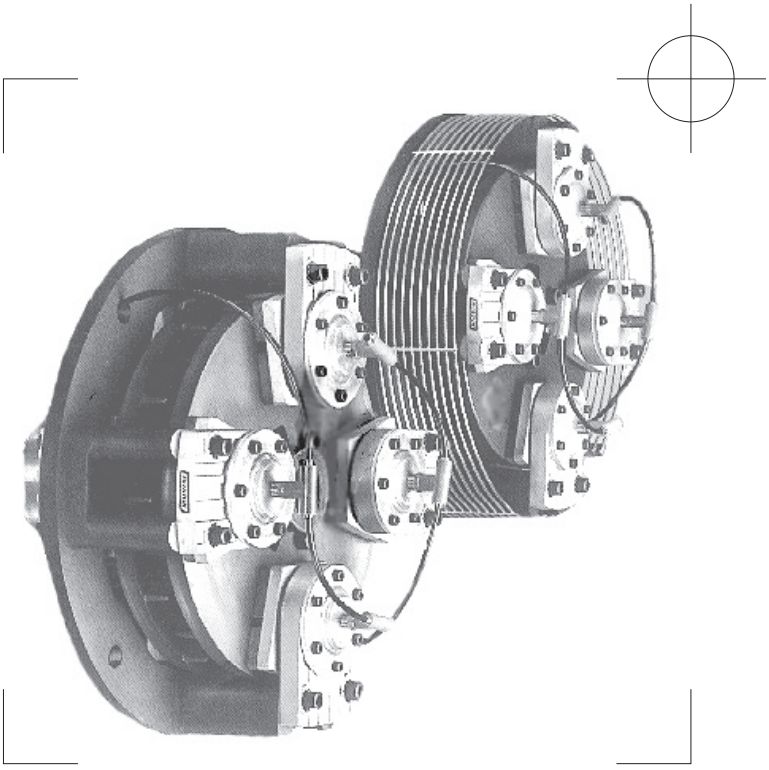
nexen

AIR CHAMP® PRODUCTS

User Manual



Tension Control Brakes

Models TCB-10, TCB-14 & TCB-20

RoHS compliant 2002/95/EC

FORM NO. L-20065-L-0914

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

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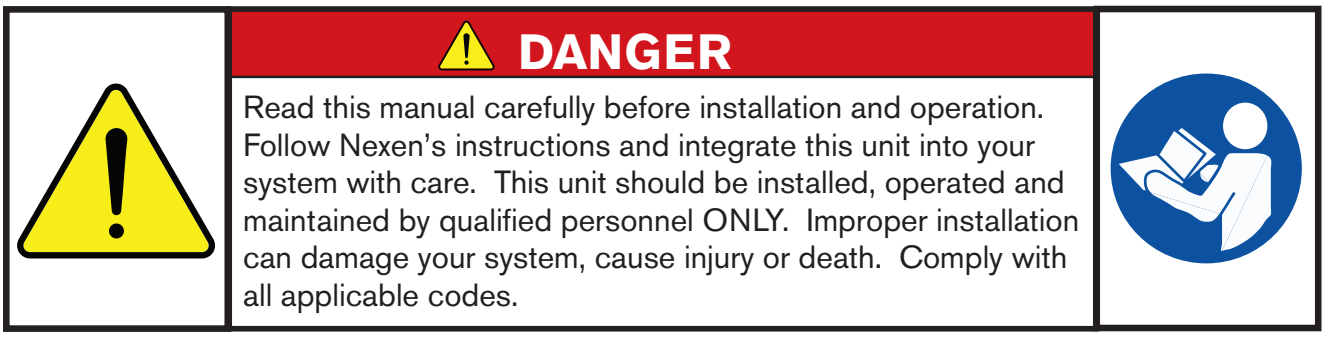

This document is the original, non-translated, version.

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

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

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

Nexen Group, Inc.
560 Oak Grove Parkway
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ISO 9001 Certified

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GENERAL SPECIFICATIONS

Specifications	
Torque	Up to 1175 Nm (10400 in-lbs)
Actuation Pressure	1 - 5.5 bar (14.5 - 80 psi)
Service Temperature	4.5° - 104° C (40° - 220° F)
Approximate Weight	Up to 76 kg (168 lbs)

GENERAL SAFETY PRECAUTIONS

⚠ CAUTION

Use appropriate guarding for moving components. Failure to guard could result in serious bodily injury.

⚠ CAUTION

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

⚠ CAUTION

Watch for sharp features when interacting with this product. The parts have complex shapes and machined edges.

⚠ WARNING

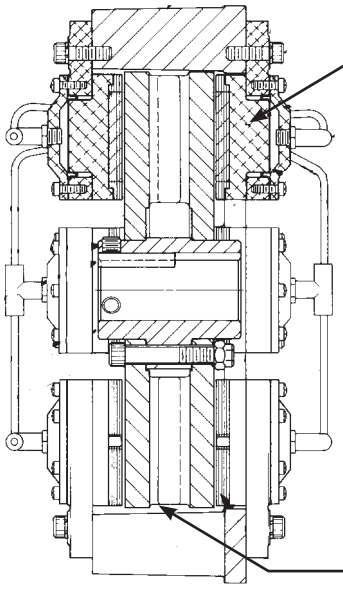
This product is capable of emitting a spark if misused, therefore is not recommended for use in any explosive environment.

⚠ CAUTION

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

⚠ WARNING

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



⚠ CAUTION

Surface temperature may exceed safe handling limits during operation. Do not touch.

⚠ CAUTION

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

INSTALLATION

NOTE

The following sections are arranged by model. Verify that you are in the correct section for your model. For the Frame Mounted TCB, see below. See the following section for Shaft Mounted TCB installation instructions.

FRAME MOUNTED TCB

REFER TO FIGURES 1-4.

1. Install Stud Bolts (Item 9) into a mounting bracket that has been machined with 3/4-10 UNC tapped holes.

   Tapped hole location requirements are:

TCB-10	2 holes @ 180° on a 12-1/8" B.C.
TCB-14	3 holes @ 120° on a 15-1/2" B.C.
TCB-20	4 holes @ 90° on a 21-9/16" B.C.

NOTE

An alternate method for mounting this unit is to secure the Stud Bolts by using angle brackets located at the proper angles.

2. Secure Stud Bolts (Item 9) using Jam Nuts (Item 10).

3. Install an Elbow Fitting (Item 15) or a Tee Fitting (Item 16) as required into each caliper half.

4. Using Lock Washers (Item 19) and Cap Screws (Item 18), secure one-half of a Caliper Assembly to the flange side of the Housing (Item 8). Tighten the Cap Screws to 7 ft-lbs [9.5 Nm] torque.

NOTE

Internal springs return the Caliper Piston to the disengaged position to guarantee clearance between Friction Facing and Rotor when no air pressure is being applied. The use of this spring is optional; the low air pressure setting is more sensitive without the springs. Refer to PARTS REPLACEMENT for spring removal.

5. Install a Jam Nut (Item 10) onto each Stud Bolt (Item 9) and place Housing (Item 8) on Stud Bolts.

NOTE

Provide a minimum clearance of 3" between both sides of Housing (Item 8) and other machine components.

6. Secure Housing (Item 8) to Stud Bolts (Item 9) with remaining Jam Nuts (Item 10).

7. Using the Machine Screw provided with each Friction Facing, secure a Friction Facing to each caliper. Tighten screws to 10-19 in-lbs [2.0-2.1 Nm].

8. Install rotor Hub (Item 1).

NOTE

See Page 4 for ROTOR HUB installation.

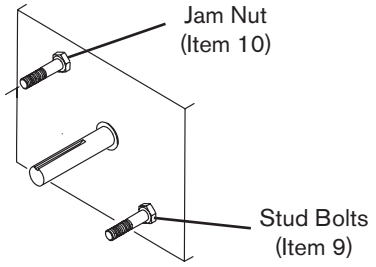


FIGURE 1

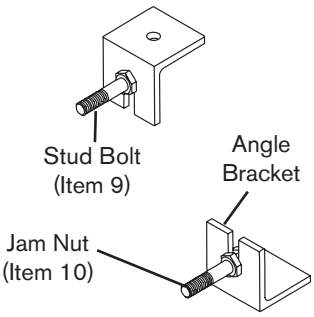


FIGURE 2

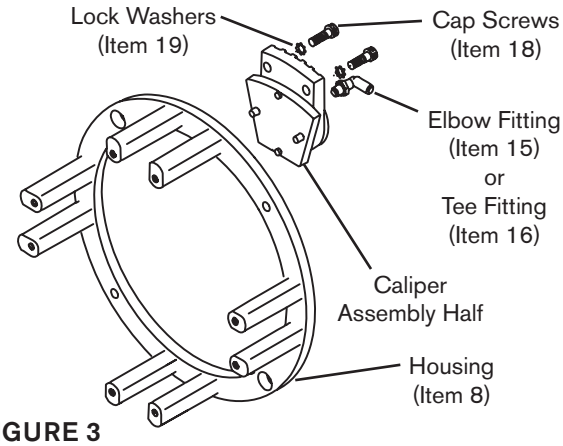


FIGURE 3

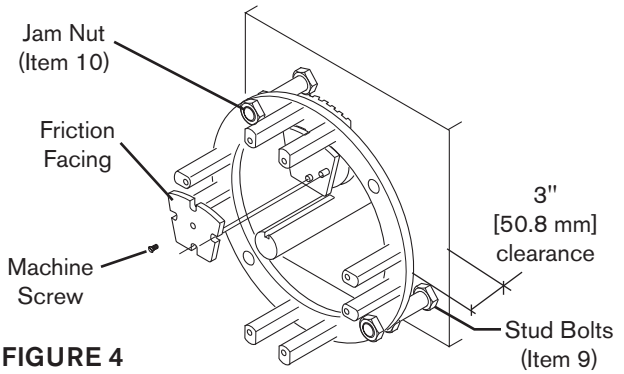


FIGURE 4

SHAFT MOUNTED TCB

REFER TO FIGURE 5.

1. Using Cap Screws (Item 36) and Lock Washers (Item 37), fasten Torque Arm (Item 32) onto Housing (Item 8).

NOTE

Use Cap Screws (Item 34) on TCB-20.

2. Using Cap Screws (Item 18) and Lock Washers (Item 19), secure one-half of a Caliper Assembly to flange side of Housing (Item 8). Tighten Cap Screws to 7 ft-lbs [9.5 Nm] torque.

NOTE

Internal springs return the Caliper Piston to the disengaged position to guarantee clearance between Friction Facing and Rotor when no air pressure is being applied. The use of this spring is optional; the low air pressure setting is more sensitive without the springs. Refer to PARTS REPLACEMENT for spring removal.

3. Install an Elbow Fitting (Item 15) or a Tee Fitting (Item 16) as required into each caliper half.

4. Slide Housing assembly onto shaft and tighten Set Screw (Item 26) to torque recommended in Table 1.

NOTE

Provide a minimum clearance of 3" [76.2 mm] between both sides of Housing and other machine components.

5. Install rotor Hub (Item 1).

NOTE

See the following section for Rotor Hub installation instructions.

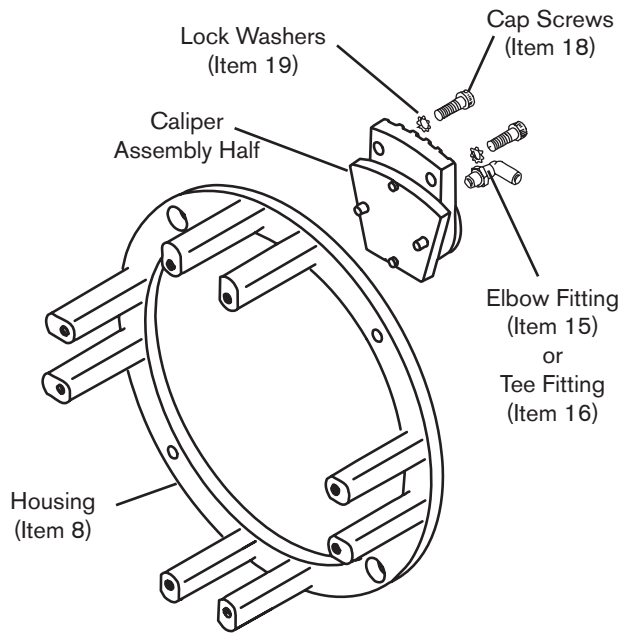


FIGURE 5

TABLE 1 Tightening Torques

Description	TCB-10	TCB-14	TCB-20
Lock Nut (Item 38)	32 ft-lbs [43.0 Nm]	32 ft-lbs [43.0 Nm]	32 ft-lbs [43.0 Nm]
Set Screw (Item 7)	23 ft-lbs [30.9 Nm]	50 ft-lbs [67.2 Nm]	166 ft-lbs [223.1 Nm]
Jam Nut (Item 10)	200 ft-lbs [268.8 Nm]	200 ft-lbs [268.8 Nm]	200 ft-lbs [268.8 Nm]
Cap Screw (Item 18)	27 ft-lbs [36.4 Nm]	27 ft-lbs [36.4 Nm]	27 ft-lbs [36.4 Nm]
Set Screw (Item 26)	23 ft-lbs [30.9 Nm]	50 ft-lbs [67.2 Nm]	166 ft-lbs [223.1 Nm

ROTOR HUB

NOTE

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

1. Insert Key (Item 6) into shaft keyway and align Hub (Item 1) keyway with shaft keyway and slide Hub Assembly (Items 1-5) onto shaft.

NOTE

Allow 1/16" [16 mm] gap between Friction Facings and Rotor Disc.

2. Tighten Set Screw (Item 7) to recommended torque (See Table 2).

TABLE 2 Tightening Torques

Description	TCB-10	TCB-14	TCB-20
Lock Nut (Item 38)	32 ft-lbs [43.0 Nm]	32 ft-lbs [43.0 Nm]	32 ft-lbs [43.0 Nm]
Set Screw (Item 7)	23 ft-lbs [30.9 Nm]	50 ft-lbs [67.2 Nm]	166 ft-lbs [223.1 Nm]
Jam Nut (Item 10)	200 ft-lbs [268.8 Nm]	200 ft-lbs [268.8 Nm]	200 ft-lbs [268.8 Nm]
Cap Screw (Item 18)	27 ft-lbs [36.4 Nm]	27 ft-lbs [36.4 Nm]	27 ft-lbs [36.4 Nm]
Set Screw (Item 26)	23 ft-lbs [30.9 Nm]	50 ft-lbs [67.2 Nm]	166 ft-lbs [223.1 Nm

Q.D. (TAPERED BORE) ROTOR HUB

⚠ CAUTION

Thoroughly inspect the tapered bore of hub and tapered surfaces of the Q.D. bushing. Remove any dirt, grease, or foreign material. Do not use lubricants for this installation.

1. Assemble Q.D. bushing into hub, aligning untapped holes of Q.D. bushing with tapered holes in hub.

2. Loosely insert pull-up bolts with Lock Washers into Q.D. bushing and hub.

NOTE

Do not use lubricants or thread locking compounds on these bolts.

3. With Key in shaft keyseat, slide the Hub Assembly (Items 1-5) onto shaft.

4. Tighten pull-up bolts alternately and evenly to recommended torque in Table 3.

NOTE

Runout is minimized if a Dial Indicator is used as the Q.D. bushing pull-up bolts are tightened. Place the contact tip of Dial Indicator on the machined surface of the Rotor to measure runout. Runout must be less than 0.015" [0.381 mm] TIR. (See Figure 6).

NOTE

Proceed with FRICTION FACING & CALIPER installation.

⚠ CAUTION

The tightening force on the pull-up bolts is multiplied several times by the wedging action of the tapered surface. If extreme tightening force is applied or if a lubricant is used, bursting pressure will be created in the splined hub. Follow recommended tightening torque listed in Table 3.

TABLE 3 Q.D. Bushing Specifications

Model	Bushing	Tightening Torque
TCB-10	JA	5 ft-lbs [6.4 Nm]
TCB-14	SK	15 ft-lbs [20.2 Nm]
TCB-20	J	135 ft-lbs [182.2 Nm]

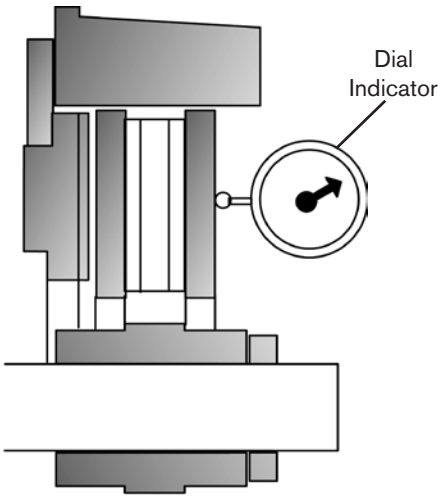


FIGURE 6

FRICTION FACING AND CALIPER

1. Using the Machine Screw (Item 10) supplied with the friction facings, secure a friction facing to each remaining caliper half. Tighten the Machine Screw to 18-19 in-lbs [2.0-2.1 Nm].

2. Using Lock Washers (Item 19) and Cap Screws (Item 18), attach caliper halves to each remaining caliper position (See Figure 7).

3. Tighten Cap Screws (Item 18) to torque recommended in Table 4.

4. Install a Tee Fitting (Item 16) or an Elbow Fitting (Item 15) into each remaining caliper.

5. Place a 1/16" [16 mm] shim between the friction facings and rotor disc, rotating the disc past each caliper and checking for equal clearance at all positions. Clearance adjustments are made by moving Jam Nuts (Item 10) on each side of housing flange. Tighten Jam Nuts (Item 10) and Set Screws (Item 26) to torque recommended in Table 4 when the clearance between the Rotor Disc and all Friction Facings is equal.

6. Using Cap Screws (Item 34) and Lock Nuts (Item 38), attach Extension Bar (Item 31) to Torque Arm (Item 32).

7. Using Lock Nut (Item 39) and Cap Screw (Item 35), attach Bracket (Item 33) to Extension Bar (Item 31).

8. Using customer supplied screws, secure Bracket (Item 33) to a firm support. Four 15/32" [11.9 mm diameter holes on 2 15/16" [74.6 mm] centers are provided in the bracket.

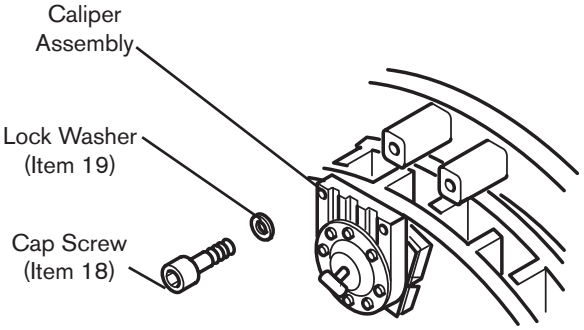


FIGURE 7

TABLE 4 Tightening Torques

Description	TCB-10	TCB-14	TCB-20
Lock Nut (Item 38)	32 ft-lbs [43.0 Nm]	32 ft-lbs [43.0 Nm]	32 ft-lbs [43.0 Nm]
Set Screw (Item 7)	23 ft-lbs [30.9 Nm]	50 ft-lbs [67.2 Nm]	166 ft-lbs [223.1 Nm]
Jam Nut (Item 10)	200 ft-lbs [268.8 Nm]	200 ft-lbs [268.8 Nm]	200 ft-lbs [268.8 Nm]
Cap Screw (Item 18)	27 ft-lbs [36.4 Nm]	27 ft-lbs [36.4 Nm]	27 ft-lbs [36.4 Nm]
Set Screw (Item 26)	23 ft-lbs [30.9 Nm]	50 ft-lbs [67.2 Nm]	166 ft-lbs [223.1 Nm

LUBRICATION

NOTE

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

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

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

Synthetic lubricants are not recommended.

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

LUBRICATOR DRIP RATE SETTINGS

⚠ CAUTION

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

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

NOTE

The caliper diaphragms of the TCB do not require lubrication. If an air line lubricator is used on the air line for the controls, the lubricant must be compatible with the silicone diaphragm.

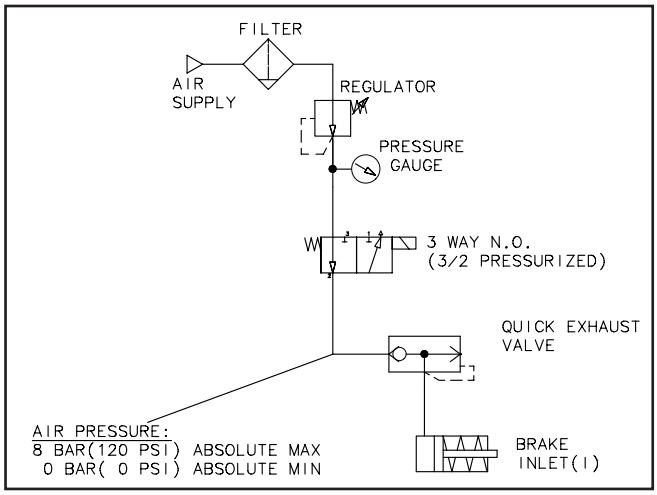
AIR CONNECTIONS

All Nexen pneumatically actuated devices require clean, dry air that meets or exceeds ISO 8573.1:2001 Class 4.4.3 to quality.

⚠ CAUTION

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

The following is a common air supply scheme used with this product. This is an example and not an all-inclusive list. All air circuits to be used with this product must be designed following ISO 4414 guidelines.



AIR CONNECTIONS continued

A length of 5/32" [4 mm] O.D. air line for connection between calipers and the air controls is supplied (See Table 5 for Air Line Specifications). Each caliper comes with one Elbow Fitting, two Tee Fittings, and 13 1/2" [342.9 mm] of air line.

NOTE

Use the length of air line supplied to make the connections between calipers.

The Elbow and Tee Fittings (Items 15 and 16) are push-lock fittings for instant connection and disconnection. To install the Air Line, simply push it into the fitting until it stops. To disconnect the Air Line, push on the fitting collar and pull the Air Line out (See Figure 8).

NOTE

Not all fittings are used for making caliper connections. Save extra fittings for use as replacement parts.

TABLE 5 Air Line Specifications

O.D.	I.D.	Min. Bend Radius	Burst Pressure	Material
0.1560" [4 mm]	0.106" [2.7 mm]	3/4" [19 mm]	1000 PSI @ 75° F	Nylon-11

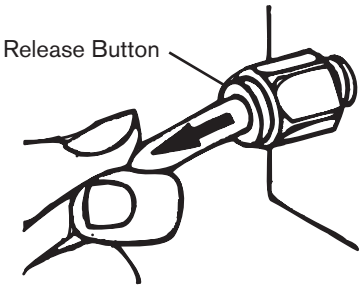


FIGURE 8

SINGLE CALIPER CONNECTION

The Single Caliper Control (Product No. 854000) directs air to a single caliper. It consists of a 3-Way, ON/OFF toggle switch, a pressure regulator, and a 5-125 psi pressure gauge (See Figure 9).

1. Install an Elbow Fitting into one caliper half and a Tee Fitting into the other half (See Figure 10).

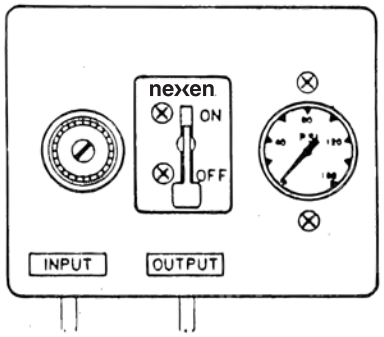
2. Connect the halves together using the 13-1/2" [342.9 mm] length of Air Line. Push one end of the tube into the elbow. Pass the other end through the 7/16" [11 mm] hole in the Housing and push it into the Tee fitting (See Figure 10).

3. Connect opposite end of the Tee Fitting to control output hose.

NOTE

Fitting (part number 2161) connects the control panel to the caliper Air Line.

4. Connect air supply to the control input and set regulator to the desired air pressure. With the toggle switch in the **ON** position, air is directed through the output to the caliper.



Single Caliper Control
Product No. 854000 and Fitting Part No. 2161

FIGURE 9

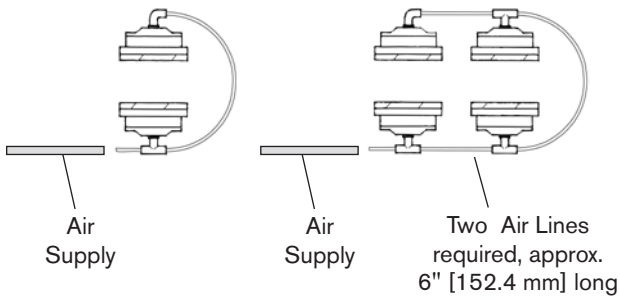


FIGURE 10

MULTIPLE CALIPER CONNECTIONS

The 3-Stage Caliper Control (Product No. 835120) directs air pressure to three separate sets of calipers connected as a single pair or a series. This provides three torque ranges with just one brake for handling a variety of web materials. It consists of a 3-Way, ON/OFF toggle switch, a pressure regulator, a 0-100 psi pressure gauge, and three rocker switch valves which allow the user to select caliper operating stages to vary torque output (See Figure 11).

Figure 12 shows typical caliper connections for the TCB-10, TCB-14, and TCB-20. The 3-Stage connections shown are examples of how calipers are arranged when controlled by the 3-Stage Caliper Control.

Any number of calipers may be used in each stage. By activating switch 1, 2, or 3, two or all three switches vary the torque output to meet a predetermined braking requirement.

1. Install a Tee Fitting into each half of one caliper (See Figure 12, Stage III for your model).

2. Connect caliper halves together using 13 1/2" [342.9 mm] length of Air Line (See Figure 12, Stage III for your model).

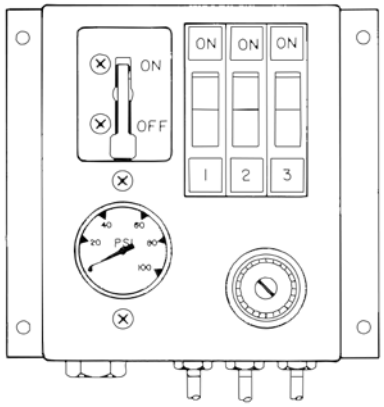
3. Install two Tee Fittings in the next set of calipers. Cut lengths of Air lines to make bridge connections between the Tee Fittings.

4. Install an Elbow and Tee Fitting into the last set of calipers. Make a bridge connection between the Tee Fittings in the previous caliper (See Figure 12, Stage III for your model).

5. Connect opposite end of Tee Fitting to 3-Stage control outlet.

6. Repeat Steps 1-5 for each set of calipers connected in series.

7. Connect air supply to control inlet port and set regulator to desired air pressure (See Figure 13).



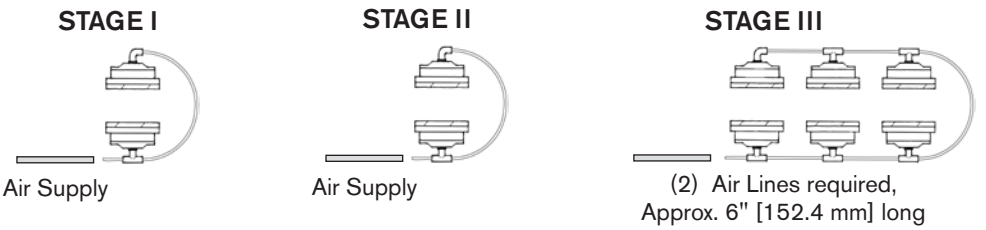
3-Stage Caliper Control, Product No. 835120

FIGURE 11

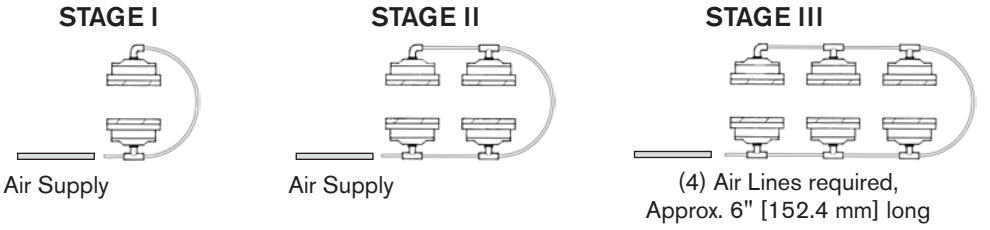
NOTE

See Figures 12 & 13 on the following page for Caliper Connections and Air Line Connections drawings.

TCB-10
FOUR POSSIBLE CALIPER CONNECTIONS



TCB-14
SIX POSSIBLE CALIPER CONNECTIONS



TCB-20
EIGHT POSSIBLE CALIPER CONNECTIONS

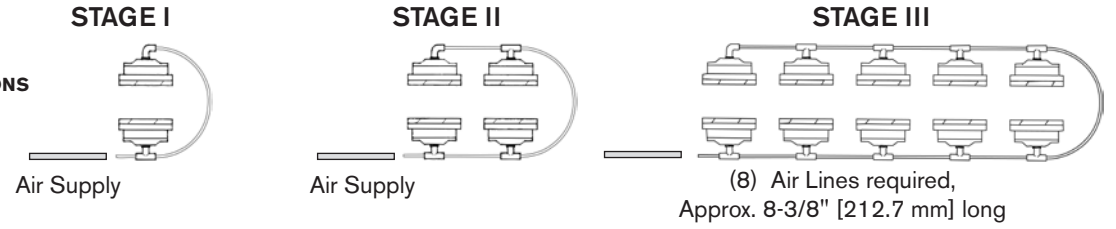


FIGURE 12

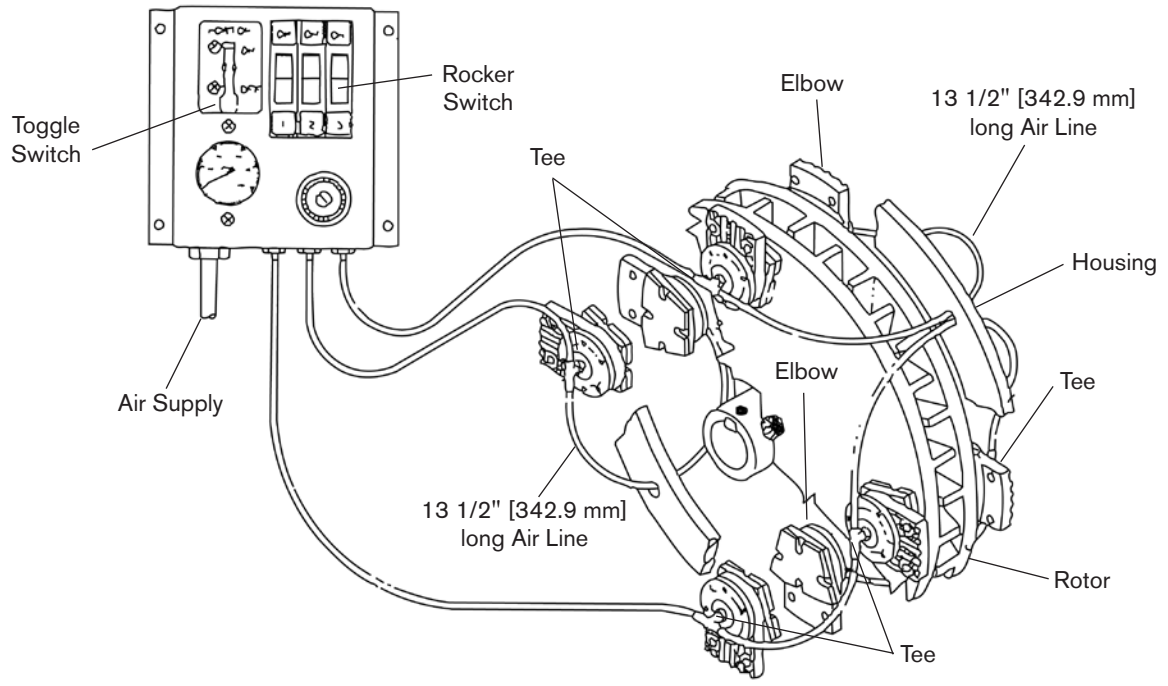


FIGURE 13 TYPICAL AIR LINE CONNECTIONS

OPERATION

The Single Caliper Control and 3-Stage Caliper Control are for manual operation.

Connect controls as close to the unit as possible for optimum response. Install an air line filter into the air line ahead of the controls.

For automatic tension control, use Nexen's Electronic Control System. Contact your Nexen distributor or representative for information concerning these products.

⚠ WARNING

Never exceed maximum recommended operating speeds specified in Table 6.

⚠ CAUTION

Before placing the TCB into service, check that all screws are tightened to the proper torque as specified in Table 7.

⚠ WARNING

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

Each TCB is provided with a wire guard ring assembly. Install guard around brake after all air line connection and fastener tightening checks have been made. Secure guard with provided fasteners.

⚠ CAUTION

Never exceed life of facing material. Facing life depends on the volume of material and the total energy over the life of the unit. Expected life (in hrs) can be found by:

$$\text{Time} = \frac{\text{Volume}}{(\text{Power} \cdot \text{Wear Rate})}$$

⚠ CAUTION

The temperature limits for this product line are 4.5° - 104° C (40°-220° F).

TABLE 6 Maximum Operating Speeds

Model	RPM
TCB-10	1500
TCB-14	1200
TCB-20	900

TABLE 7 Tightening Torques

Description	TCB-10	TCB-14	TCB-20
Lock Nut (Item 38)	32 ft-lbs [43.0 Nm]	32 ft-lbs [43.0 Nm]	32 ft-lbs [43.0 Nm]
Set Screw (Item 7)	23 ft-lbs [30.9 Nm]	50 ft-lbs [67.2 Nm]	166 ft-lbs [223.1 Nm]
Jam Nut (Item 10)	200 ft-lbs [268.8 Nm]	200 ft-lbs [268.8 Nm]	200 ft-lbs [268.8 Nm]
Cap Screw (Item 18)	27 ft-lbs [36.4 Nm]	27 ft-lbs [36.4 Nm]	27 ft-lbs [36.4 Nm]
Set Screw (Item 26)	23 ft-lbs [30.9 Nm]	50 ft-lbs [67.2 Nm]	166 ft-lbs [223.1 Nm

MAINTENANCE

Inspect all cap screws and set screws on a routine basis to make sure they are tightened to the recommended torque.

Inspect friction facings and replace them when worn to approximately 5/32" [4 mm] thick.

TROUBLESHOOTING

SYMPTOM	PROBABLE CAUSE	SOLUTION
Failure to engage.	Air not getting to the TCB due to low air pressure or a control valve malfunction.	Check for control valve malfunction or low air pressure.
Failure to disengage.	Unexhausted air due to a control valve malfunction.	Check for control valve malfunction.
Friction Facing squeal or chatter.	Air pressure too high.	Reduce air pressure.
	Wrong Friction Facing for the application.	Check the Friction Facing.
	Runout of the Hub Friction Disc is too great.	Runout of the Hub Friction Disc must be less than 0.015" [0.381 mm] TIR. If the Hub Friction Disc runout is greater than this amount it must be reinstalled.
Wobble or vibration.	Improper TCB mounting.	Check mounting and re-install the TCB if necessary.
	Faulty Shaft.	Inspect the shaft and replace it if necessary.
Noise (other than facing squeal).	Bearing failure (shaft mounted TCB only).	Check bearings.
	Loose fasteners.	Check fasteners and tighten if necessary.
	Runout of the Hub Friction Disc is too great.	Runout of the Hub Friction Disc must be less than 0.015" [0.381 mm] TIR. If the Hub Friction Disc runout is greater than this amount the Friction Disc must be reinstalled.
Loss of torque.	Air leaks or low air pressure.	Check system for air leaks and replace leaking components.
	Worn or contaminated Friction Facings.	Replace Friction Facings.
	Wrong Friction Facing for the application.	Check the Friction Facing.

FRICTION FACINGS

REFER TO FIGURE 14.

1. Stop machine and shut off air supply to the TCB.
2. Remove Cap Screws (Item 18) and Lock Washers.).
3. Remove Caliper Assembly from Housing (Item 8).
4. Remove Machine Screw (Item 10) securing friction facing to caliper and remove Facing from caliper.
5. Install new Friction Facing. Tighten screw to 18-19 in-lbs [2.0-2.1 Nm].
6. Place Caliper Assembly in position and replace Lock Washers and Cap Screws.
7. Tighten Cap Screws (Item 18) to 27 ft-lbs [36.4 Nm].

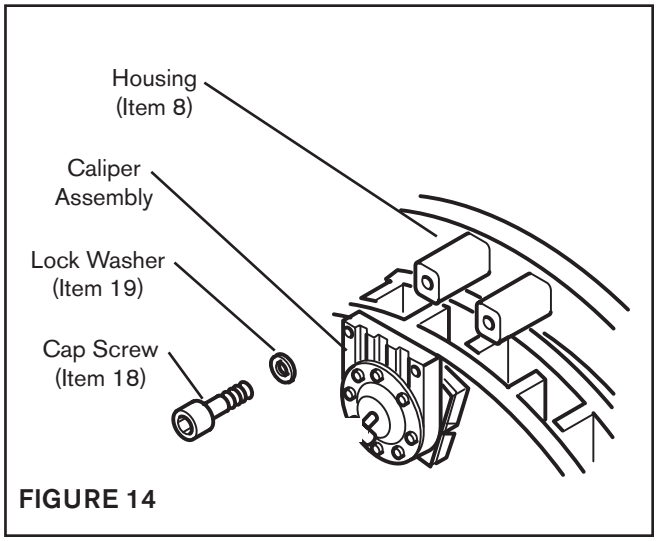


FIGURE 14

AIR LINE

REFER TO FIGURE 15.

1. To disconnect air line, push in on collar of fitting, then pull air line out of fitting.
2. To install new air line, push air line into fitting until it stops.

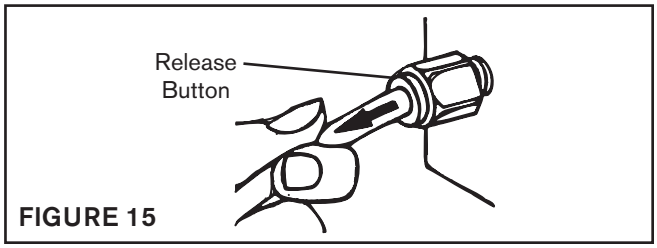


FIGURE 15

DIAPHRAGM

REFER TO FIGURE 16.

1. Disconnect air line.
2. Remove Cap Screws (Item 18) and Lock Washers.
3. Remove Caliper Assembly from Housing (Item 8).
4. Remove six Cap Screws (Item 20) and Cover (Item 13) from Cylinder (Item 11).
5. Remove Diaphragm (Item 14).

NOTE

Internal Compression Springs may also be removed at this time. These springs are optional; the low air pressure setting is more sensitive without the springs.

6. Replace the Diaphragm and reassemble the caliper.
7. Tighten the Shoulder Screw (Item 40) to 22 ft-lbs [29.6 Nm] and the Cap Screw (Item 20) to 5.5 ft-lbs [7.45 Nm] torque.

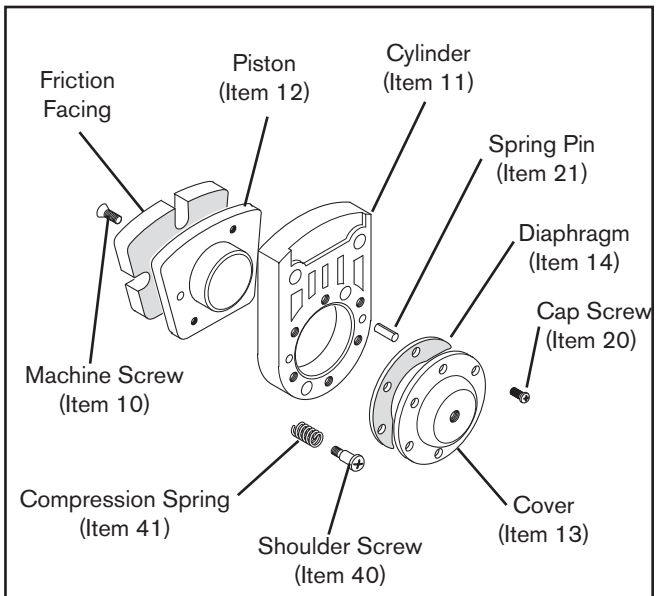


FIGURE 16

BEARINGS (SHAFT MOUNTED TCB ONLY)

REFER TO FIGURE 17.

1. Stop the machine and shut off air supply to the TCB.

2. Remove the brake by reversing the installation procedure.

NOTE

To remove the Q.D. bushing, remove the Cap Screws; then, reinsert them into the threaded holes and tighten them to push Rotor off Q.D. bushing.

3. Remove all calipers and air lines from Housing Assembly.

⚠ CAUTION

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

4. Remove the Retaining Ring (Item 24) from the Hub (Item 30).

5. Fully supporting the Housing (Item 8), press the Hub (Item 30) out of the Bearings (Item 23).

6. Using a bearing puller, remove the old Bearings (Item 23) from the Housing (Item 8).

7. Clean the bearing bore of the Housing (Item 8) with solvent, making sure all Loctite® residue is removed.

8. Apply Loctite® 680, or equivalent, to outer race of the new Bearings and press new bearings into the Housing.

NOTE

When installing new bearings, carefully align bearing O.D. with housing bore.

9. Supporting bearing's inner race, press Hub (Item 30 into Housing (Item 8).

10. Insert the Retaining Ring (Item 24).

11. Reinstall the TCB according to installation instructions.

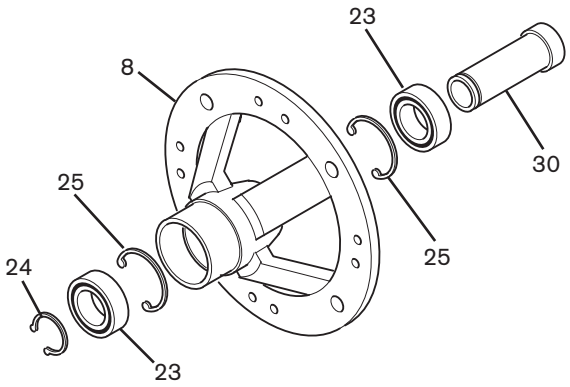


FIGURE 17

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.

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

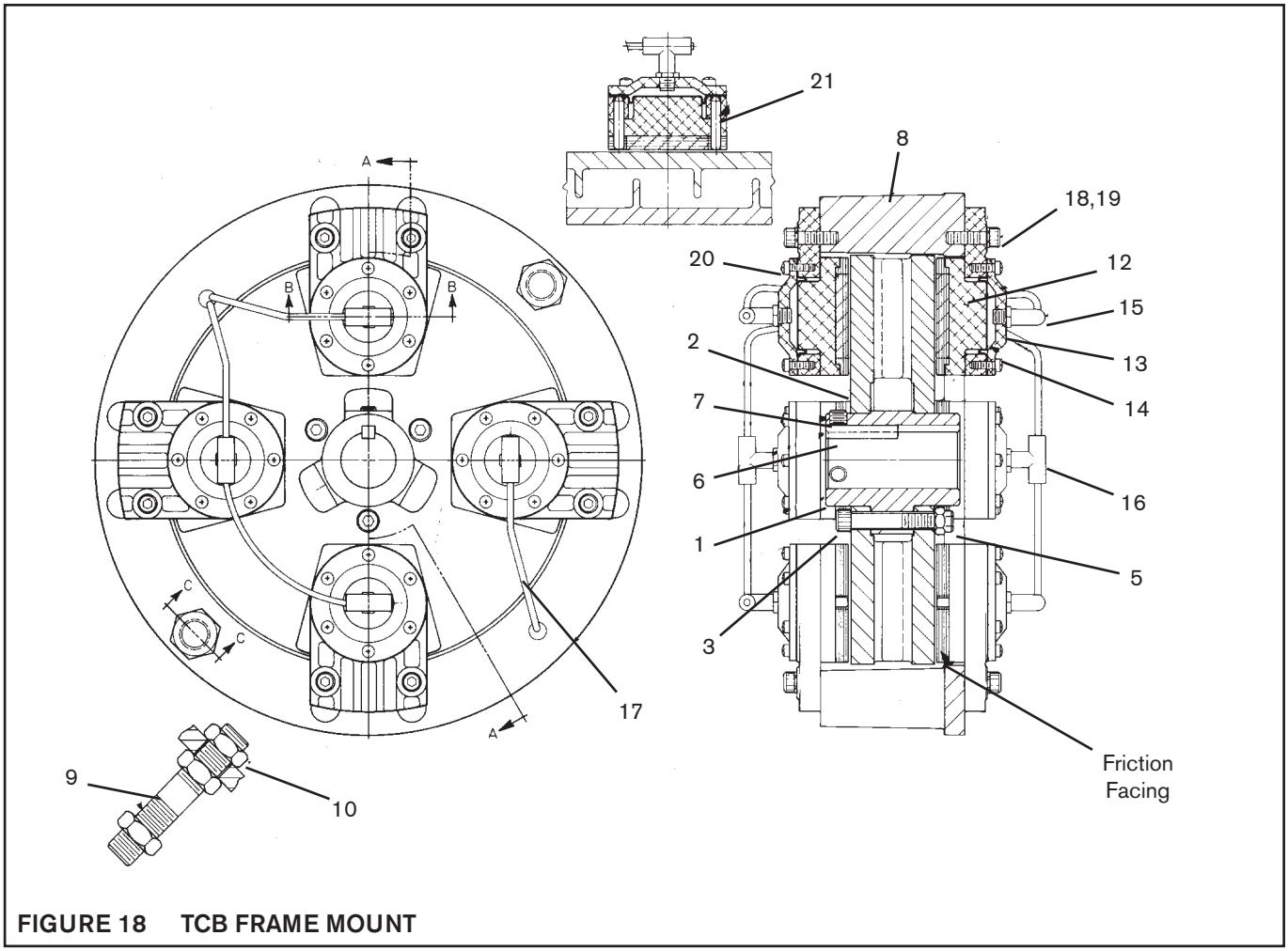


FIGURE 18 TCB FRAME MOUNT

ITEM	DESCRIPTION	QTY
1	Hub*	1
2	Rotor Disc	2
3	Cap Screw	3
5	Hex Nut	3
6	Square Key	1
7	Set Screw	2

ITEM	DESCRIPTION	QTY		
		TCB-10	TCB-14	TCB-20
8	Housing	1	1	1
9	Stud Bolt	2	3	4
10	Jam Nut	8	12	16

* Specify taper or straight bore. Give diameter of straight bore.

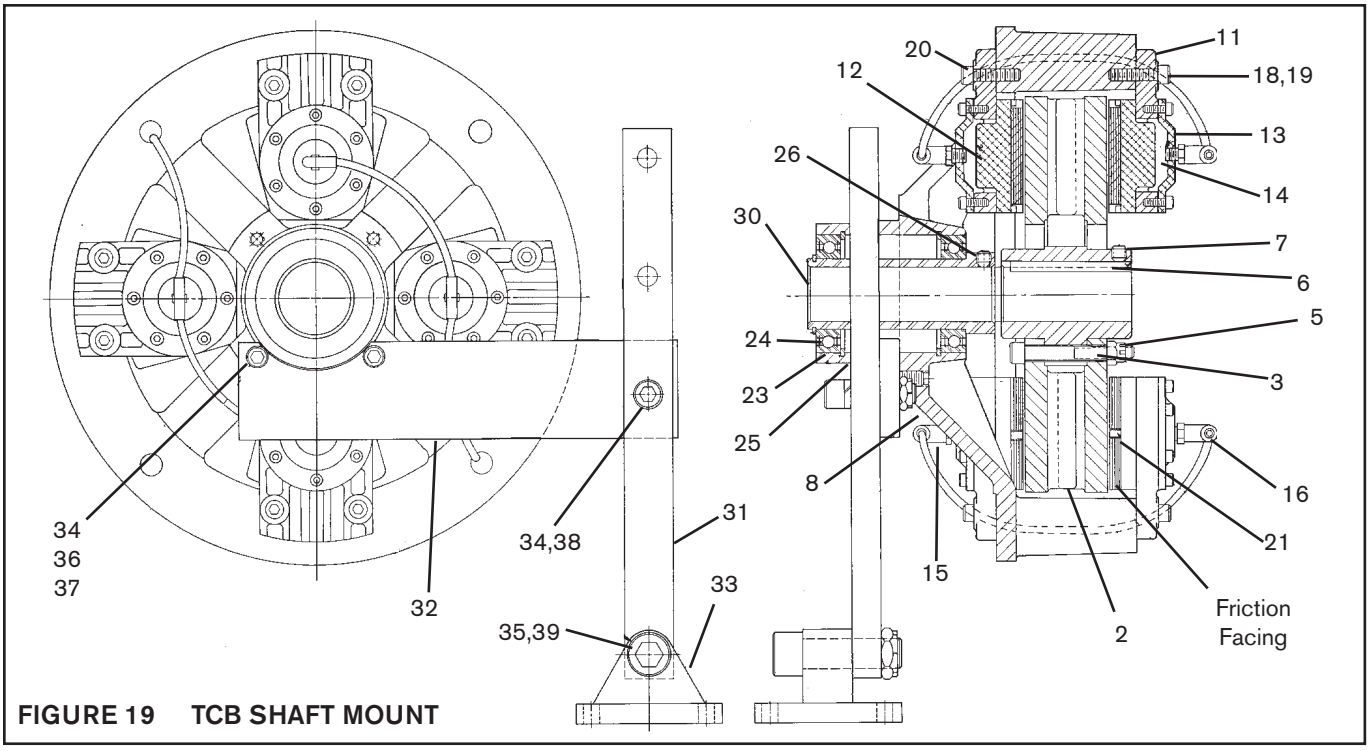


FIGURE 19 TCB SHAFT MOUNT

Housing Assembly (Shaft Mount)

ITEM	DESCRIPTION	QTY
8	Housing	1
23	Ball Bearing	2
24	Retaining Ring	1
25	Retaining Ring	2
26	Set Screw	3
30	Hub	1
31	Extension Bar	1
32	Torque Arm	1
33	Bracket	1
34	Cap Screw	3
35	Cap Screw	1
36	Cap Screw	2
37	Lock Washer	3
38	Lock Nut	1
39	Lock Nut	1

Caliper

ITEM	DESCRIPTION	QTY
10	Machine Screw	1
11	Cylinder	2
12	Piston	2
13	Cover	2
14	Diaphragm	2
15	Elbow Fitting (See Figures 18 & 19)	1
16	Tee Fitting (See Figures 18 & 19)	2
17	Air Line (See Figures 18 & 19)	**
18	Cap Screw	4
19	Lock Washer	4
20	Cap Screw	12
21	Spring Pin	4
40	Cap Screw	4
41	Compression Spring	4

** Air Line = 13 1/2 inches [342.9 mm]

Rotor Assembly

ITEM	DESCRIPTION	QTY
1	Hub *	1
2	Rotor Disc	2
3	Cap Screw	3
5	Hex Nut	3
6	Square Key	1
7	Set Screw	2

* Specify taper or straight bore. Give diameter of straight bore.

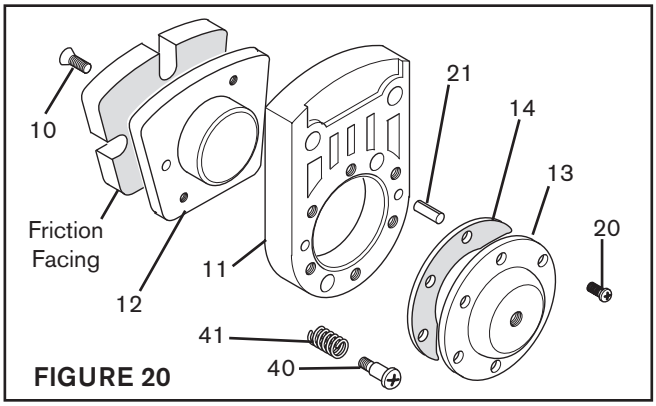


FIGURE 20

FRICTION FACING KITS

Friction facing kits contain two friction facings of the specific coefficient of friction listed below. One facing kit is required per Caliper Assembly.

NOTE

Caliper Assemblies and Friction Facing kits are common to all tension control brake models. When ordering replacements, specify one Caliper Assembly and Friction Facing.

TABLE 8

Coefficient	Description	Product Number
.20	LOCO	835113
.35	STD	835112
.45	HICO	835111

ACCESSORIES

CONTROLS

Single Caliper Control
Product number 854000
Fitting product number 002161

Three-Stage Caliper Control
Product number 835120

TABLE 9 TCB COOLING ENHANCEMENT

Model	Product Number	Qty. Required
TCB-10	835130	1
TCB-14	835130	1
TCB-20	835130	2

TABLE 10 TCB FACE GUARD

Model	Product Number	Shipping Weight
TCB-10	835106	4 lbs [1.8 Kg]
TCB-14	835107	6 lbs [2.7 Kg]
TCB-20	835108	9 lbs [4.1 Kg]

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Warranties
Nexen warrants that the Products will (a) be free from any defects in material or workmanship for a period of 12 months from the date of shipment, and (b) will meet and perform in accordance with the specifications in any engineering drawing specifically for the Product that is in Nexen's current product catalogue, or that is accessible at the Nexen website, or that is attached to this Quotation and that specifically refers to this Quotation by its number, subject in all cases to any limitations and exclusions set out in the drawing. NEXEN MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, AND ALL IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. This warranty applies only if: (a) the Product has been installed, used and maintained in accordance with any applicable Nexen installation or maintenance manual for the Product; (b) the alleged defect is not attributable to normal wear and tear; (c) the Product has not been altered, misused or used for purposes other than those for which it was intended; and (d) Buyer has given written notice of the alleged defect to Nexen, and delivered the allegedly defective Product to Nexen, within one year of the date of shipment.

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