

# AIR CHAMP<sup>®</sup> PRODUCTS

User Manual



## Dual and Quad Faced Brakes DFB and QFB Models 1150, 1650, 2200, and 2500

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](http://www.nexengroup.com)



# WARNING

Read this manual carefully before installation and operation.

Follow Nexen's instructions and integrate this unit into your system with care.

This unit should be installed, operated and maintained by qualified personnel ONLY.

Improper installation can damage your system or cause injury or death.

Comply with all applicable codes.

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

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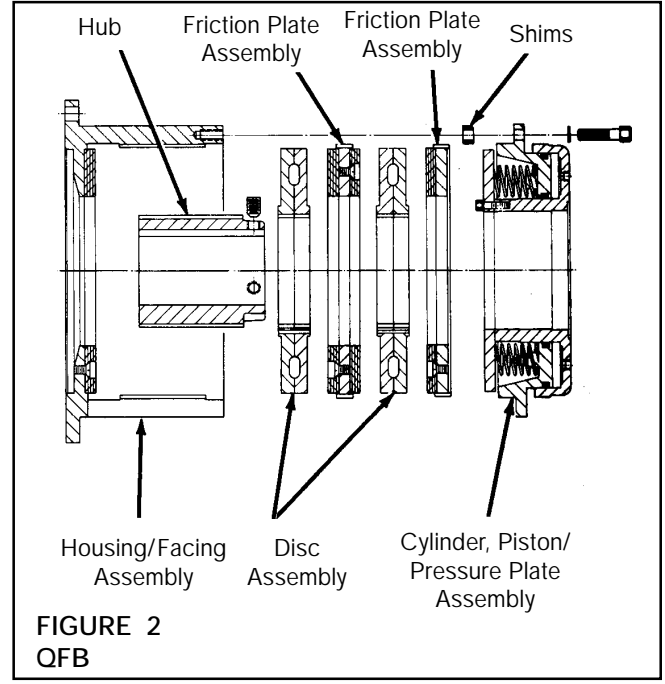
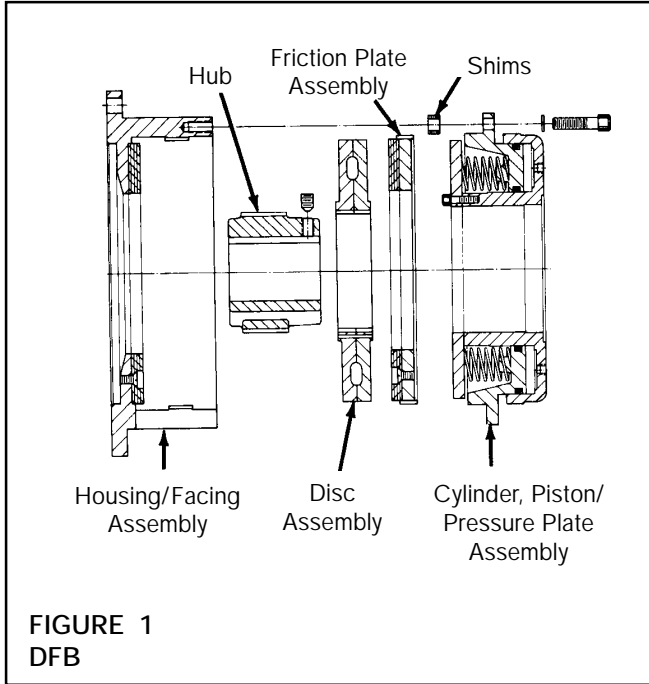
## INTRODUCTION

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

## INSTALLATION

**NOTE:** Nexen's spring engaged, air disengaged Dual Faced Brakes (DFB) and Quad Faced Brakes (QFB) are designed for horizontal shaft mounting only.

Nexen's DFB and QFB elements are partially assembled at the factory. Before installation, separate the elements into subassemblies as shown (See Figures 1 and 2).



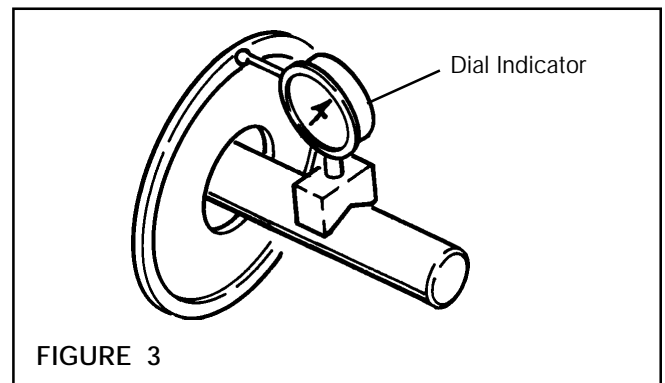
1. Provide a piloting flange and 5/8-11 tapped holes in the bearing supported device or machine component prior to installing the housing (See Table 1 for Pilot Diameter and Bolt Circle).
2. Attach the Housing/Facing Assembly to the bearing supported device or machine frame using customer supplied Grade 8, 5/8-11 Socket Head Cap Screws.

**NOTE:** Control perpendicularly between the shaft and housing mounting surface. Use a Dial Indicator for measurements. Perpendicularity should be less than 0.015 TIR (See Figure 3).

3. Apply Loctite® 242 to the threads and tighten 5/8-11 Socket Head Cap Screws to recommended torque (See Table 2).
4. Install customer supplied key into shaft.
5. Lubricate Hub splines (Item 1) with Never-Seez® or an equivalent high temperature, anti-seize lubricant.

**TABLE 1**

MODEL	PILOT DIAMETER	BOLT CIRCLE
DFB-1150 QFB-1150	11.375 In. [288.9 mm]	6 on 14.750 In. [374.7 mm]
DFB-1650 QFB-1650	16.250 In. [418.8 mm]	12 on 20.000 In. [508.0 mm]
DFB-2200 QFB-2200	21.375 In. [542.9 mm]	12 on 25.500 In. [647.7 mm]
DFB-2500 QFB-2500	24.375 In. [619.1 mm]	12 on 28.750 In. [730.3 mm]



6. Slide Hub (Item 1) over key and onto shaft (See Figures 1 and 2).

NOTE: Axial location of the Hub is important. Refer to Table 3 and Figure 4 for correct Hub location from the Housing mounting surface to the Set Screw end of the Hub.

7. Install Disc Assembly (See Figures 1 and 2).
  - a. Model DFB– Install Disc Assembly (Item 4) on Hub (Item 1).
  - b. Model QFB– Install one Disc Assembly (Item 4) on Hub (Item 1), Friction Plate (Item 19) with Friction Facing (Item 3) on both sides, then second Disc Assembly, respectively.

8. Apply a drop of Loctite® 242 to the threads and install customer supplied set screw and tighten to manufacturer's recommended torque.

9. Install Friction Plate (Item 19) that has Friction Facings (Item 3) on one side only (See Figures 1 and 2).

10. Apply air pressure and install Cylinder, Piston, and Pressure Plate Assembly (Items 5, 6, and 7) onto Housing (See Figures 1 and 2).

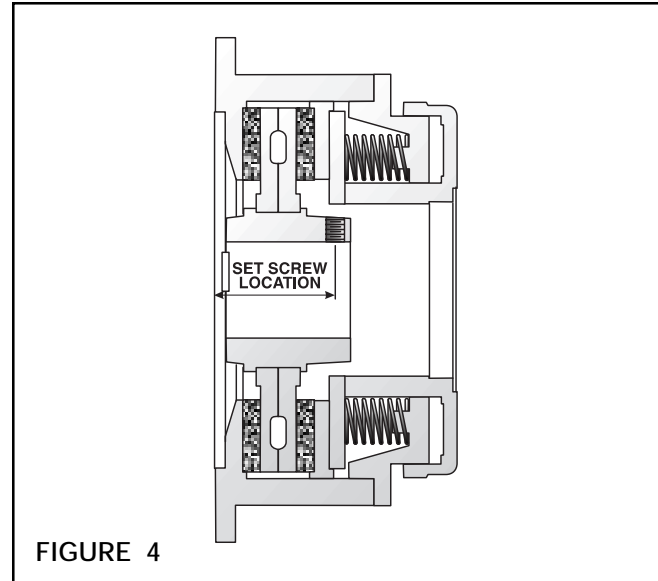
NOTE: Shims are required to achieve the 1.456 dimension (See Figures 5 and 6 for proper Shim placement.)

11. Apply a drop of Loctite® 242 to the threads of the Socket Head Cap Screws (Item 12) (See Figure 6).

12. Install Lock Washers (Item 15) and Socket Head Cap Screws (Item 12). Tighten to the recommended torque (See Table 2).

**TABLE 2**

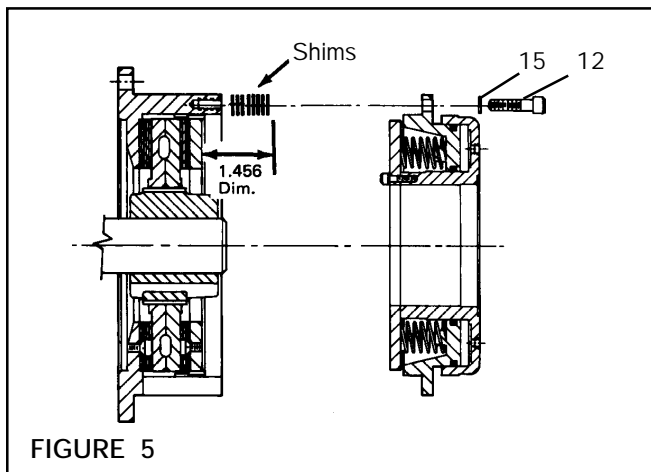
MODEL	ITEM 8	ITEM 11	ITEM 12	5/8-11 CAP SCREWS
DFB-1150 QFB-1150	244 In./Lbs.	20-22 Ft./Lbs.	89 Ft./Lbs.	145 Ft./Lbs.
DFB-1650 QFB-1650	435 In./Lbs.	20-22 Ft./Lbs.	89 Ft./Lbs.	145 Ft./Lbs.
DFB-2200 QFB-2200	435 In./Lbs.	20-22 Ft./Lbs.	89 Ft./Lbs.	145 Ft./Lbs.
DFB-2500 QFB-2500	435 In./Lbs.	20-22 Ft./Lbs.	89 Ft./Lbs.	145 Ft./Lbs.



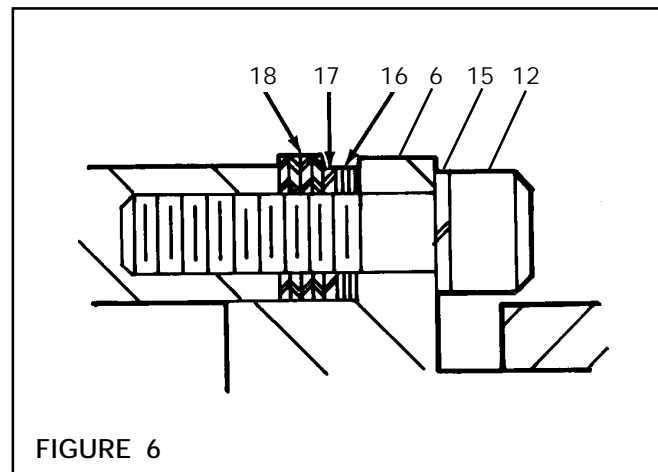
**FIGURE 4**

**TABLE 3**

MODEL	HUB LOCATION	MODEL	HUB LOCATION
DFB-1150	4-3/8 In.	QFB-1150	6-25/32 In.
DFB-1650	5-5/64 In.	QFB-1650	6-5/8 In.
DFB-2200	6-5/16 In.	QFB-2200	8-15/16 In.
DFB-2500	6-1/4 In.	QFB-2500	8-31/32 In.



**FIGURE 5**



**FIGURE 6**


## AIR CONNECTIONS

For quick response, a short air line between the control valve and the DFB/QFB is recommended.

Pneumatically actuated devices require clean, pressure regulated air for maximum performance and long life. Your local Nexen Distributor carries filters, and regulators specifically designed to operate with Nexen Brakes.

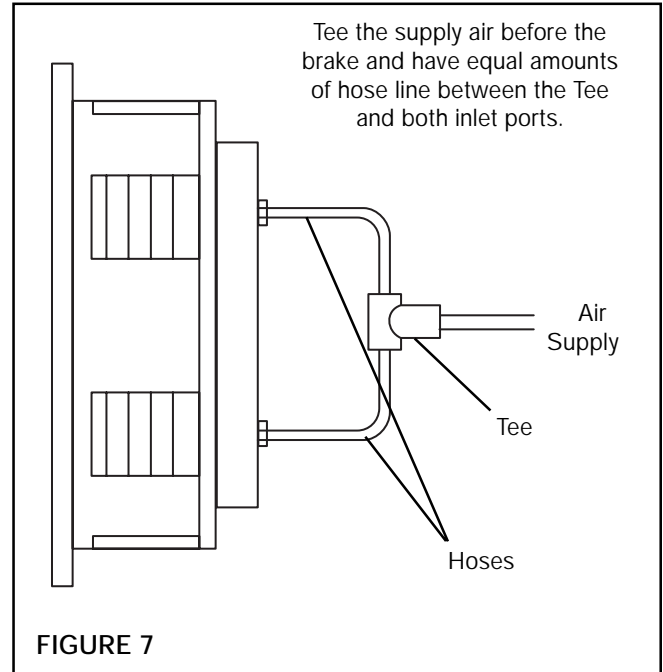
**NOTE:** When connected directly to the brake, rigid pipe or tubing will prevent proper actuation of the brake. Use only flexible hose or tubing.

Valving, tubing, hose, and fitting I.D. must be a minimum of 1/2".



### WARNING

To avoid damage to the brake, Tee the supply air before the brake and have equal amounts of hose line between the Tee and both inlet ports. Use of both ports is mandatory to ensure proper actuation of the brake (See 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 Clutches and 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 or Brake, and use a low viscosity oil such as SAE-10.

Synthetic lubricants are not recommended.

### LUBRICATOR DRIP RATE SETTINGS

**NOTE:** These settings are for Nexen supplied lubricators. If you are not using a Nexen lubricator, calibration must replicate the following procedure

1. Close and disconnect the air line from the unit.
2. Turn the Lubricator Adjustment Knob counter-clockwise three complete turns.
3. Open the air line.
4. Close the air line to the unit when a drop of oil forms in the Lubricator Sight Gage.
5. Connect the air line to the unit.
6. Turn the Lubricator Adjustment Knob clockwise until closed.
7. Turn the Lubricator Adjustment Knob counter-clockwise one-third turn.
8. Open the air line to the unit.

## TROUBLESHOOTING

SYMPTOM	PROBABLE CAUSE	SOLUTION
Failure to engage.	Unexhausted air due to control valve malfunction.	Replace control valve.
	Lack of lubrication on Hub Spline or in air chamber.	Lubricate Hub Spline and check air line lubricator.
	Rigid piping or tubing.	Use flexible tubing.
	Hub not captured on shaft.	Be sure Set Screws in hub are installed.
	Weak or broken Compression Springs.	Replace Compression Springs.
Failure to disengage.	Air not getting to Brake due to control valve malfunction.	Replace control valve.
	Hub not captured on shaft.	Be sure Set Screws in hub are installed.
	Friction lock due to lack of lubrication on Hub Spline or in air chamber.	Lubricate Hub Spline, and check air line Lubricator.
Loss of torque.	Weak or broken Compression Springs.	Replace Compression Springs.
	Worn or contaminated Friction Facings.	Replace Friction Facings.
	Incorrect Friction Facing wear adjustment (QFB only).	Perform Friction Facing wear adjustment.

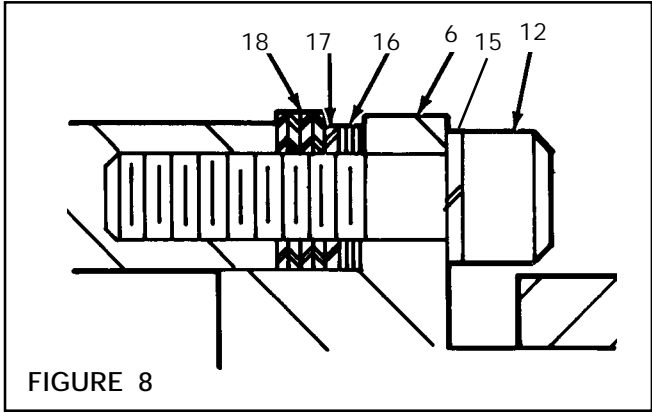
## FRICTION FACING WEAR ADJUSTMENT

NOTE: Friction Facing wear adjustment is not required for DFB Series Brakes.

NOTE: When the QFB Series Brake facings are worn to the point of required adjustment, the gap between the Cylinder and Piston will close, thus preventing brake engagement.

1. Unscrew Socket Head Cap Screws (Item 12) approximately 1/8" and pull Piston (Item 6) loose to free Shims (Items 16, 17, and 18) (See Figure 8).
2. Unscrew Socket Head Cap Screw (Item 12) until it is free; then, remove four Adjustment Shims (Item 18) that extend beyond the other Shims (Item 16 and 17) (See Figure 8).
3. Replace the Socket Head Cap Screw and Lock Washer.
4. Repeat Steps 2 -3 until the remaining Adjustment Shims have been removed.
5. Alternately and evenly tighten Socket Head Cap Screws (Item 12) to recommended torque (See Table 4).

NOTE: Save the Shims that have been removed for use when new Frictions Facings are installed.



**FIGURE 8**

**TABLE 4**

MODEL	ITEM 8	ITEM 11	ITEM 12	5/8-11 CAP SCREWS
DFB-1150 QFB-1150	244 In./Lbs.	20-22 Ft./Lbs.	89 Ft./Lbs.	145 Ft./Lbs.
DFB-1650 QFB-1650	435 In./Lbs.	20-22 Ft./Lbs.	89 Ft./Lbs.	145 Ft./Lbs.
DFB-2200 QFB-2200	435 In./Lbs.	20-22 Ft./Lbs.	89 Ft./Lbs.	145 Ft./Lbs.
DFB-2500 QFB-2500	435 In./Lbs.	20-22 Ft./Lbs.	89 Ft./Lbs.	145 Ft./Lbs.



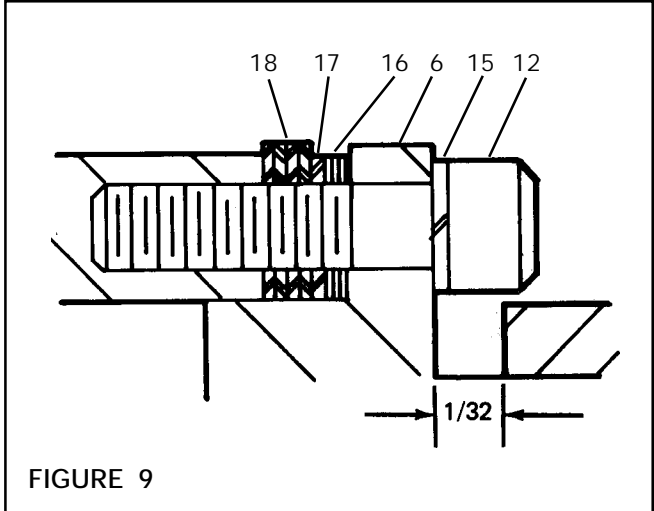
## PARTS REPLACEMENT

NOTE: Friction Facings must be replaced when the gap between the Cylinder and Piston is approximately 1/32" after the Friction Facing wear adjustment has been made (See Figure 9).

1. Alternately and evenly remove and discard the old Socket Head Cap Screws (Item 12) and Lock Washers (Item 15) (See Figure 9).
2. Remove the Shims (Items 16,17, and 18), keeping them in proper sequence for reassembly (See Figure 9).

### WARNING

**Actuator assembly (Items 5-10, 13, and 14) is spring loaded. Always wear safety goggles when working with spring or tension loaded devices.**



3. Remove spring loaded actuator assembly (Items 5-10, 13, and 14) (See Figure 10).

NOTE: DFB Series Brakes contain one Drive Disc Assembly (Item 4) and one Friction Plate (Item 19). QFB Series Brakes contain two Drive Disc Assemblies (Item 4) and two Friction Plates (Item 19).

4. Remove Friction Plate (Item 19) and Drive Disc Assembly (Item 4) (See Figure 10).

NOTE: The Flat Head Screws are assembled with a micro-encapsulated two part epoxy thread locking system. If removal is difficult, strike the end of the screwdriver with a hammer to break the crystalline structure or the compound before attempting to remove the Flat Head Screws.

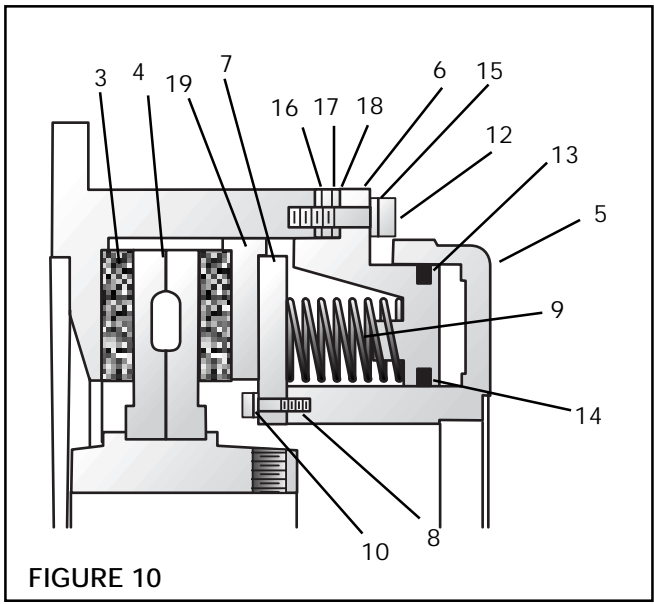
5. Remove Flat Head Screws (Item 11) securing Friction Facings (Item 3).
6. Install the new Flat Head Screws (Item 11) and new Friction Facing (Item 3) into Housing (Item 2). Tighten Flat Head Screws to recommended torque (See Table 5).

TABLE 5

MODEL	ITEM 8	ITEM 11	ITEM 12	5/8-11 CAP SCREWS
DFB-1150 QFB-1150	244 In./Lbs.	20-22 Ft./Lbs.	89 Ft./Lbs.	145 Ft./Lbs.
DFB-1650 QFB-1650	435 In./Lbs.	20-22 Ft./Lbs.	89 Ft./Lbs.	145 Ft./Lbs.
DFB-2200 QFB-2200	435 In./Lbs.	20-22 Ft./Lbs.	89 Ft./Lbs.	145 Ft./Lbs.
DFB-2500 QFB-2500	435 In./Lbs.	20-22 Ft./Lbs.	89 Ft./Lbs.	145 Ft./Lbs.

### WARNING

**Pressure Plate is spring loaded. Always wear safety goggles when working with spring or tension loaded devices.**



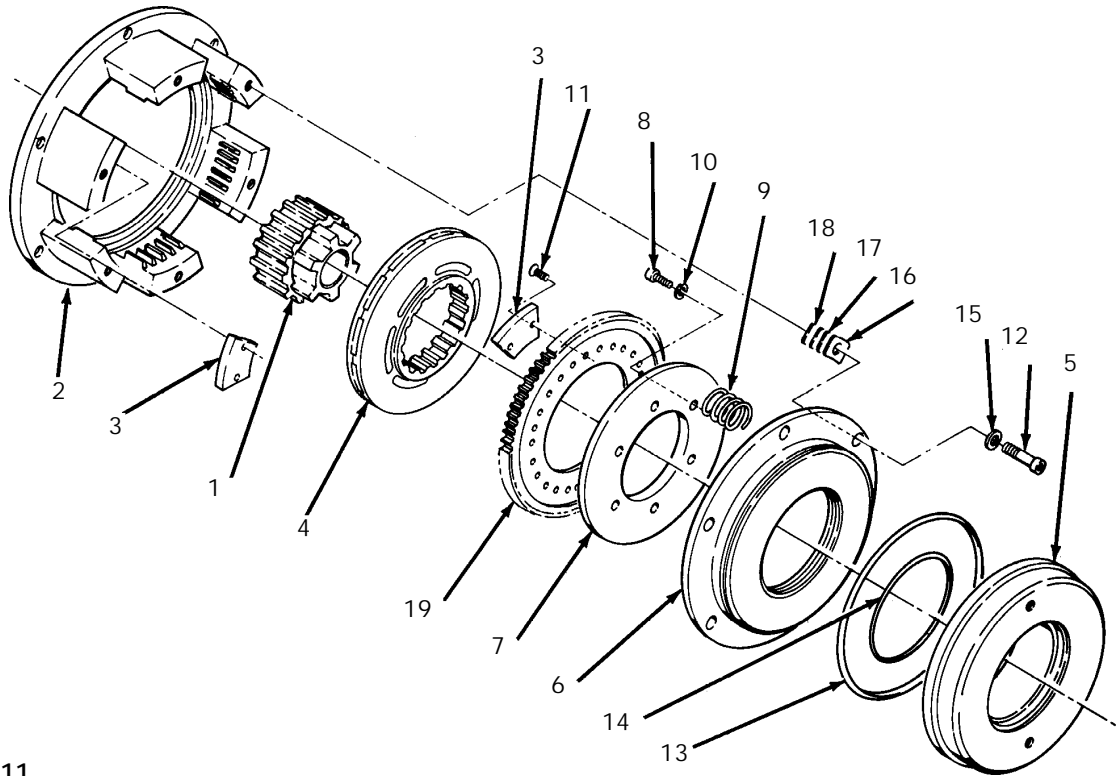
7. Alternately and evenly loosen the old Socket Head Cap Screws (Item 8) to relieve spring tension on Pressure Plate (Item 7) (See Figure 10).
  8. Remove and discard the old Socket Head Cap Screws (Item 8) and Lock Washers (Item 10) (See Figure 10).
  9. Remove the Pressure Plate (Item 7) (See Figure 10).
  10. Remove and discard the old Compression Springs (Item 9) from the Piston (Item 6) (See Figure 10).
  11. Separate the Piston (Item 6) and Cylinder (Item 5) (See Figure 10).
  12. Remove and discard the old O-ring Seals (Items 13 and 14) (See Figure 10).
  13. Clean O-ring contact surfaces with fresh safety solvent.
  14. Lubricate new O-ring Seals and O-ring contact surfaces with a thin film of fresh O-ring lubricant.
  15. Install new O-ring Seals (Items 13 and 14) (See Figure 10).
  16. Slide the Piston (Item 6) back into the Cylinder (Item 5) (See Figure 10).
  17. Install the new Compression Springs (Item 9) (See Figure 10).
  18. Apply a drop of Loctite® 242 locking compound to the new Socket Head Cap Screws (Item 8).
  19. Using the new Socket Head Cap Screws (Item 8) and Lock Washers (Item 10), secure the Pressure Plate (Item 7) to the Cylinder (Item 5) (See Figure 10).
  20. Alternately and evenly install and tighten the new Socket Head Cap Screws (Item 8) and Lock Washers (Item 10) to the recommended torque (See Table 5).
  21. Apply a drop of Loctite® 242 to the threads of the Socket Head Cap Screws (Item 12).
- NOTE: Be certain Shims are reinstalled in the proper sequence. Install new Shims only when performing Friction Facing wear adjustment (QFB only).
22. Reinstall the spring loaded actuator assembly on Housing (Item 2) with Shims (Items 16, 17, and 18), new Socket Head Cap Screws (Item 12), and new Lock Washers (Item 15) (See Figure 10).
  23. Alternately and evenly tighten the new Socket Head Cap Screws (Item 12) to the recommended torque (See Table 5).

## REPLACEMENT PARTS

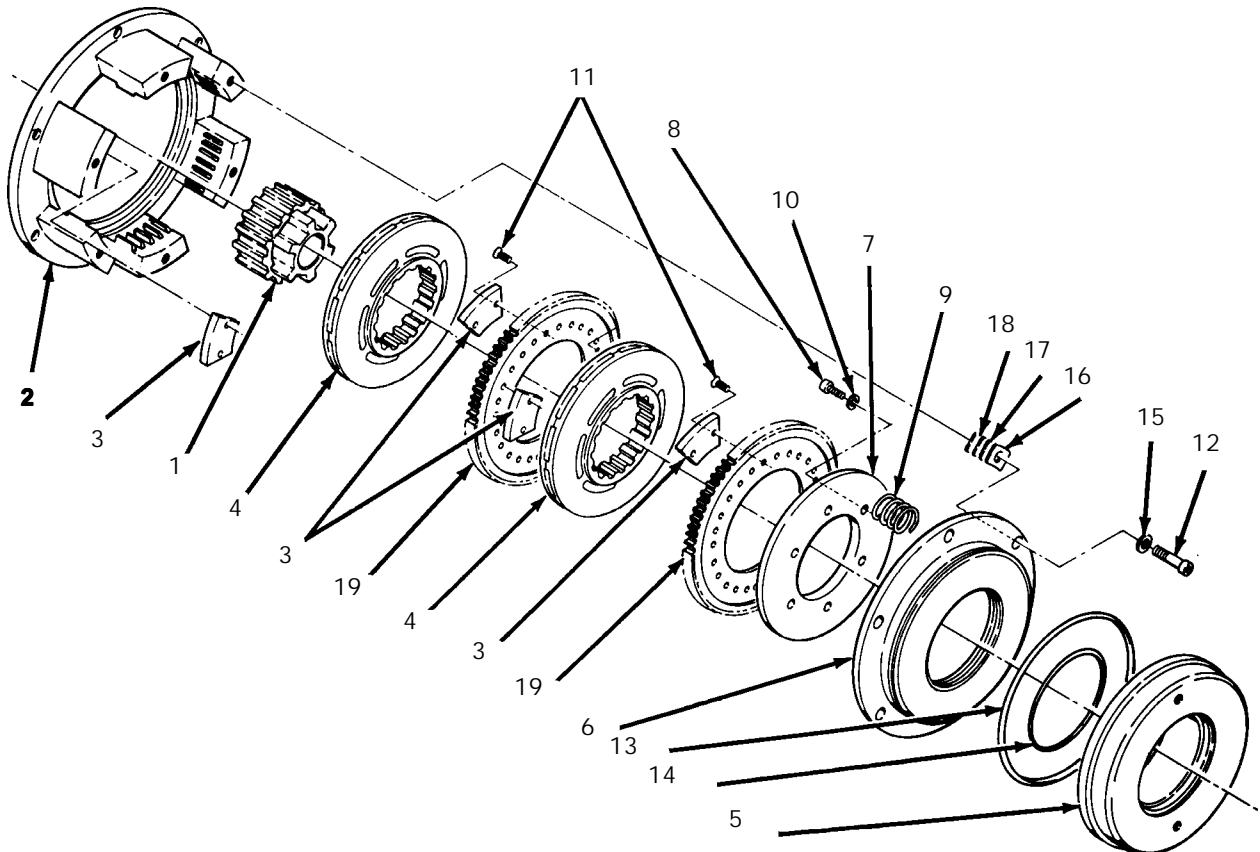
The item or balloon number for all Nexen products is used for part identification on all product parts lists, product price lists, unit assembly drawings, bills of materials, and instruction manuals.

When ordering replacement parts, specify model designation, item number, part description, and quantity. Purchase replacement parts through your local Nexen Distributor.

**PARTSLIST**



**FIGURE 11**  
**DFB EXPLODED VIEW**



**FIGURE 12**  
**QFB EXPLODED VIEW**

ITEM	DESCRIPTION	1150		1650		2200		2500	
		DFB	QFB	DFB	QFB	DFB	QFB	DFB	QFB
1	Hub	1	1	1	1	1	1	1	1
2	Housing	1	1	1	1	1	1	1	1
3 <sup>1 2</sup>	Friction Facing	12	24	12	24	12	24	12	24
4	Drive Disc Assembly	1	2	1	2	1	2	1	2
5	Cylinder	1	1	1	1	1	1	1	1
6	Piston	1	1	1	1	1	1	1	1
7	Pressure Plate	1	1	1	1	1	1	1	1
8 <sup>2</sup>	Socket Head Cap Screw	6	6	6	6	10	22	10	10
9 <sup>2</sup>	Compression Spring	10	10	8	8	10	10	15	15
10 <sup>2</sup>	Lock Washer	6	6	6	6	10	22	10	10
11 <sup>1 2</sup>	Flat Head Screw	24	48	24	48	24	48	24	48
12 <sup>2</sup>	Socket Head Cap Screw	6	6	12	12	12	12	12	12
13 <sup>2</sup>	O-ring Seal	1	1	1	1	1	1	1	1
14 <sup>2</sup>	O-ring Seal	1	1	1	1	1	1	1	1
15 <sup>2</sup>	Lock Washer	6	6	12	12	12	12	12	12
16	Shim 0.015"	6	12	12	24	12	24	12	24
17	Shim 0.075"	6	12	12	24	12	24	12	24
18	Shim 0.075"	12	24	24	48	24	48	24	48
19	Friction Plate	1	2	1	2	1	2	1	2

### COMPONENT PRODUCT NUMBERS

MODEL DFB/QFB	PRODUCT NUMBER	
	STD	HICO
1150	964028	964029
1650	964031	964032
2200	964118	964119
2500	964037	964038

## WARRANTIES

### Warranties

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

### Exclusive Remedy

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

### Limitation of Nexen's Liability

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

### Limitation of Damages

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

### Warranty Claim Procedures

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

**nexen**<sup>®</sup>

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

800.843.7445  
Fax: 651.286.1099  
www.nexengroup.com

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