	Spacer	1
17 ¹	Retaining Ring (Int.)	1
18 ¹	O-ring Seal	1
19 ¹	O-ring Seal	1

ITEM	DESCRIPTION	QTY
20 ¹	O-ring Seal	1
21 ¹	O-ring Seal	1
22 ¹	O-ring Seal	6
23 ¹	Slotted Spring Pin	1
24 ¹	Flat Head Machine Screw	12
27	Set Screw	2
28	Set Screw	2
30	Key (Not Shown)	2
32	Air Line (Not Shown)	2
33	Pilot Drive Disc	1
41	Retaining Ring (Int.)	1
43	Hub	1
44	Friction Disc	1
45 ¹	Retaining Ring (Ext.)	1
46	Locking Collar	1
47	Socket Head Cap Screw	1

¹ Denotes Repair Kit item. Repair Kit Product No. 848100.

COUPLING

ITEM	DESCRIPTION	QTY
24	Adapter Plate	1
25	Flexible Ring	1
26	Coupling Hub	1
33	Cap Screw	4
34	Lock Washer	4

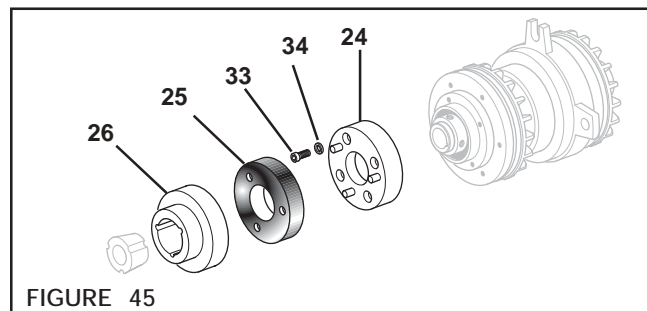


FIGURE 45



Warranties

Nexen warrants that the Products will be free from any defects in material or workmanship for a period of 12 months from the date of shipment. NEXEN MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, AND ALL IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. This warranty applies only if (a) the Product has been installed, used and maintained in accordance with any applicable Nexen installation or maintenance manual for the Product; (b) the alleged defect is not attributable to normal wear and tear; (c) the Product has not been altered, misused or used for purposes other than those for which it was intended; and (d) Buyer has given written notice of the alleged defect to Nexen, and delivered the allegedly defective Product to Nexen, within one year of the date of shipment.

Exclusive Remedy

The exclusive remedy of the Buyer for any breach of the warranties set out above will be, at the sole discretion of Nexen, a repair or replacement with new, serviceably used or reconditioned Product, or issuance of credit in the amount of the purchase price paid to Nexen by the Buyer for the Products.

Limitation of Nexen's Liability

TO THE EXTENT PERMITTED BY LAW NEXEN SHALL HAVE NO LIABILITY TO BUYER OR ANY OTHER PERSON FOR INCIDENTAL DAMAGES, SPECIAL DAMAGES, CONSEQUENTIAL DAMAGES OR OTHER DAMAGES OF ANY KIND OR NATURE WHATSOEVER, WHETHER ARISING OUT OF BREACH OF WARRANTY OR OTHER BREACH OF CONTRACT, NEGLIGENCE OR OTHER TORT, OR OTHERWISE, EVEN IF NEXEN SHALL HAVE BEEN ADVISED OF THE POSSIBILITY OR LIKELIHOOD OF SUCH POTENTIAL LOSS OR DAMAGE. For all of the purposes hereof, the term "consequential damages" shall include lost profits, penalties, delay images, liquidated damages or other damages and liabilities which Buyer shall be obligated to pay or which Buyer may incur based upon, related to or arising out of its contracts with its customers or other third parties. In no event shall Nexen be liable for any amount of damages in excess of amounts paid by Buyer for Products or services as to which a breach of contract has been determined to exist. The parties expressly agree that the price for the Products and the services was determined in consideration of the limitation on damages set forth herein and such limitation has been specifically bargained for and constitutes an agreed allocation of risk which shall survive the determination of any court of competent jurisdiction that any remedy herein fails of its essential purpose.

Limitation of Damages

In no event shall Nexen be liable for any consequential, indirect, incidental, or special damages of any nature whatsoever, including without limitation, lost profits arising from the sale or use of the Products.

Warranty Claim Procedures

To make a claim under this warranty, the claimant must give written notice of the alleged defect to whom the Product was purchased from and deliver the Product to same within one year of the date on which the alleged defect first became apparent.

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