

AIR CHAMP[®] PRODUCTS

User Manual



**Models TSE-450, TSE-600,
TSE-800-1, and TSE-1000**

In accordance with Nexen's established policy of constant product improvement, the specifications contained in this manual are subject to change without notice. Technical data listed in this manual are based on the latest information available at the time of printing and are also subject to change without notice.

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ISO 9001 Certified



WARNING

Read this manual carefully before installation and operation.

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

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

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

Comply with all applicable codes.

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INSTALLATION

CAUTION

Do not flange mount TSE Brakes. Bearing preload will result after bushing is installed and premature bearing failure will ensue.

1. Before mounting, ensure Cylinder (Item 10) has adequate clearance to move freely (See Figure 1 and Table 1).
2. Remove any dirt, grease, or foreign material from the Friction Disk Hub (Item 1) bore and the tapered surfaces of the Q.D. Bushing.

NOTE: Do not use lubricants when installing Q.D. Bushing.

Do not strike Q.D. Bushing to “set” it in the bore of the Friction Disc Hub.

3. Slide Q.D. Bushing into the bore of the Friction Disc Hub (Item 1) (See Figure 2).

WARNING: Do not install bolts into the threaded holes of the Q.D. Bushing. The threaded holes in the Q.D. Bushing are only used for removal of the Q.D. Bushing.

4. Insert cap screws into Q.D. Bushing, aligning them with the tapped holes in the Friction Disc Hub (Item 1) (See Figure 2).
5. Position TSE Brake on the shaft (See Figure 2).

NOTE: There should be an $\frac{1}{8}$ - $\frac{1}{4}$ " gap between the Q.D. Bushing flange and the Friction Disc Hub after the cap screws have been tightened to the recommended torque.

Runout is minimized if a Dial Indicator is used as the Q.D. Bushing cap screws are tightened. Place contact tip of Dial Indicator on smooth surface of the Friction Disc Hub (Item 1) to measure runout. Runout on this surface must not exceed 0.005 TIR when cap screws are tightened (See Figure 2).

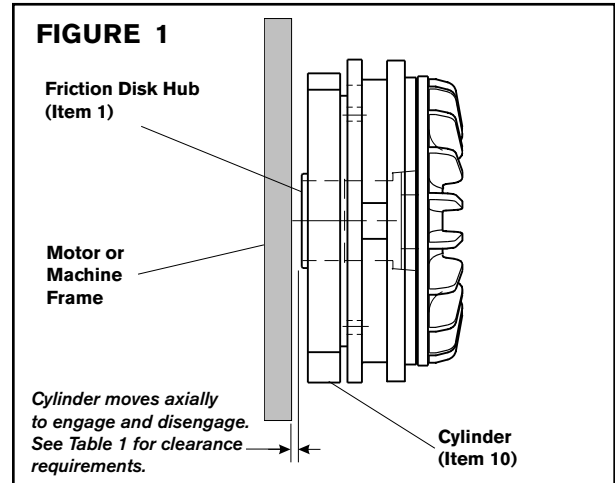


TABLE 1

Model	Minimum Clearance for Cylinder (Friction Disc Hub to Machine Frame)
TSE-450	0.125 In. [3.175 mm]
TSE-600	0.125 In. [3.175 mm]
TSE-800-1	0.125 In. [3.175 mm]
TSE-1000	0.375 In. [9.525 mm]

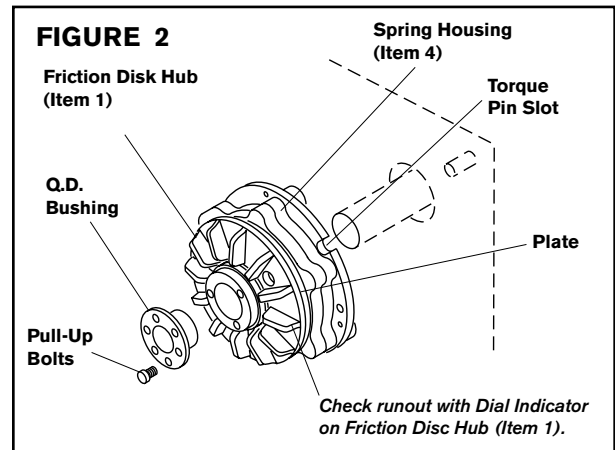


TABLE 2

Model	Bush- ing Type	Maximum Bore (Std. depth Keyway)	Pull-Up Bolt Tightening Torque
TSE-450	JA	1.000 In.	5.0 Ft. Lbs. [6.7 N•m]
TSE-600	SH	1.375 In.	10.0 Ft. Lbs. [13.5 N•m]
TSE-800-1	SK	2.125 In.	15.0 Ft. Lbs. [20.2 N•m]
TSE-1000	E	2.750 In.	60.0 Ft. Lbs. [81.0 N•m]

6. Alternately and evenly tighten Q.D. Bushing cap screws to the recommended torque (See Table 2).

NOTE: Keep torque pin as short as possible.

7. Secure brake Spring Housing (Item 4) to prevent rotation and take up brake torque. A torque pin slot is provided in the Spring Housing flange (See Figure 2).

AIR CONNECTIONS

NOTE: Refer to Figure 3.

CAUTION

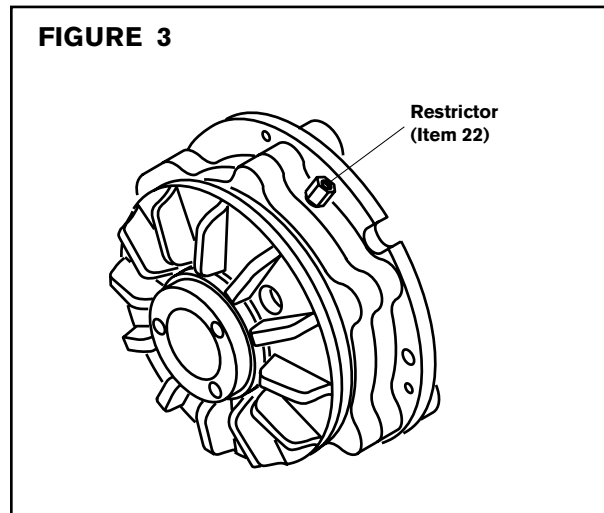
Do not use rigid pipe or tubing when making air line connections. Align the air inlet port to the six o'clock down position to allow condensation in the air chamber to drain out of the air chamber.

WARNING: Never operate brake without the Restrictor installed.

NOTE: The Restrictor is provided to prevent Shoulder Bolt (Item 6) fatigue from impact during operation.

NOTE: The Auxiliary Cooling Option has been removed from all standard Nexen S, T, and TSE series brakes. It is a passage for compressed air to be connected for increased thermal capacity. If you desire this feature or are replacing a brake that has this feature please contact Nexen at 1-800-843-7445.

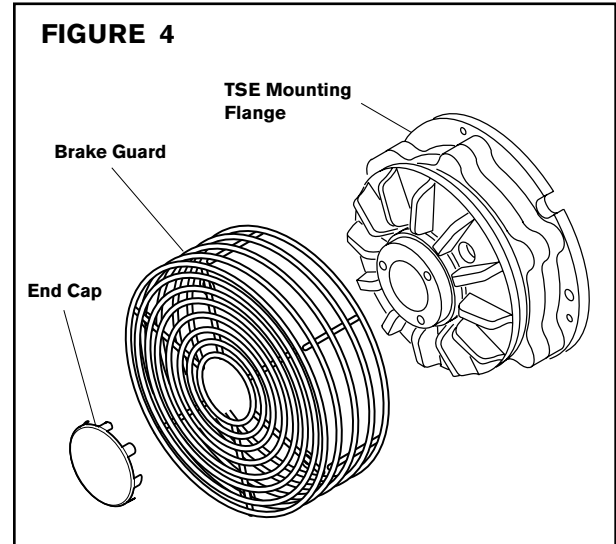
FIGURE 3



BRAKE GUARD INSTALLATION

NOTE: Refer to Figure 4.

1. Align the mounting holes of the Brake Guard with the four tapped holes in the TSE Mounting Flange.
2. Using the four 10-24 X 3/8 Phillips Head Pan Screws and Internal Tooth Lock Washers, secure the Brake Guard to the TSE.
3. If the Brake Guard is not through shaft mounting, place the End Cap over the front of the Brake Guard and bend the tabs around the Brake Guard to hold the End Cap in place.



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

OPERATION

The TSE Brake will remain engaged until sufficient air pressure is applied to release it. Depending upon the length of the air lines and the type of controls used, the amount of release air may vary.

CAUTION

Do not use more air pressure than required to release the brake (100 psi maximum).

Apply increasing amounts of air pressure to the brake until the Friction Disc Hub turns freely.

1. To manually release the TSE Brake, remove the three Shoulder or Socket Head Cap Screws (Item 6) and replace them with customer supplied cap screws (See Table 3).
2. Tighten the cap screws alternately and evenly to draw the Plate (Item 3) and Friction Facing (Item 5) away from the Friction Disc Hub (Item 1).

TABLE 3

Model	Cap Screw Size
TSE-450	10-24 x 1-1/2
TSE-600	5/16-18 x 1-3/4
TSE-800-1	3/8-16 x 2
TSE-1000	3/8-16 x 2-1/4

MAINTENANCE

Periodically inspect all mounting bolts and air line fittings to make sure they are securely tightened. Pay particular attention to Shoulder Screws or Socket Head Cap Screws (Item 6). If these screws are loose, the Cylinder (Item 10) travel will increase, causing the O-ring Seals to leak air. Tighten the Shoulder Screws or Socket Head Cap Screws (Item 6) to the recommended torque (See Table 4).

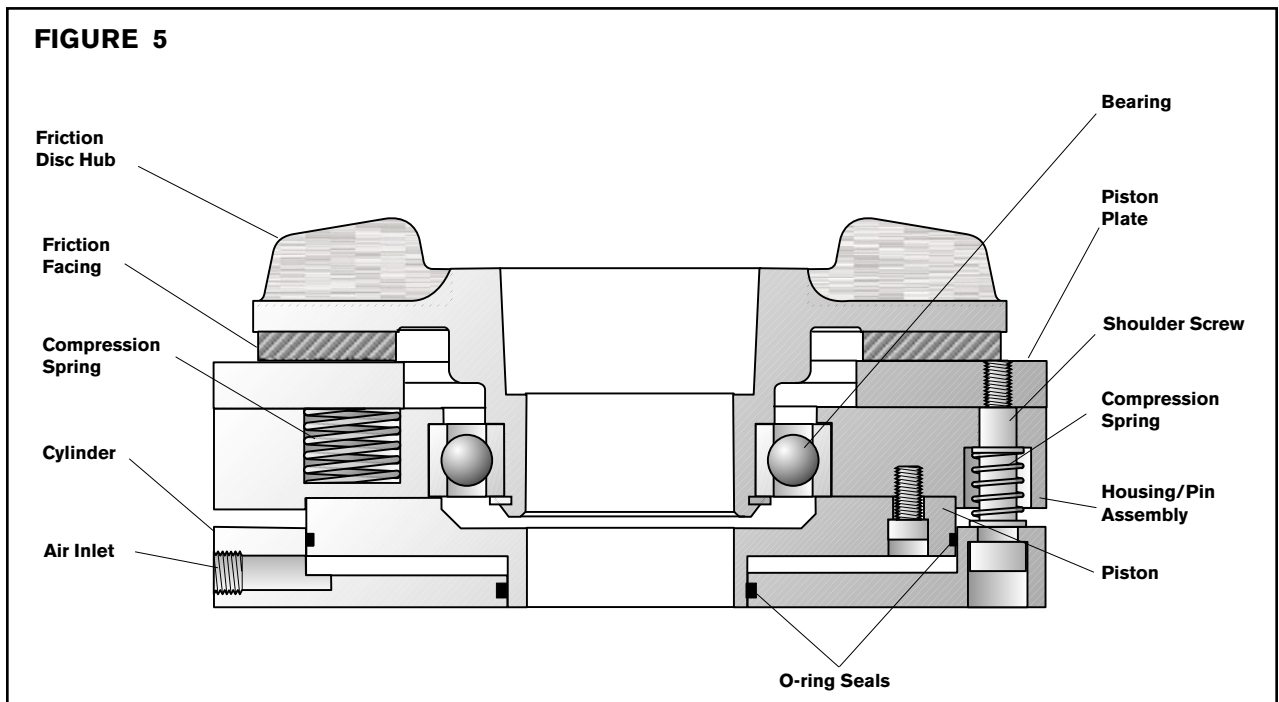
Inspect Friction Facings (Item 5) for signs of wear and replace if worn down to where the Machine Screws (Item 14) may score the Friction Disc Hub.

TABLE 4

Model	Tightening Torques
TSE-450	45 In. Lbs. [6.7 Nm]
TSE-600	230.0 In. Lbs. [26 Nm]
TSE-800-1	450.0 In. Lbs. [50.8 Nm]
TSE-1000	388.0 In. Lbs. [43.8 Nm]

TROUBLESHOOTING

Symptom	Probable Cause	Solution
Failure to engage.	Air not being exhausted due to a control valve malfunction.	Replace the control valve.
	Broken Compression Springs.	Replace the Compression Springs.
	Internal contamination or corrosion.	Align the exhaust port to the six o'clock down position to allow condensation to drain out of the exhaust port.
Failure to disengage.	Low or lack of air pressure.	Check for control valve malfunction and replace it if necessary.
		Check for air leaks in the air lines and around the O-rings Seals. Replace the air lines or O-ring Seals if necessary.
	Internal contamination or corrosion.	Align the exhaust port to the six o'clock down position to allow condensation to drain out of the exhaust port.
Loss of torque.	Worn or dirty Friction Facings.	Replace the Friction Facings.



PARTS REPLACEMENT

FRICITION FACINGS

NOTE: Refer to Figure 6.

1. Align the holes in the Friction Disc Hub (Item 1) with the Machine Screws (Item 14) holding the split Friction Facing (Item 5).
2. Remove the old Machine Screws (Item 14).
3. Remove the old split Friction Facings (Item 5).
4. Install the new split Friction Facings (Item 5).
5. Secure the new split Friction Facings (Item 5) using the new Machine Screws (with locking patch) (Item 14).
6. Tighten the new Machine Screws to the recommended torque (See Table 5).

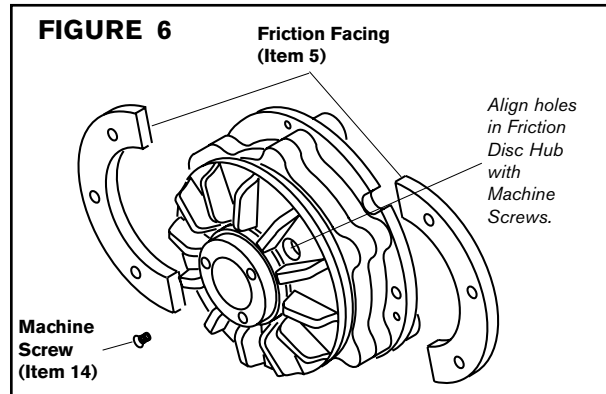
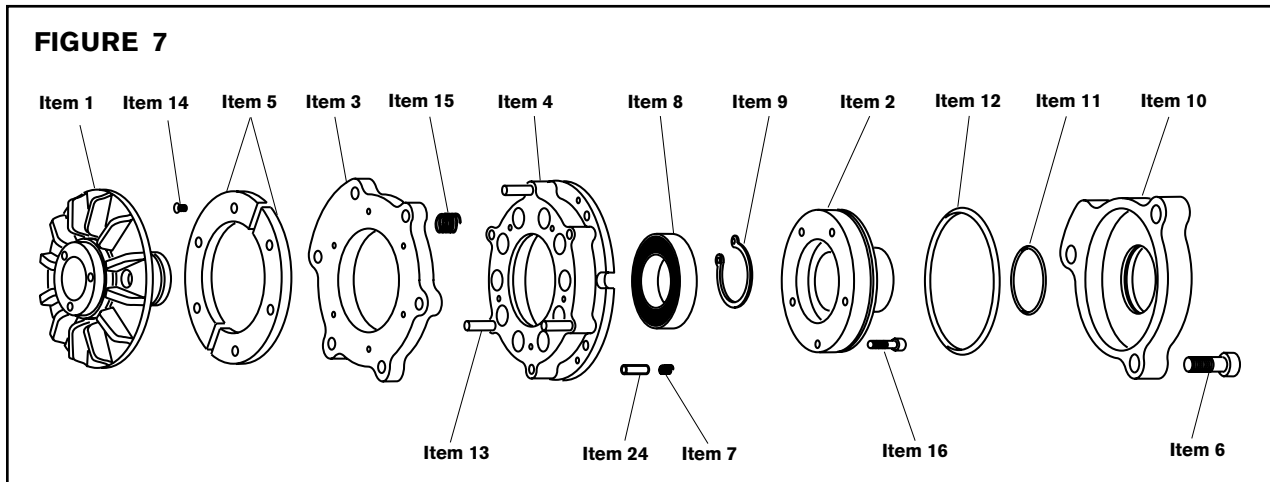


TABLE 5

Model	Tightening Torques
TSE-450	26.0 In. Lbs. [3.0 Nm]
TSE-600	26.0 In. Lbs. [3.0 Nm]
TSE-800-1	86 In. Lbs. [9.7 Nm]
TSE-1000	86 In. Lbs. [9.7 Nm]

BEARING, COMPRESSION SPRINGS, AND O-RING SEALS



NOTE: Refer to Figure 7.

WARNING: Shoulder and Socket Head Cap Screws are spring loaded. Always wear safety goggles when working with spring or tension loaded fasteners or devices.

1. Alternately and evenly remove the Shoulder or Socket Head Cap Screws (Item 6).
2. Remove the Cylinder (Item 10).

3. Remove the Compression Springs (Item 7).

NOTE: For TSE-800-1 units the Spacer (Item 24) must also be removed.

4. Remove the O-ring Seals (Items 11 and 12).

WARNING: Spring Housing and Piston Plate are spring loaded. Spring Housing and Piston Plate can spring apart, resulting in personal injury if Spring Housing and Piston Plate are not clamped together.

5. Remove the Socket Head Cap Screws (Item 16).
 6. Remove the Piston (Item 2).
 7. Using C-Clamps, compress the Spring Housing (Item 4) against Piston Plate (Item 3).
- 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.**
8. Remove the Retaining Ring (Item 9).
 9. Press the Friction Disc Hub (Item 1) out of the Bearing (Item 8).
 10. Slowly unclamp the Spring Housing (Item 4) and Piston Plate (Item 3).
 11. Using a bearing puller, remove the Bearing (Item 8) from the Spring Housing (Item 4).
 12. Clean the bearing bore of the Spring Housing (Item 4) with fresh safety solvent to remove all old Loctite® residue.
 13. Apply an adequate amount of Loctite® 680 to evenly coat O.D. of new Bearing (Item 8) and press new Bearing into Spring Housing (Item 4).
 14. Equally space the Compression Springs (Item 15) in the spring pockets of the Spring Housing (Item 4).
 15. Slide the Piston Plate (Item 3) onto the Dowel Pins (Item 13) of the Spring Housing (Item 4).
 16. Using C-clamps, compress the Piston Plate (Item 3) against the Compression Springs (Item 15) and Spring Housing (Item 4).
 17. Press the Friction Disc Hub (Item 1) into the new Bearing (Item 8).
 18. Reinstall the Retaining Ring (Item 9).
 19. Remove the C-clamps securing the Spring Housing against the Piston Plate.
 20. Press the Piston (Item 2) into the Spring Housing (Item 4).
 21. Apply Loctite® 242 to entire length and under the heads of the Socket Head Cap Screw (Item 16). Alternately and evenly tighten the Socket Head Cap Screws to the recommended torque (See Table 6).

NOTE: Loctite® must seal all air gaps between the Socket Head Cap Screws (Item 16) and the clearance holes.

22. Reinstall the Compression Springs (Item 7).

NOTE: For TSE-800-1 units, also install Spacer (Item 24).

23. Clean the O-ring grooves of the Piston (Item 2) and Cylinder (Item 10); then, lubricate the new O-rings and o-ring contact surfaces with a thin film of fresh o-ring lubricant.

NOTE: Avoid pinching of O-ring Seals when assembling Piston and Cylinder.

24. Install the new O-ring Seals (Items 11 and 12).
25. Slide the Cylinder (Item 10) onto the Piston (Item 2).
26. TSE-450 and TSE-600: Apply Loctite® 242 to the threads of the Socket Head Cap Screws or Shoulder Screws (Item 6); then, alternately and evenly tighten them to the recommended torque (See Table 6).

TSE-800-1: Alternately and evenly tighten the Socket Head Cap Screws (Item 6) to the recommended torque (See Table 6). Do not use lubricants or thread locking compounds on the Socket Head Cap Screws (Item 6).

WARNING: The TSE-1000 uses Nexen Shoulder Screws only. The Shoulder Screws are specifically designed for high stress and prevailing torque capabilities.

TSE-1000: Lubricate the tapped holes in the Piston Plate (Item 3) with a light machine oil before installing the Shoulder Screws (Item 6); then, alternately and evenly tighten them to the recommended torque (See Table 6).

TABLE 6

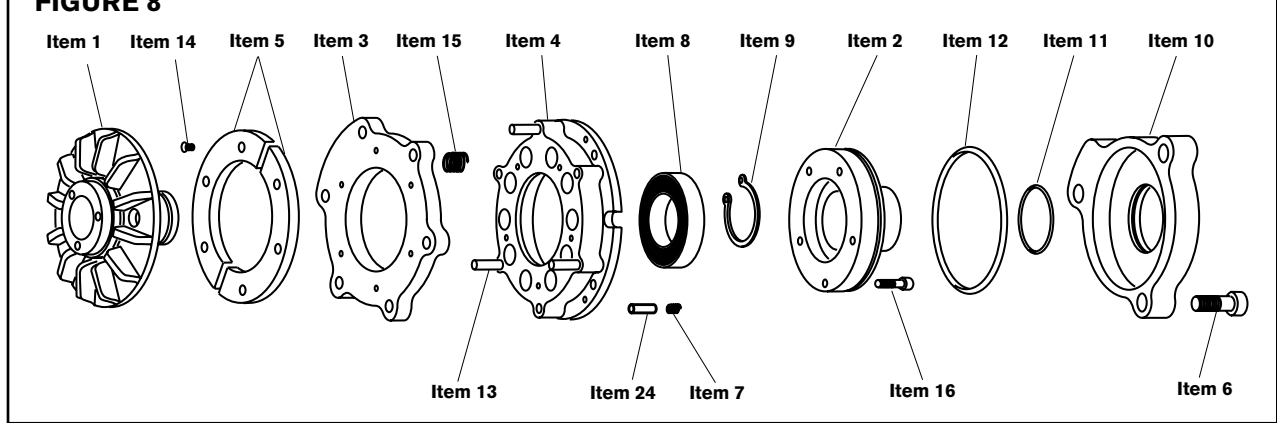
Model	Item 6	Item 16
TSE-450	45.0 In. Lbs. [5.0 Nm]	60.0 In. Lbs. [6.7 Nm]
TSE-600	230.0 In. Lbs. [26.0 Nm]	60.0 In. Lbs. [6.7 Nm]
TSE-800-1	300.0 In. Lbs. [34.07 Nm]	95.0 In. Lbs. [10.7 Nm]
TSE-1000	388.0 In. Lbs. [43.8 Nm]	95.0 In. Lbs. [10.7 Nm]

REPLACEMENT PARTS LIST

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.

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

When ordering replacement parts, specify model



ITEM	DESCRIPTION	QTY
1	Friction Disc Hub	1
2	Piston	1
3	Piston Plate	1
4 ⁶	Spring Housing	1
5 ¹	Friction Facing	1
6 ^{1,2}	Shoulder or Socket Head Cap Screw	3
7	Compression Spring	3
8 ¹	Bearing	1
9	Retaining Ring	1
10	Cylinder	1
11 ¹	O-ring Seal (Small)	1
12 ¹	O-ring Seal (Large)	1
13 ⁶	Dowel Pin	3
14 ¹	Machine Screw	6
15 ³	Compression Spring	-
16 ⁴	Cap Screw	--
19	Hose Assembly (Not Shown)	1
22	Restrictor (Not Shown)	1
24 ⁵	Spacer	3

¹ Denotes repair kit items.

² **WARNING: Model TSE-1000 uses Nexen Shoulder Screws only.**

³ See Table 7 for product number and quantity.

⁴ TSE-450 and TSE-600: Qty 5. TSE-800-1 and TSE-1000: Qty 3.

⁵ Spacer for TSE-800-1 only.

⁶ Order Air Chamber Assembly in place of the Spring Housing (Item 4) and Dowel Pin (Item 13) (See Table 8).

TABLE 7

Model	Product No.	Qty.
TSE-450	818862	6
	818800	8
	818861	10
TSE-600	820362	6
	820300	8
	820361	10
TSE-800-1	822495	6
	822494	8
	822496	10
TSE-1000	822562	6
	822500	8
	822561	10

TABLE 8

Model	Spring Housing Assembly w. Pin
TSE-450	Prod. No. 12228
TSE-600	Prod. No. 12229
TSE-800-1	Prod. No. 9578
TSE-1000	Prod. No. 12231

Facing Kit: One split Friction Facing and six Machine Screws

Repair Kit: Optional Facing Kit (See Table 10) plus one Bearing, three Shoulder Screws (Socket Head Cap Screws for TSE-800-1), three Retaining Rings, and two O-ring Seals.

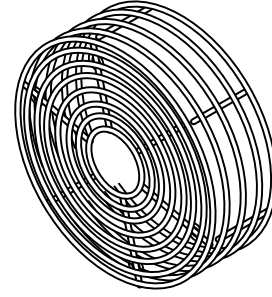
Specify the model and kit product number when ordering facing and repair kits (See Table 10).

ACCESSORIES

TABLE 9
Brake Guards

Model	Product No.
TSE-450	817700
TSE-600	818300
TSE-800-1	826300
TSE-1000	828200

FIGURE 9
Brake Guard



FACING AND REPAIR KITS

TABLE 10

Model	Facing Kit	Repair Kit w/out Facing Kit	Repair & Facing Kit
TSE-450	818974	818870	818700
TSE-600	820574	820370	820200
TSE-800-1	827474	822470	827610
TSE-1000	827574	822570	827700
		822571	

* Use this repair kit for TSE-1000's with serial numbers higher than 1273138.



WARRANTY

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 damages, liquidated damages or other damages and liabilities which Buyer shall be obligated to pay or which Buyer may incur based

upon, related to or arising out of its contracts with its customers or other third parties. In no event shall Nexen be liable for any amount of damages in excess of amounts paid by Buyer for Products or services as to which a breach of contract has been determined to exist. The parties expressly agree that the price for the Products and the services was determined in consideration of the limitation on damages set forth herein and such limitation has been specifically bargained for and constitutes an agreed allocation of risk which shall survive the determination of any court of competent jurisdiction that any remedy herein fails of its essential purpose.

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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