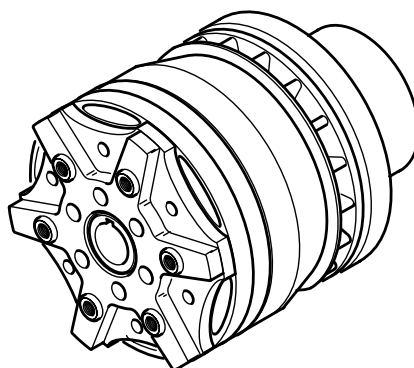




*formerly Horton Industrial Products*

**“Web Controls”**

**TENSION CONTROL CLUTCH  
MODELS STC600 AND STC940  
INSTALLATION, OPERATION, AND MAINTENANCE INSTRUCTIONS**



Read this manual carefully, making full use of its explanations and instructions. The “Know How” of safe, continuous, trouble-free operation depends on the degree of your understanding of the system and your willingness to keep all components in proper operating condition. Pay particular attention to all **NOTES, CAUTIONS, and WARNINGS** to avoid the risk of personal injury or property damage. It is important to understand that these **NOTES, CAUTIONS, and WARNINGS** are not exhaustive. Nexen cannot possibly know or evaluate all conceivable methods in which service may be performed, or the possible hazardous consequences of each method. Accordingly, anyone who uses a procedure that is not recommended by Nexen must first satisfy themselves that neither their safety or the safety of the product will be jeopardized by the service method selected.

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## INSTALLATION

1. Install the customer supplied sheave onto the Pilot Mount Drive Disc of the STC (See Figure 1).
2. Insert the Nexen supplied Key (Item 30) into the shaft and slide the STC onto the shaft (See Figure 1).
3. Install and tighten the two Nexen supplied Set Screws (Item 29) (See Figure 1).

**NOTE**

Two 3/8-16 tapped holes at 180° are provided in the Piston Guide for securing the STC to the machine frame (See Figure 1).

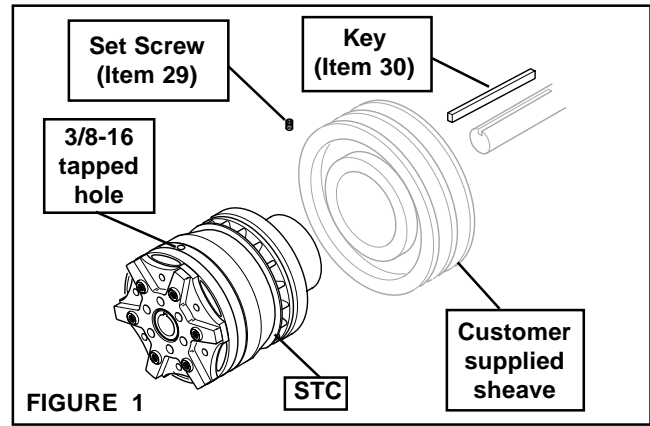


FIGURE 1

## AIR LINE CONNECTIONS

Nexen STCs have six air ports. All six air ports accept 1/8" NPT fittings. Air line connections to the STC can be made in two ways.

The first method requires three air sources and allows the operator to interrupt or supply air to any combination of the three pairs of ports. The three pairs of ports supply pressure to three different sized pistons. Each port is labeled "A," "B," or "C." The two "A" ports supply the smallest pistons. The two "B" ports supply the intermediate sized pistons. The two "C" ports supply the largest pistons. The torque output is related to a change in air pressure and the number and size of the pistons used (See Figure 2).

**NOTE**

Only pairs of pistons A, B, or C should be used. Do not use only one piston.

The second method is to plumb all six ports together so they are supplied by one source. This method relates the change in torque performance to change in air pressure (See Figure 3).

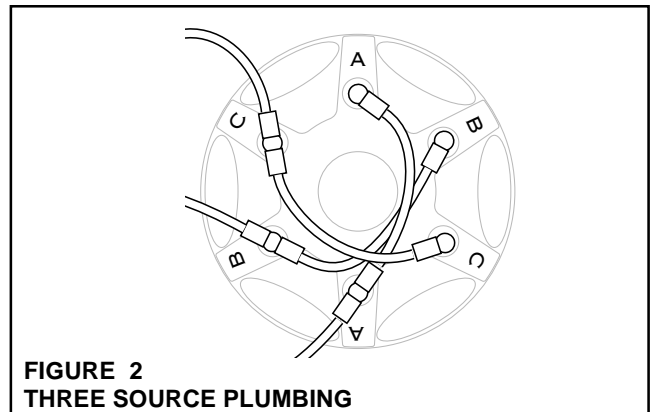


FIGURE 2  
 THREE SOURCE PLUMBING

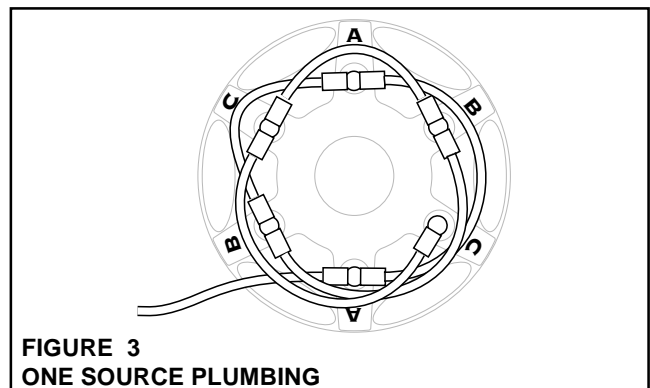
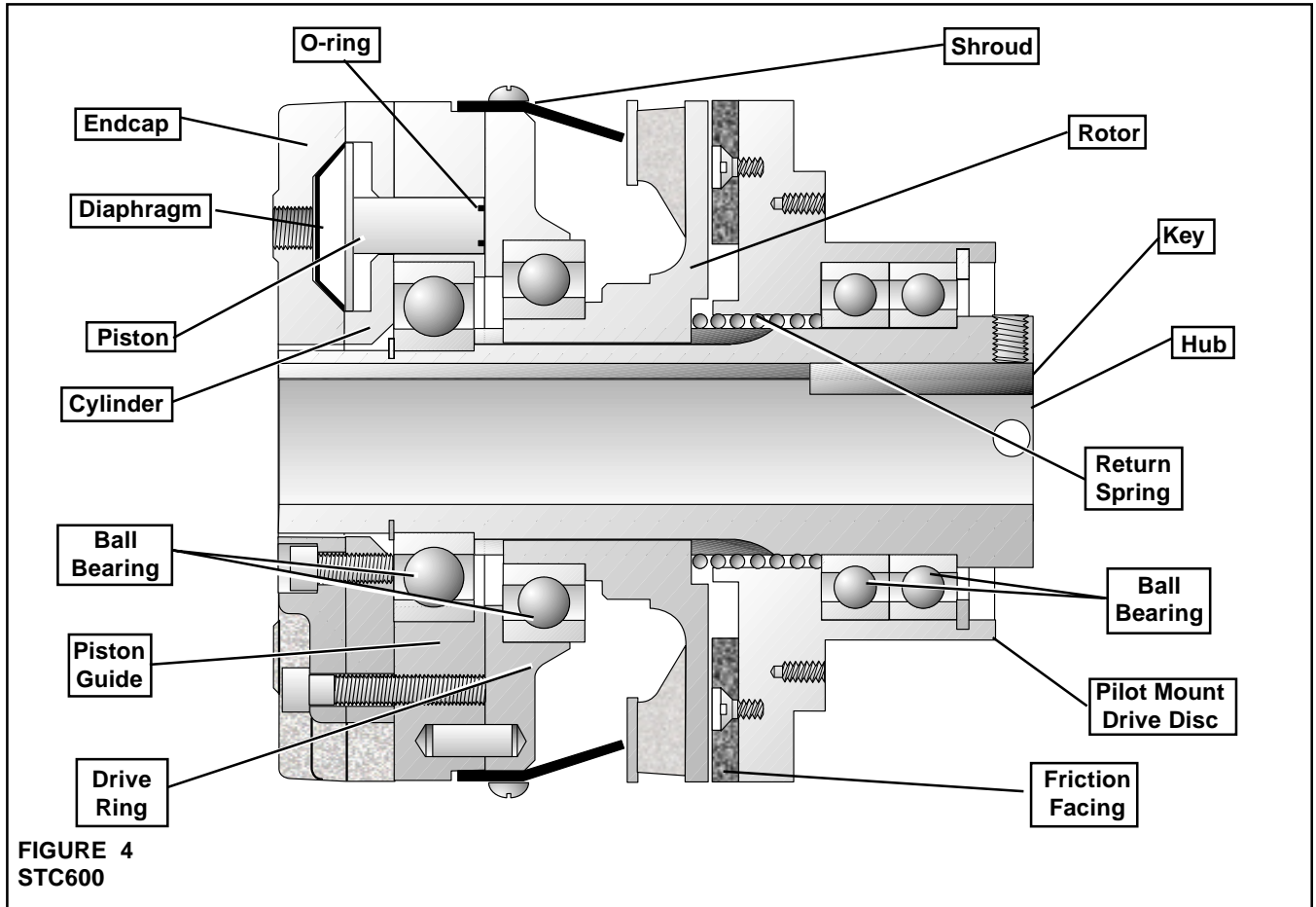


FIGURE 3  
 ONE SOURCE PLUMBING

## TROUBLESHOOTING

SYMPTOM	PROBABLE CAUSE	SOLUTION
Failure to engage.	Air not getting to the STC.	Check for a control valve malfunction or low air pressure.
Failure to disengage.	Unexhausted air.	Check for a control valve malfunction.
Friction Facing squeal or chatter.	Air pressure too high.	Reduce the air pressure.
	Wrong Friction Facings for the application.	Replace the Friction Facing with correct facing for the application.
Wobble or vibration.	Shaft misalignment.	Inspect the shaft and realign it if necessary.



# FRICION FACING REPLACEMENT

**NOTE**

This section is for **FRICION FACING REPLACEMENT** only. If a Repair Kit is to be used, refer to **PARTS REPLACEMENT**.

1. Remove the six Socket Head Cap Screws (Item 25) (See Figure 5).
2. Remove the Endcap (Item 3) and Cylinder (Item 1) (See Figure 5).

**WARNING**

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

3. Remove the Retaining Ring (Item 21) (See Figure 5).
4. Insert two customer supplied 3/8-16 UNC bolts into the anti-rotation holes located on the O.D. of the Piston Guide (Item 11) (See Figure 6).
5. Support the STC on the two bolts installed in Step 4; then, press the Piston Guide (Item 11) and Ball Bearing (Item 22) off the Hub (Item 5) (See Figure 6).
7. Slide the Drive Ring (Item 2), Rotor (Item 17), and Shroud (Item 15) off the Hub (Item 5) (See Figure 6).

**NOTE**

The Flat Head Machine Screws (Item 27) securing the Friction Facing (Item 4) on the STC are installed with a anaerobic thread locking compound. If removal is difficult, insert a properly fitting screwdriver into the head of the Flat Head Machine Screw; then, strike the end of the screwdriver with a hammer to break the crystalline structure of this compound and allow removal of the Flat Head Machine Screw. Never use an impact wrench to remove the Flat Head Machine Screws.

8. Remove the six Flat Head Machine Screws (Item 27) that secure the Friction Facing (Item 4) to the Pilot Mount Drive Disc (Item 6) (See Figure 7).
9. Remove the old Friction Facing (Item 4) (See Figure 7).
10. Using six new Flat Head Machine Screws (Item 27), secure the new Friction Facing (Item 4) to the Pilot Mount Drive Disc (Item 6) (See Figure 7).
11. Tighten the six Flat Head Machine Screws (Item 27) to the recommended torque (See Figure 7 and Table 1).
12. Slide the Drive Ring (Item 2), Rotor (Item 17), and Shroud (Item 15) onto the Hub (Item 5) (See Figure 6).
13. Press the Piston Guide (Item 11) and Ball Bearing (Item 22) onto the Hub (Item 5) (See Figure 6).

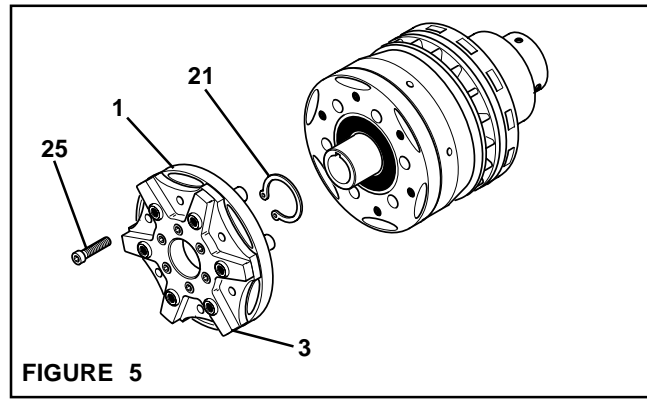


FIGURE 5

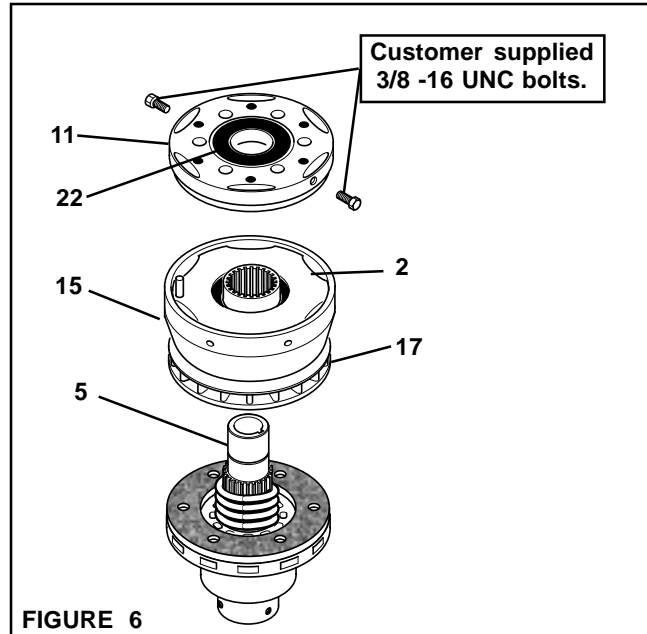


FIGURE 6

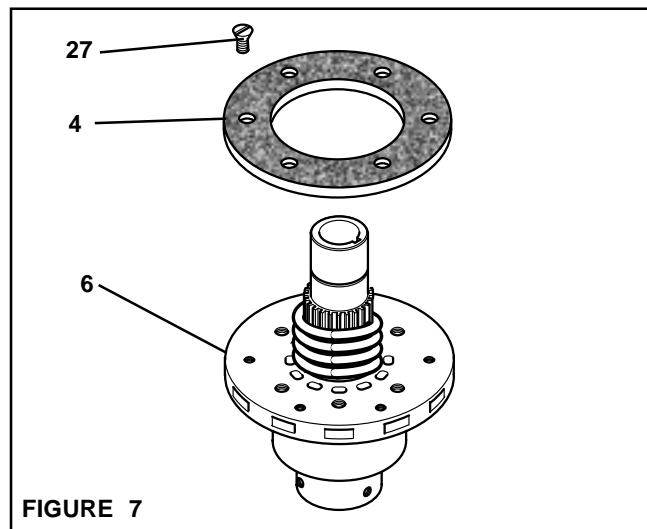


FIGURE 7

MODEL	RECOMMENDED TORQUE FLAT HEAD MACHINE SCREWS (ITEM 27)
STC600	26 In. Lbs. [2.9 N•m]
STC940	86 In. Lbs. [9.7 N•m]

TABLE 1

14. Remove the two customer supplied 3/8-16 UNC bolts from the anti-rotation holes located on the O.D. of the Piston Guide (Item 11) (See Figure 6).
15. Reinstall the Retaining Ring (Item 21) (See Figure 5).
16. Slide the Endcap (Item 3) and Cylinder (Item 1) onto the Hub (Item 5) (See Figure 5).
17. Apply a drop of Loctite® 242 to the threads of the six Socket Head Cap Screws (Item 25) and secure the Endcap (Item 3) and Cylinder (Item 1) to the Piston Guide (Item 11) (See Figure 5).

MODEL	RECOMMENDED TORQUE	
	SOCKET HEAD	CAP SCREWS (ITEM 25)
STC600	45 In. Lbs. [5.1 N•m]	
STC940	143 In. Lbs. [16.2 N•m]	

**TABLE 2**

**NOTE**

**Ensure the Pistons (Items 8, 9, and 10) do not bind between the Diaphragms (Items 12, 13, and 14) and Piston Guide (Item 11) when the Socket Head Cap Screws (Item 25) are tightened.**

18. Alternately and evenly tighten the six Socket Head Cap Screws (Item 25) to the recommended torque (See Figure 5 and Table 2).

## PARTS REPLACEMENT

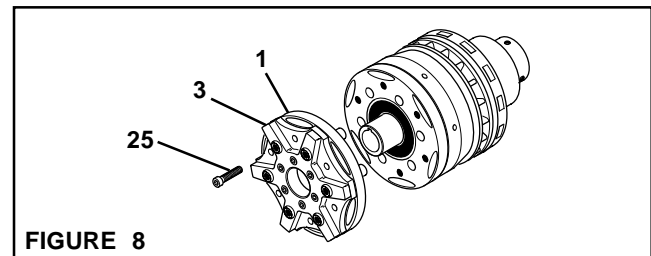
### DISASSEMBLY

**NOTE**

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

#### STC600 and STC940

1. Remove the six Socket Head Cap Screws (Item 25) (See Figure 8).
2. Remove the Endcap (Item 3) and Cylinder (Item 1) (See Figure 8).
3. Remove the six Socket Head Cap Screws (Item 26); then, separate the Cylinder (Item 1) from the Endcap (Item 3) (See Figure 8).

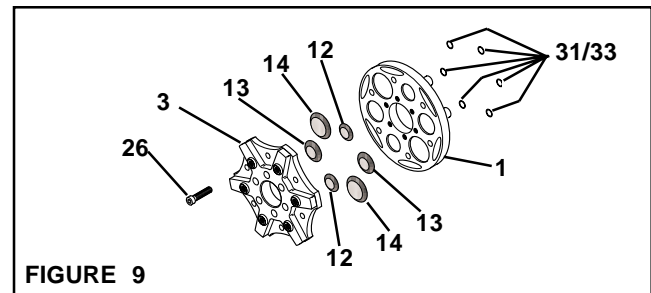


**FIGURE 8**

**NOTE**

**There are three sizes of Diaphragms (See Table 3). When replacing the six Diaphragms, make sure the correct size Diaphragm is used for each Diaphragm location (See Figure 9).**

4. Remove the six old Diaphragms (Items 12, 13, and 14) from the Endcap (Item 3) (See Figure 9).



**FIGURE 9**

**NOTE**

**On STC600, the O-rings are (Item 31). On STC940, the O-rings are (Item 33).**

5. Remove the six old O-rings (Item 31 or 33) from the ends of the Pistons (Items 8, 9, and 10) (See Figure 9).
6. Install the six new Diaphragms (Items 12, 13, and 14) into their respective locations in the Endcap (Item 3) (See Figure 9).
7. Match the Pistons (Items 8, 9, and 10) in the Cylinder (Item 1) with the Diaphragms (Items 12, 13, and 14) in the Endcap (Item 3) (See Figure 9).
8. Install six new O-rings (Item 31 or 33) onto the ends of the Pistons (Items 8, 9, and 10) (See Figure 9).
9. Apply a drop of Loctite® 242 to the threads of the six Socket Head Cap Screws (Item 26) and secure the Endcap (Item 3) to the Cylinder (Item 1) (See Figure 9).
10. Alternately and evenly tighten the six Socket Head Cap Screws (Item 26) to the recommended torque (See Table 3).

DIAPHRAGM O.D.	ITEM 12	ITEM 13	ITEM 14
STC600	1.25 In. [31.75 mm]	1.50 In. [38.10 mm]	1.75 In. [44.45 mm]
STC940	2.25 In. [57.15 mm]	2.50 In. [63.50 mm]	2.75 In. [69.85 mm]

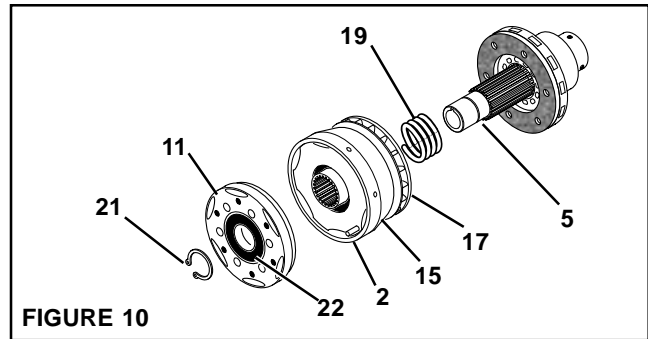
**TABLE 3**

MODEL	RECOMMENDED TORQUE SOCKET HEAD CAP SCREWS (ITEM 27)
STC600	26 In. Lbs. [2.9 N•m]
STC940	86 In. Lbs. [9.7 N•m]

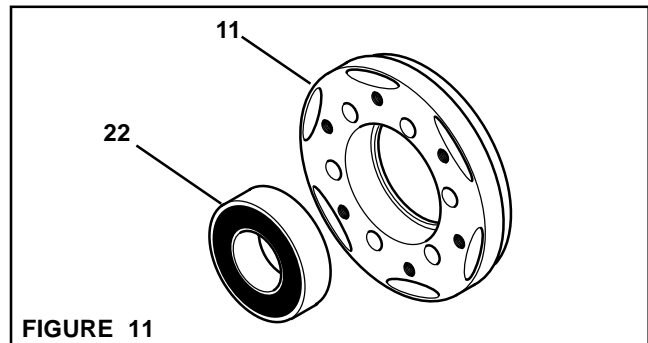
**TABLE 4**

**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.

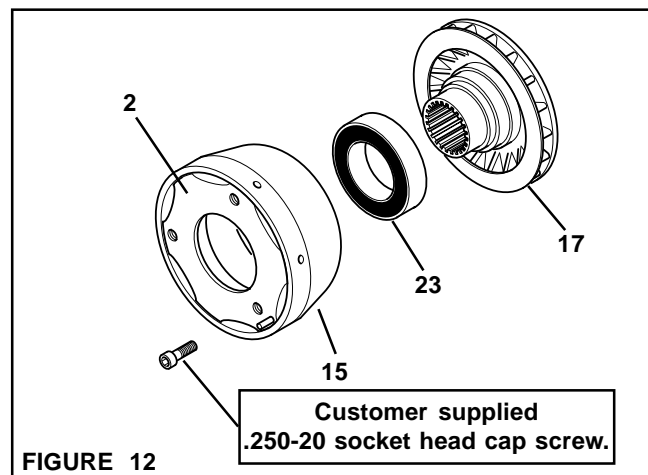
11. Remove the Retaining Ring (Item 21) (See Figure 10).
12. Press the Piston Guide (Item 11) and Ball Bearing (Item 22) off the Hub (Item 5) (See Figure 10).
13. Slide the Drive Ring (Item 2), Rotor (Item 17), and Shroud (Item 15) off the Hub (Item 5) (See Figure 10).
14. Slide the Return Spring (Item 19) off the Hub (Item 5) (See Figure 10).
15. Press the old Ball Bearing (Item 22) out of the Piston Guide (Item 11) (See Figure 11).
16. Clean the bearing bore of the Piston Guide (Item 11) with fresh safety solvent, making sure all old Loctite® residue is removed.
17. Apply an adequate amount of Loctite® 680 to evenly coat the outer race of the new Ball Bearing (Item 22).
18. Align the outer race of the new Ball Bearing (Item 22) with the bearing bore of the Piston Guide (Item 11); then, press the new Ball Bearing (Item 22) into place (See Figure 11).
19. Using customer supplied .250-20 socket head cap screws, thread three screws into tapped holes in Drive Ring (Item 2) (See Figure 12).
20. Alternately and evenly tighten three screws to press Drive Ring (Item 2) and shroud (Item 15) off Ball Bearing (Item 23) (See Figure 12).
21. Remove customer supplied screws when press is complete.
22. Pull the old Ball Bearing (Item 23) off the Rotor (Item 17) (See Figure 12).
23. Clean the bearing bore of the Drive Ring (Item 2) with fresh safety solvent, making sure all old Loctite® residue is removed.



**FIGURE 10**



**FIGURE 11**



**FIGURE 12**

24. Apply an adequate amount of Loctite® 680 to evenly coat the outer race of the new Ball Bearing (Item 23).
25. Align the outer race of the new Ball Bearing (Item 23) with the bearing bore of the Drive Ring (Item 2); then, press the new Ball Bearing (Item 23) into place (See Figure 12).

26. Press the Rotor (Item 17) into the Ball Bearing (Item 23) and Drive Ring (Item 2) (See Figure 12).

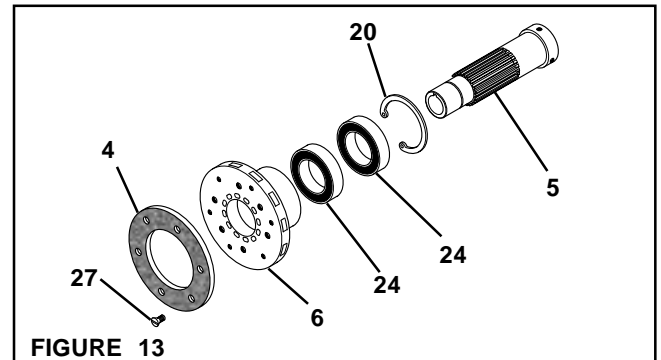
**NOTE**

**If you are replacing parts on the STC600, proceed with Step 1 for STC600. If you are replacing parts on the STC940, proceed with Step 1 for STC940.**

## PILOT BEARING AND FACING REPLACEMENT

### STC600

1. Press the Hub (Item 5) out of the two Ball Bearings (Item 24) and Pilot Mount Drive Disc (Item 6) (See Figure 13).
2. Remove the Retaining Ring (Item 20) from the Pilot Mount Drive Disc (Item 6) (See Figure 13).
3. Press the two old Ball Bearings (Item 24) out of the Pilot Mount Drive Disc (Item 6) (See Figure 13).
4. Clean the bearing bore of the Pilot Mount Drive Disc (Item 6) 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 Ball Bearings (Item 24).
6. Align the outer race of the first new Ball Bearing (Item 24) with the bearing bore of the Pilot Mount Drive Disc (Item 6); then, press the new Ball Bearing (Item 24) into place (See Figure 13).
7. Align the outer race of the second new Ball Bearing (Item 24) with the bearing bore of the Pilot Mount Drive Disc (Item 6); then, press the second new Ball Bearing (Item 24) into place (See Figure 13).
8. Install the Retaining Ring (Item 20) (See Figure 13).
9. Supporting the inner race of the two new Ball Bearings, press the Hub (Item 5) into the two new Ball Bearings (Item 24) and Pilot Mount Drive Disc (See Figure 13).



10. Remove the six old Flat Head Screws (Item 27) that secure the Friction Facing (Item 4) to the Pilot Mount Drive Disc (See Figure 13).
11. Remove the old Friction Facing (Item 4) (See Figure 13).
12. Using six new Flat Head Screws (Item 27), secure the new Friction Facing (Item 4) to the Pilot Mount Drive Disc (See Figure 13).
13. Tighten the six Flat Head Screws (Item 27) to 26 In. Lbs. [2.9 N•m] torque.

**NOTE**

**The Flat Head Machine Screws (Item 27) securing the Friction Facing (Item 4) on the STC are installed with an anaerobic thread locking compound. If removal is difficult, insert a properly fitting screwdriver into the head of the Flat Head Machine Screw; then, strike the end of the screwdriver with a hammer to break the crystalline structure of this compound and allow removal of the Flat Head Machine Screw. Never use an impact wrench to remove the Flat Head Machine Screws.**

STC940

**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 31) (See Figure 14).
2. Press the Hub (Item 5) out of the two Ball Bearings (Item 24), Spacer (Item 16), and Pilot Mount Drive Disc (Item 6) (See Figure 14).

**NOTE**

**Do not remove the Backing Plate (Item 39) from the Hub (Item 5) (See Figure 14).**

3. Remove the Retaining Ring (Item 20) (See Figure 14).
4. Press the two old Ball Bearings (Item 24) and Spacer (Item 16) out of the Pilot Mount Drive Disc (Item 6) (See Figure 14).
5. Clean the bearing bore of the Pilot Mount Drive Disc (Item 6) with fresh safety solvent, making sure all old Loctite® residue is removed.
6. Apply an adequate amount of Loctite® to evenly coat the outer race of the two new Ball Bearings (Item 24).
7. Align the outer race of the first new Ball Bearing (Item 24) with the bearing bore of the Pilot Mount Drive Disc (Item 6); then, press the first new Ball Bearing (Item 24) into place (See Figure 14).
8. Reinstall the Spacer (Item 16) (See Figure 14).
9. Align the outer race of the second new Ball Bearing (Item 24) with the bearing bore of the Pilot Mount Drive Disc (Item 6); then, supporting the inner race, press the second new Ball Bearing (Item 24) into place (See Figure 14).
10. Reinstall the Retaining Ring (Item 20) (See Figure 14).
11. Supporting the inner race of the second new Ball Bearing, press the Hub (Item 5) into the two new Ball Bearings (Item 24), Spacer (Item 16), and Pilot Mount Drive Disc (See Figure 14).
12. Reinstall the Retaining Ring (Item 31) (See Figure 14).

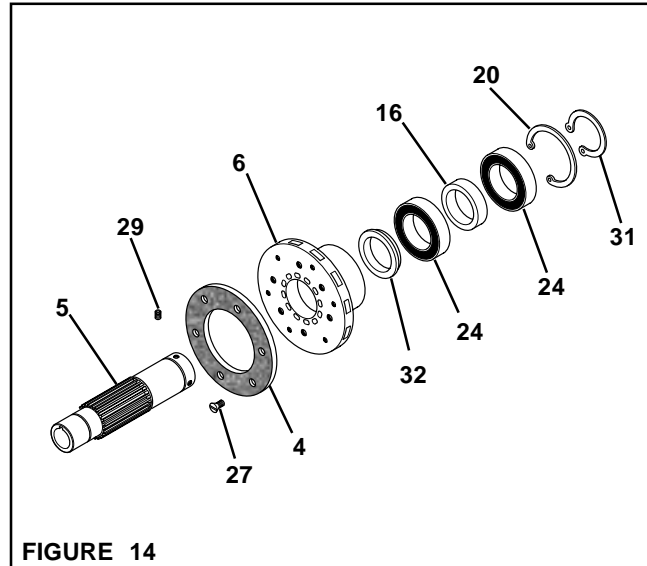


FIGURE 14

**NOTE**

**The Flat Head Machine Screws (Item 27) securing the Friction Facing (Item 4) on the STC are installed with a anaerobic thread locking compound. If removal is difficult, insert a properly fitting screwdriver into the head of the Flat Head Machine Screw; then, strike the end of the screwdriver with a hammer to break the crystalline structure of this compound and allow removal of the Flat Head Machine Screw. Never use an impact wrench to remove the Flat Head Machine Screws.**

13. Remove the six old Flat Head Screws (Item 27) that secure the Friction Facing (Item 4) to the Pilot Mount Drive Disc (See Figure 14).
14. Remove the old Friction Facing (Item 4) (See Figure 14).
15. Using six new Flat Head Screws (Item 27), secure the new Friction Facing (Item 4) to the Pilot Mount Drive Disc (See Figure 14).
16. Tighten the six Flat Head Screws (Item 27) to 86 In. Lbs. [9.7 N•m] torque.



## REASSEMBLY

### STC600 and STC940

- Slide the Return Spring (Item 19) onto the Hub (Item 5) (See Figure 15).
- Slide the Drive Ring (Item 2), Rotor (Item 17), and Shroud (Item 15) onto the Hub (Item 5) (See Figure 15).

**NOTE**

**The Dowel Pin (Item 7) must be aligned with the hole in the Piston Guide (Item 11) (See Figure 15).**

- Press the Ball Bearing (Item 22) and the Piston Guide (Item 11) onto the Hub (Item 5) (See Figure 15).

**WARNING**

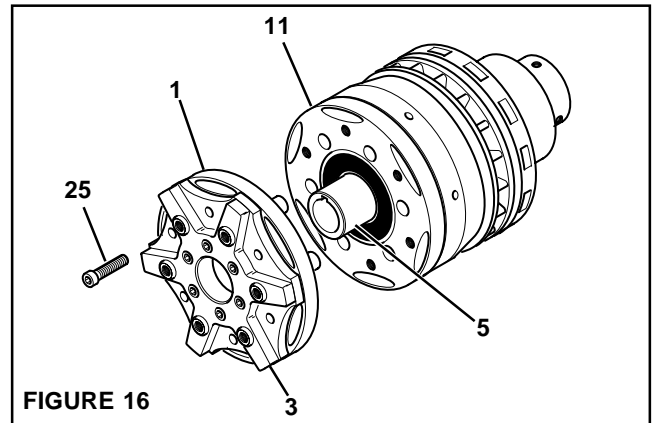
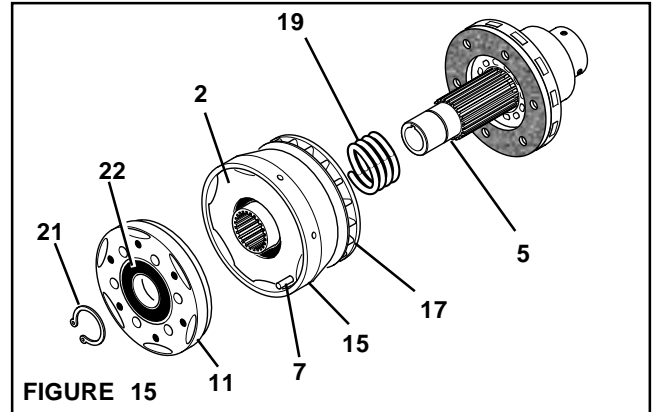
**Special attention should be exercised when working with retaining rings. Always wear safety goggles when working with spring or tension loaded fasteners or devices.**

- Install the Retaining Ring (Item 21) (See Figure 15).
- Slide the Endcap (Item 3) and Cylinder (Item 1) onto the Hub (Item 5) (See Figure 16).
- Apply a drop of Loctite® 242 to the threads of the six Socket Head Cap Screws (Item 25) and secure the Endcap (Item 3) and Cylinder (Item 1) to the Piston Guide (Item 11) (See Figure 16).

**NOTE**

**Ensure the Pistons (Item 8, 9, and 10) do not bind between the Diaphragms (Items 12, 13, and 14) and Piston Guide (Item 11) when the Socket Head Cap Screws (Item 25) are tightened.**

- Alternately and evenly tighten the six Socket Head Cap Screws (Item 25) to the recommended torque (See Table 5).



MODEL	RECOMMENDED TORQUE SOCKET HEAD CAP SCREWS (ITEM 25)
STC600	45 In. Lbs. [5.1 N•m]
STC940	143 In. Lbs. [16.2 N•m]

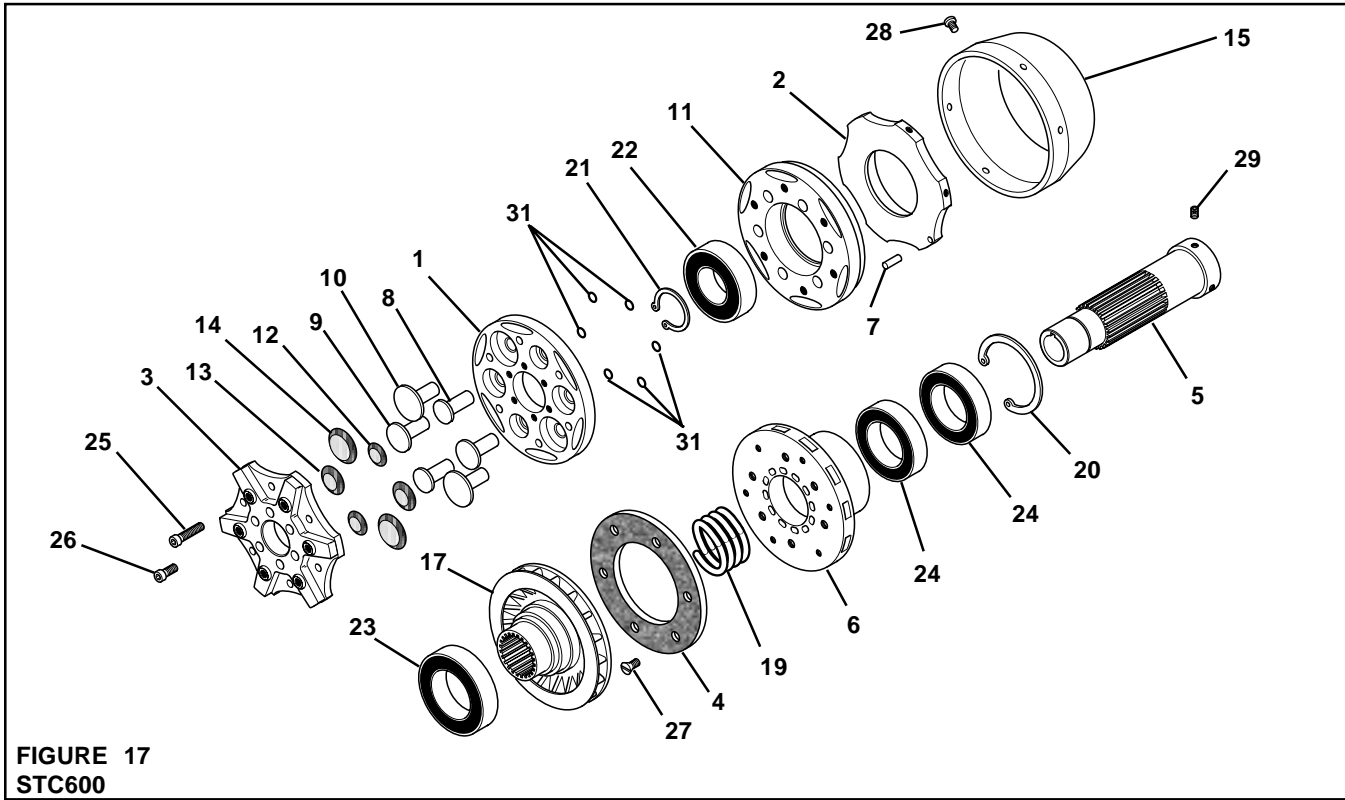
**TABLE 5**

## 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



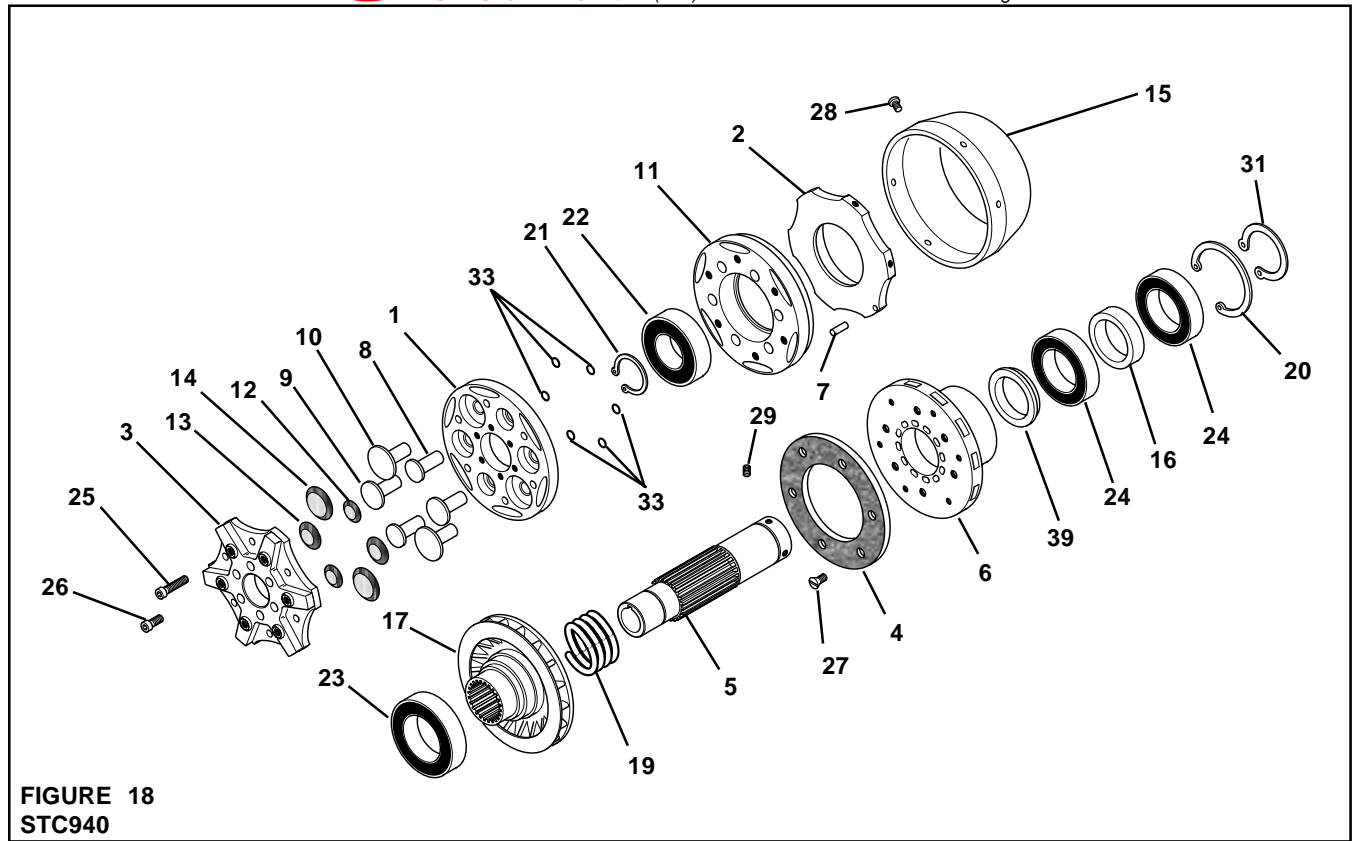
**FIGURE 17**  
**STC600**

ITEM	DESCRIPTION	QTY
1	Cylinder	1
2	Drive Ring	1
3	Endcap	1
4 <sup>1,2</sup>	Friction Facing	1
5	Hub	1
6	Pilot Mount Drive Disc	1
7	Dowel Pin	1
8	Piston (1.00" O.D.)	2
9	Piston (1.25" O.D.)	2
10	Piston (1.50" O.D.)	2
11	Piston Guide	1
12 <sup>1</sup>	Diaphragm (1.25" O.D.)	2
13 <sup>1</sup>	Diaphragm (1.50" O.D.)	2
14 <sup>1</sup>	Diaphragm (1.75" O.D.)	2
15	Shroud	1
17	Rotor	1

ITEM	DESCRIPTION	QTY
19	Return Spring	1
20 <sup>1,2</sup>	Retaining Ring (Int.)	1
21 <sup>1,2</sup>	Retaining Ring (Ext.)	1
22 <sup>1</sup>	Ball Bearing	1
23 <sup>1</sup>	Ball Bearing	1
24 <sup>1</sup>	Ball Bearing	2
25	Socket Head Cap Screw	6
26	Socket Head Cap Screw	6
27 <sup>1,2</sup>	Flat Head Screw	6
28	Round Head Screw	6
29	Set Screw	2
30	Key (Not Shown)	1
31 <sup>1</sup>	O-ring	6
36	Air Line (Not Shown)	--
37	Elbow Fitting (Not Shown)	3
38	Tee Fitting (Not Shown)	5

<sup>1</sup> Denotes Rebuild Kit items.  
 STC600 Rebuild Kit No. 927201.

<sup>2</sup> Denotes Facing Kit items.  
 STC600 Facing Kit No. 927202.



**FIGURE 18**  
**STC940**

ITEM	DESCRIPTION	QTY
1	Cylinder	1
2	Drive Ring	1
3	Endcap	1
4 <sup>1,2</sup>	Friction Facing	1
5	Hub	1
6	Pilot Mount Drive Disc	1
7	Dowel Pin	1
8	Piston (2.00" O.D.)	2
9	Piston (2.25" O.D.)	2
10	Piston (2.50" O.D.)	2
11	Piston Guide	1
12 <sup>1</sup>	Diaphragm (2.25" O.D.)	2
13 <sup>1</sup>	Diaphragm (2.50" O.D.)	2
14 <sup>1</sup>	Diaphragm (2.75" O.D.)	2
15	Shroud	1
16	Spacer	1
17	Rotor	1
19	Return Spring	1

ITEM	DESCRIPTION	QTY
20 <sup>1,2</sup>	Retaining Ring (Int.)	1
21 <sup>1,2</sup>	Retaining Ring (Ext.)	1
22 <sup>1</sup>	Ball Bearing	1
23 <sup>1</sup>	Ball Bearing	1
24 <sup>1</sup>	Ball Bearing	2
25	Socket Head Cap Screw	6
26	Socket Head Cap Screw	6
27 <sup>1,2</sup>	Flat Head Screw	6
28	Round Head Screw	6
29	Set Screw	2
30	Key (Not Shown)	1
31	Retaining Ring (Ext.)	1
33 <sup>1</sup>	O-ring	6
36	Air Line (Not Shown)	--
37	Elbow Fitting (Not Shown)	3
38	Tee Fitting (Not Shown)	5
39	Backing Plate	1

<sup>1</sup> Denotes Rebuild Kit items.  
 STC940 Rebuild Kit No. 927212.

<sup>2</sup> Denotes Facing Kit items.  
 STC940 Facing Kit No. 927213.

## WARRANTY

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

### Conditions

This warranty applies only if: (a) the Product has been installed, used, and maintained in accordance with any applicable Nexen installation or maintenance manual for the Product; (b) the alleged defect is not attributable to normal wear and tear; (c) the Product has not been altered, misused, or used for purposes other than those for which it was intended; and (d) the claimant has complied with the warranty claim procedures set out below in Warranty Claim Procedures.

### Exclusive Remedy

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

### Limitation of Damages

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

### Warranty Claim Procedures

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

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