

BD Caliper Brake

STANDARD

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



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 cause injury or death.

Comply with all applicable codes.

MEX (55) 53 63 23 31 MTY (81) 83 54 10 18
QRO (442) 1 95 72 60 ventas@industrialmagza.com



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

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INTRODUCTION

BEFORE YOU BEGIN

Nexen has introduced a new actuator for BD Caliper Brake spring-engaged models. The old Three-Port Actuator is obsolete.

The new two actuator is geometrically different and the manual disengagement mechanism operates differently. The new actuator for the 60 psi release unit is unique in look from the new two port actuator.

The redesigned two-port model has a rubber hose on the exterior of the product used for balancing internal air pressure. The service and spring ports for this model have been redesigned and simplified.

The mounting procedures on both actuators are identical.

Review the summary of actuator differences below before beginning any installation or maintenance procedures.

NOTE: The installation and maintenance procedures for each model are located next to each other in this manual. Be sure to follow the appropriate instructions for each model.

SUMMARY OF DIFFERENCES IN BD ACTUATORS

	Obsolete 3 Port Actuator	2 Port Actuator	60 PSI Release Actuator
Overall Length	214 mm [8.41 in]	169 mm [6.67 in]	165 mm [6.5 in]
Diameter	160 mm [6.31 in]	163 mm [6.44 in]	184.2 mm [7.25 in]
Clamping Force	Refer to catalog data	5% greater	Refer to catalog
Hold-Off Pressure	4.96 bar [72 psi]	5.10 bar [74 psi]	4.1 bar [60 psi]
Power Spring	Telescoping	Non-coil clash	Multiple coil
Ports	One spring release and two plugged ports	One spring release and one plugged port	One spring release and one vent port



WARNING

The user(s) of this equipment must comply with operating procedures and training of operating personnel as stated in the Occupational Safety and Health Act (OSHA) Standard (29 CFR 1910) Section 1910.219-K.

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 of 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

DISC

1. Thoroughly inspect the tapered bore of the disc hub and the tapered surface of the Q.D. bushing. Remove any dirt, grease, or foreign material from the disc hub and Q.D. bushing. Do not use lubricants for this installation.
2. Assemble the Q.D. bushing into the disc hub, aligning the untapped holes in the bushing flange with the tapped holes in the disc hub.
3. Insert the pull-up bolts and alternately and evenly tighten them to the recommended torque (See Tables 1 and 2).

NOTE: Run-out is minimized if a Dial Indicator is used as the pull-up bolts are tightened. Place the contact tip of the Dial Indicator on the machined surface of the rotor to measure Run-out. Run-out should be 2.5-3.8 mm [0.010-0.015 in] (See Figure 1).

CAUTION

If excessive tightening torque is applied, bursting pressures are created in the hub. There must be a gap between the flange of the Q.D. bushing and the disc hub to ensure a proper press fit of the Q.D. bushing onto the shaft.

4. To remove the Q.D. bushing, remove the pull-up bolts and reinsert into the threaded holes. Tighten the pull-up bolts to push the disc hub off the Q.D. bushing.

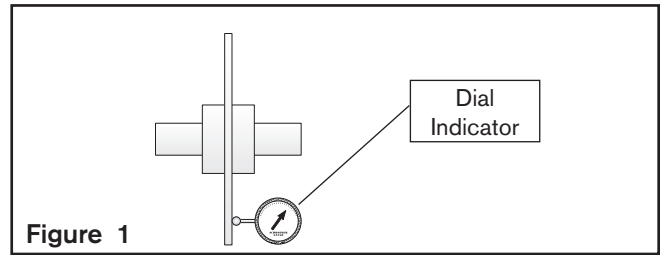


Figure 1

Table 1
Pull-up Bolt Torques For Non-Ventilated Discs

RECOMMENDED TIGHTENING TORQUES			
DIAMETER	PART NUMBER	Q.D. BUSHING	TORQUE
305 mm [12 in]	934201	SF	40.5 Nm [30 ft-lb]
356 mm [14 in]	934202	E	81 Nm [60 ft-lb]
406 mm [16 in]	934203	E	81 Nm [60 ft-lb]
457 mm [18 in]	934204	J	182.5 Nm 133 ft-lb
508 mm [20 in]	934205	J	182.5 Nm 133 ft-lb
559 mm [22 in]	934206	J	182.5 Nm 133 ft-lb
610 [24 in]	934207	J	182.5 Nm 133 ft-lb

Table 2
Pull-up Bolt Torques For Ventilated Discs

RECOMMENDED TIGHTENING TORQUES			
DIAMETER	PART NUMBER	Q.D. BUSHING	TORQUE
463.5 mm [18.25 in]	934200	J	182.5 Nm [135 ft-lb]
533 mm [21 in]	934300	J	182.5 Nm [135 ft-lb]
610 mm [24 in]	934400	J	182.5 Nm [135 ft-lb]



WARNING

Spring actuated brakes must be manually released prior to brake disassembly.

OBSELETE THREE-PORT ACTUATOR

Apply hold-off air pressure to remove tension on the Tap Bolt and use a 9/16 inch socket wrench to turn the Tap Bolt counterclockwise until the brake is released (approximately forty turns).

TWO-PORT ACTUATOR

Apply hold off pressure to remove tension on the Tap Bolt and use a 3/4 inch socket wrench to turn the Tap Bolt counter clockwise to fully cage (compress) the spring. The spring is fully compressed when the bolt is backed out of the unit 21 mm [0.83 in].

60 PSI ACTUATOR

Apply hold off pressure to remove tension on the manual release Bolt and use a 15/16 inch socket wrench to turn the Tap Bolt counter clockwise to fully cage (compress) the spring. The spring is fully compressed when the bolt is tightened until snug.

Hold-off air pressure can be removed at this time, and service performed (See Figure 2a).

The actuator can be mounted on either side of the brake.

1. Pull Shoe Pins (Item 16) up and out (See Figure 3).
2. Remove Shoes (Item 3) (See Figure 3).
3. Remove the 4 Cap Screws (Item 24) (See Figure 3).
4. Remove the Pivot Pin Retainer Plate (Item 6) (See Figure 3).
5. Press the Pivot Pins out (Item 7) (See Figure 3).
6. Slide Arms (Item 2) out of Main Frame (Item 1) (See Figure 3).
7. Position Arms and Actuator as desired.
8. Reverse the above procedure to reassemble the BD Caliper Brake.
9. Tighten the Cap Screws (Item 24) to 7-9 Nm [5-7 ft-lb] torque.

NOTE: On spring engaged BD Caliper Brakes, apply hold-off air pressure and:

Obselete Three-Port Actuator Only

Using a 9/16 inch socket, turn the top bolt clockwise until it bottoms out (approximately 40 turns), then torque the Tap Bolt to 13.5-20.2 Nm [10-15 ft-lb].

Two-Port Actuator Only

Using a 3/4 inch socket, turn the tap bolt clockwise to fully uncage (decompress the spring. The spring is fully decompressed when the hex bolt head is flush against the actuator.

60 PSI Actuator Only

Using a 15/16 inch socket, turn the manual release bolt clockwise (Approximately 12 turns) to fully uncage the spring. **Caution: Do not completely unscrew the bolt from the unit or the manual release mechanism will be disabled.**

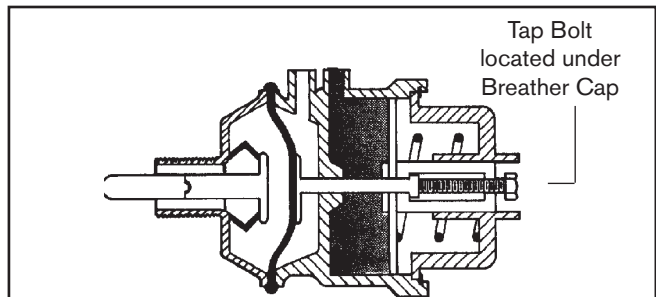


Figure 2a Obsolete Three-Port Actuator

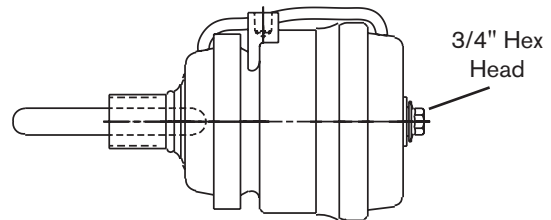


Figure 2b Two-Port Actuator

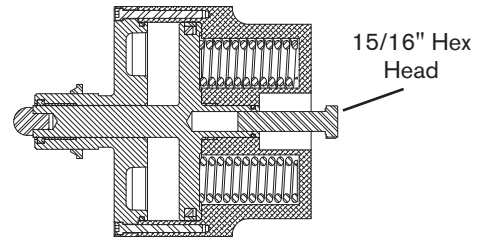


Figure 2c 60 PSI Actuator

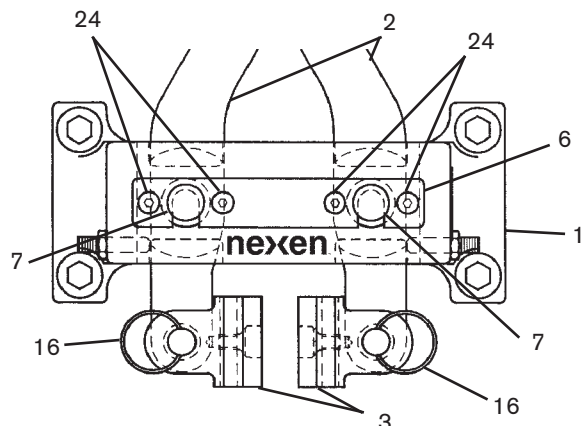


Figure 3

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MAIN FRAME (MOUNTING BRAKE TO DISC)

NOTE: Set Screws (Item 50) and Nuts (Item 51) are provided to hold Arms (Item 2) in place when the BD Caliper Brake is used on vertical shaft installations (See Figure 4).

NOTE: If the BD Caliper Brake is spring engaged, release the brake by applying 5.17-6.90 bar [75-100 psi] hold-off air pressure.

1. Locate the BD Caliper Brake in the desired position in relation to the disc.

NOTE: If the BD Caliper Brake is air engaged, apply air to the brake to lock it into position in relation to the disc. If the BD Caliper is spring engaged, release the hold-off air pressure.

2. Lock the BD Caliper Brake in position in relation to the disc.
3. Align the customer supplied support with the Main Frame (Item 1) mounting holes (See Figure 4).

NOTE: The support must be capable of sustaining loads produced during braking.

If shims are used under the Main Frame (Item 1) mounting pads, care must be taken to prevent warping of the Main Frame when tightening the Cap Screws (Item 19) (See Figure 4).

4. Release the BD Caliper Brake from the disc.
5. Tighten the Cap Screws (Item 19) to 67.8 Nm [50 ft-lb] torque (See Figure 4).

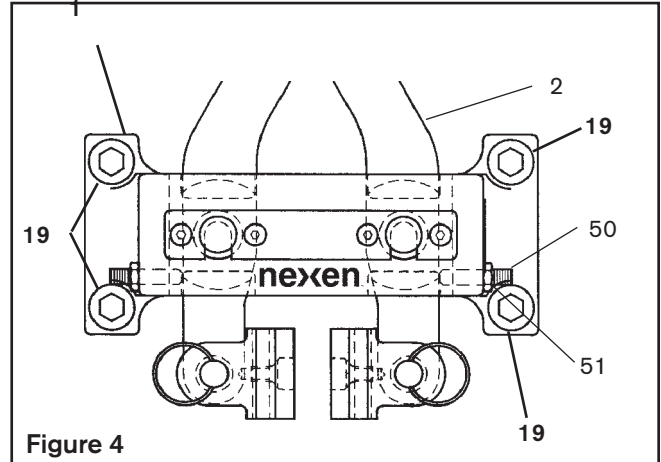


Figure 4



WARNING

The Cap Screws (Item 19) must sustain the loads produced by the braking preload produced by mounting torque. The torque rating specified above allows a significant load safety factor. Do not over torque cap screws.

FRICITION FACING CLEARANCE ADJUSTMENT

NOTE: For the Brakes listed in Table 3, the Friction Facing clearance gap has been preset at the factory for the Friction Disc width specified. The following adjustment process is necessary only if the Friction Disc being used does not have the same width as specified for the respective product that is being installed.

Table 3

PRODUCT NUMBER	FRICITION DISC WIDTH	PRODUCT NUMBER	FRICITION DISC WIDTH
933500	13 mm [0.50 in]	933594	25 mm [1.00 in]
933501	13 mm [0.50 in]	933595	25 mm [1.00 in]
933502	19 mm [0.75 in]	933600	13 mm [0.50 in]
933503	13 mm [0.50 in]	933601	13 mm [0.50 in]
933589	13 mm [0.50 in]	933602	13 mm [0.50 in]
933591	25 mm [1.00 in]	933692	13 mm [0.50 in]
933592	25 mm [1.00 in]	933693	13 mm [0.50 in]
933593	25 mm [1.00 in]	933694	13 mm [0.50 in]

AIR ACTUATED

1. Loosen adjustment screw Spanner Nut (Item 12) (See Figure 5).
2. Loosen the Adjustment Screw (Item 8) until a 1/32 inch spacer can be slid between each of the Friction Facings (Item 4) and Friction Disc (See Figure 5).
3. Turn the Adjustment Screw (Item 8) in until the spacer can be just pulled out (See Figure 5).
4. Tighten the Spanner Nut (Item 12) to 13.6-20.3 Nm [10-14 ft-lb] torque (See Figure 5).

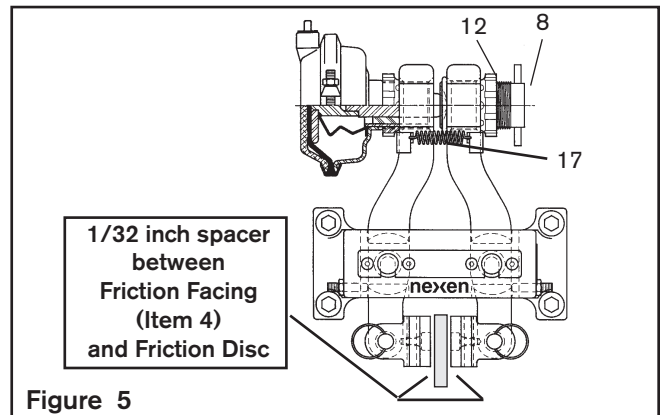


Figure 5

SPRING ACTUATED

NOTE: Friction facing adjustment on spring actuated units is accomplished while the brake is not actuated. Apply hold-off air pressure of 5.17-6.90 bar [75-100 psi] to release the spring Actuator.

1. Apply hold-off air pressure to release the spring Actuator (See Figure 6).

NOTE: Before performing step two, determine the actuator type and select either step 2a or 2b. Step four returns to general instructions used for both models.

OBsolete THREE-PORT ACTUATOR ONLY

- 2a. Using a 9/16 inch socket wrench, turn the tap bolt counterclockwise until the brake is released (approximately 40 turns). Hold-off air pressure can be removed at this time and service performed. (Refer to Figure 6a).

TWO-PORT ACTUATOR ONLY

- 2b. Using a 3/4 inch socket, turn the tap bolt counterclockwise to fully cage (compress) the spring. The spring is fully compressed when the bolt is backed out of the unit 21 mm [0.83 inches]. (Refer to Figure 6b).

60 PSI ACTUATOR ONLY

- 2c. Using a 15/16 inch socket, turn the manual release bolt counterclockwise until snug to fully cage (compress) the spring. (Refer to Figure 6c)

3. Loosen the adjustment screw Spanner Nut (Item 12) (See Figure 5).

4. Turn the Adjustment Screw (Item 8) until a 1/32 inch spacer can be slid between each of the Friction Facings (Item 4) and the Friction Disc (See Figure 5).

5. Turn the Adjustment Screw in until the spacer can just be pulled out.

6. Tighten the Spanner Nut (Item 12) to 13.6-20.3 Nm [10-15 ft-lb] torque.

NOTE: Ensure proper hold-off pressure has been maintained. (This will remove any tension on the tap bolt for easier release.)

NOTE: Before performing step seven, determine the actuator type and select either step 7a or 7b. Step eight returns to general instructions used for both models.

OBsolete THREE-PORT ACTUATOR ONLY

- 7a. Using a 3/4 inch socket, turn the top bolt clockwise until it bottoms out (approximately 40 turns), then torque the Tap Bolt to 13.5-20.2 Nm [10-15 ft-lb].

TWO-PORT ACTUATOR ONLY.

- 7b. Using a 3/4 inch socket, turn the tap bolt clockwise to fully uncage (decompress) the spring. The spring is fully decompressed when the hex bolt head is flush against the actuator.

60 PSI Actuator Only.

- 7c. Using a 15/16 inch socket, turn the manual release bolt 12 turns clockwise to fully uncage (decompress) the spring.
8. Remove hold-off air pressure to engage the spring Actuator.

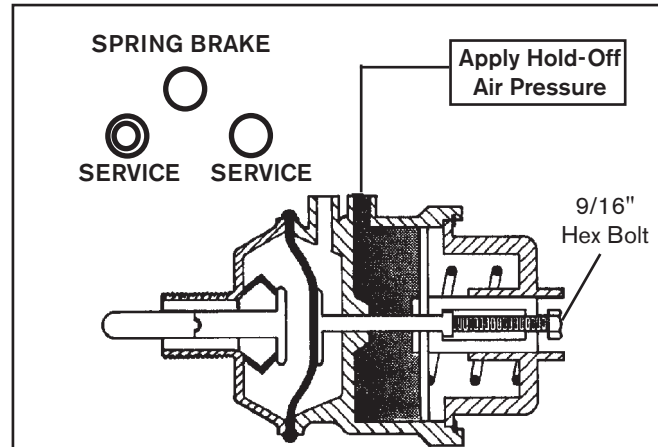


Figure 6a Obsolete Three-Port Actuator

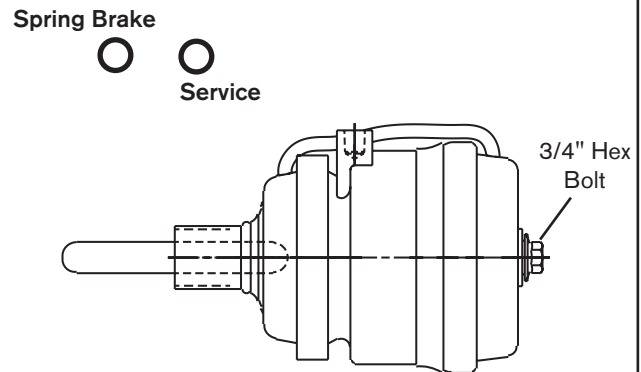


Figure 6b Two-Port Actuator

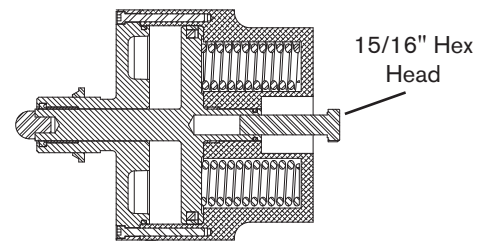


Figure 6c 60 PSI Actuator

AIR CONNECTIONS–GENERAL

NOTE: Maximum operating pressure is 6.90 bar [100 psi].

Pneumatically actuated devices require clean, pressure regulated, and lubricated air for maximum performance and long life. Your Nexen Distributor carries filters, regulators, and lubricators specifically designed to operate with Nexen clutches, brakes, and valves.

Piping diagrams are included in this manual for a variety of braking functions. Refer to OPERATIONAL MODES (See Page 6).

The actuator air connections may be rotated 360° by loosening the Ring Clamp and rotating the Actuator Head. If the actuator is spring engaged, first deactivate the brake and cage the spring.

1. Apply hold-off air pressure to release the spring Actuator (See Figure 6).

NOTE: Before performing step two, determine the actuator type and select either step 2a or 2b.

OBsolete THREE-PORT ACTUATOR ONLY

- 2a. Using a 9/16 inch socket wrench, turn the tap bolt counterclockwise until the brake is released (approximately 40 turns). Hold-off air pressure can be removed at this time and service performed.

TWO-PORT ACTUATOR ONLY

- 2b. Using a 3/4 inch socket, turn the tap bolt counterclockwise to fully cage (compress) the spring. The spring is fully compressed when the bolt is backed out of the unit 21 mm [0.83 inches].

60 PSI ACTUATOR ONLY

- 2c. The unit can be unscrewed to turn in any direction.
3. Adjust the ring clamp as required.

A Hose Assembly (Item 23) is supplied and must be connected to the brake with sufficient slack to allow the Arms (Item 2) full movement without putting stress on the hose or hose couplings.

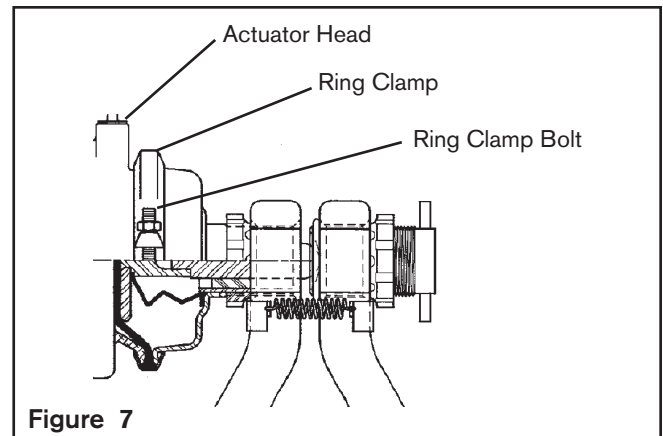


Figure 7

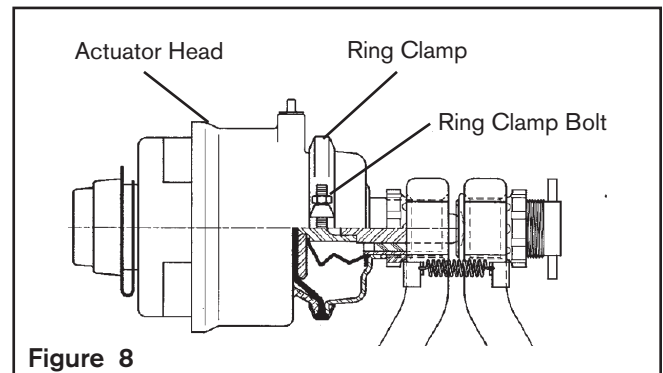


Figure 8



WARNING

Do not use rigid pipe or tubing when connecting directly to the brake. Care must also be taken to prevent an unshielded air hose from rubbing on metal surfaces or edges; this will cause rapid deterioration of the hose.

LUBRICATION

All pivot points on the BD Caliper Brake use self-lubricated high PV bearings.

For tension control applications where the disc is held at elevated temperatures for extended periods, use a light machine oil on Bearings (Items 14 and 15) (See Figure 9).

The sliding spherical contact between the Adjustment Screw (Item 8) and Piston Rod (Item 10) should be lubricated with a molybdenum disulfide based grease (See Figure 9).

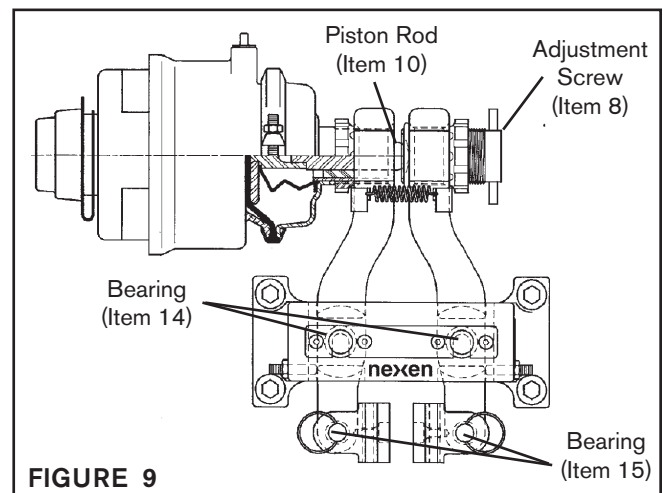


FIGURE 9

OPERATIONAL MODES

NORMAL SERVICE MODE

Below is a standard air brake control circuit. On-off air control is accomplished by the three-way valve. Torque is controlled by the regulation of air pressure (See Figure 10). **(Not applicable for the 60 PSI canister)**

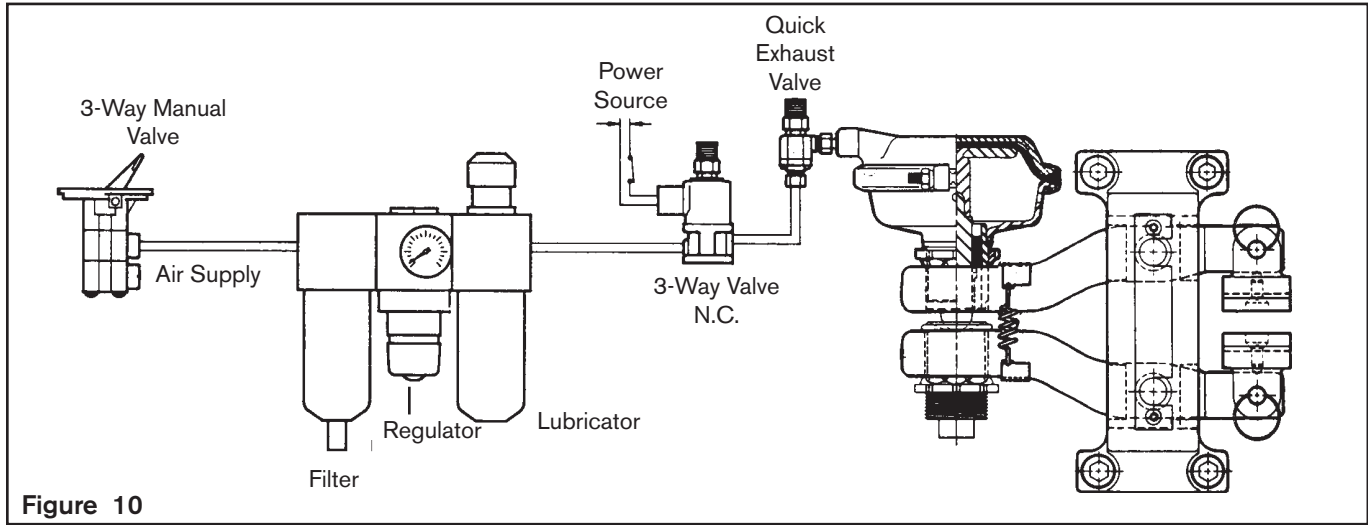


Figure 10

NORMAL SPRING ENGAGED MODE

This mode is for occasional duty, non-cyclic applications only. A hold-off air pressure of 5.17-6.90 bar [75-100 psi] is used to compress the spring inside the actuator canister. A control signal is used to release hold-off air pressure, thus applying full spring engaged torque to the disc (See Figure 11).

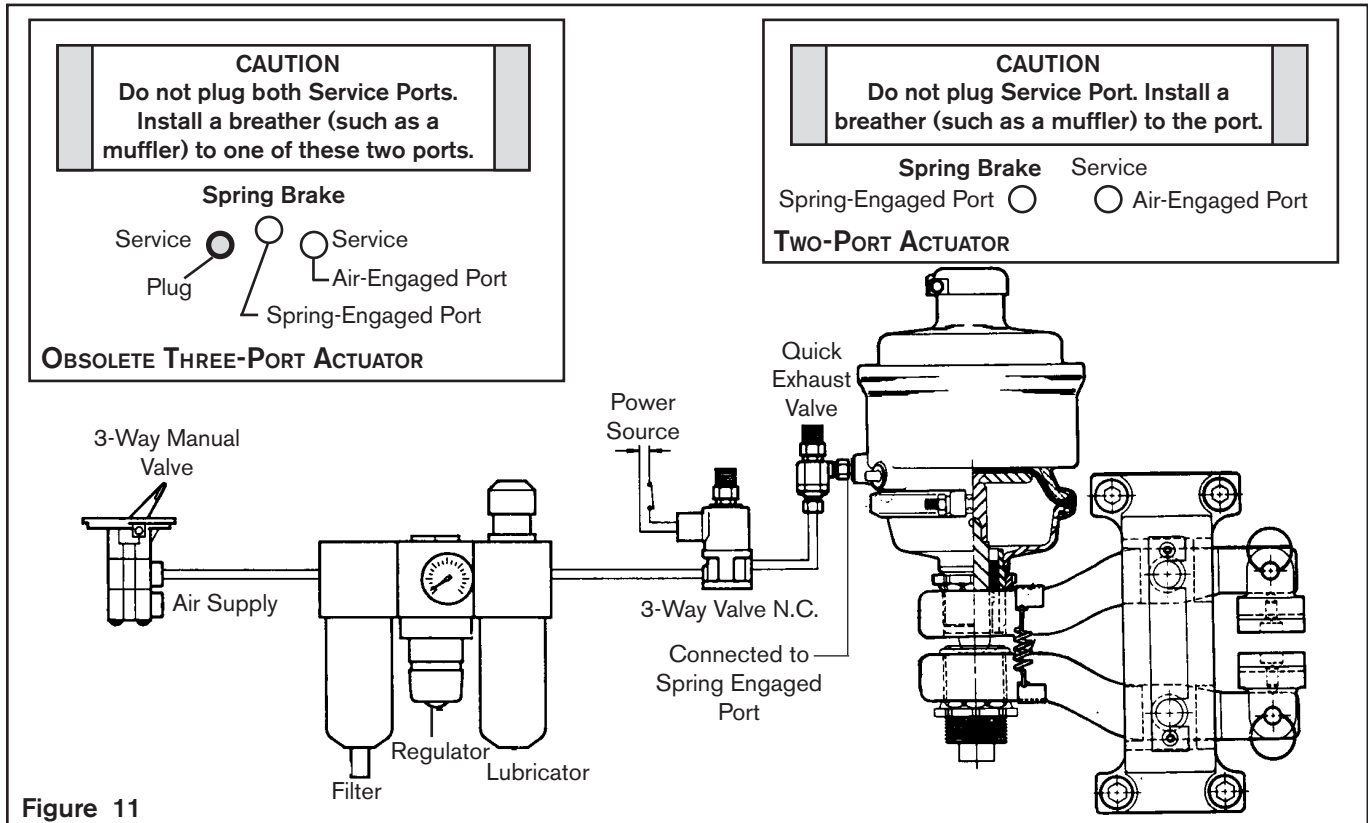


Figure 11

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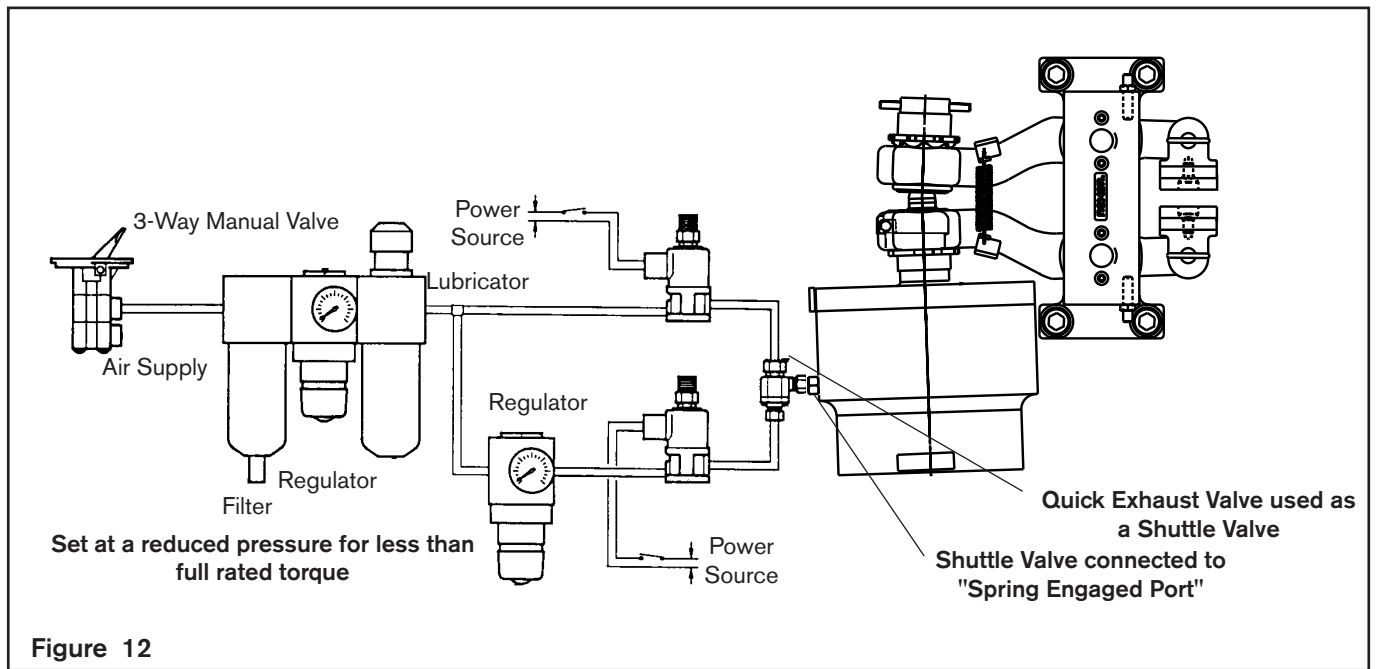


Figure 12

SPRING-ENGAGED / DUAL AIR MODE

This mode allows the selection of any value of spring engaged torque (from zero to full rated) available with a particular disc size by relieving a percentage of minimum hold-off air pressure (5.17 bar [75 psi]). The remaining pressure, balanced against the spring force, reduces the output of the Actuator (See Figure 13).

mm [24 inch] disc has a full rated spring-engaged torque of 2825 Nm [25,000 in-lb] when using the minimum hold-off air pressure of 5.17 bar [75 psi]. To achieve 60% of this torque (1694 Nm [15,000 in-lb]), relieve the hold-off air pressure 60% or 3.10 bar [45 psi], leaving 2.17 bar [30 psi] hold-off air pressure. **(Not applicable for the 60 PSI canister)**

Example: A standard spring set brake with a 610

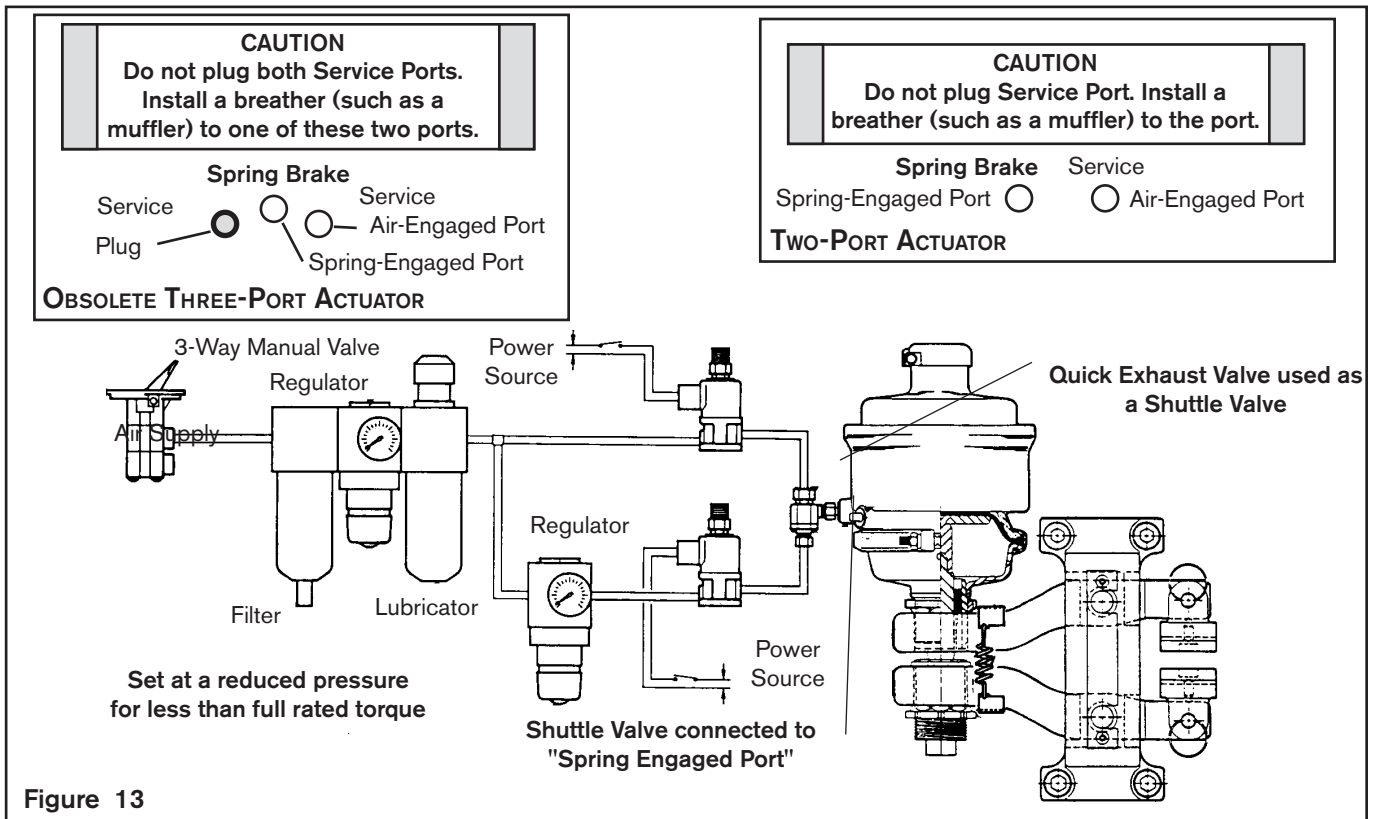


Figure 13

AIR OPERATED—SPRING ENGAGED MODE

This mode combines the Normal Service Mode and the Normal Spring Engaged Mode (See Figure 14).
(Not applicable for the 60 PSI canister)



WARNING

Applying the Normal Service Mode and the Spring Engaged Mode simultaneously is outside the normal operating range of the BD Caliper Brake. The loads produced in the Friction Facings (Item 4), Bearings (Item 14 and 15), and the machine shaft are up to twice the normal design loads.

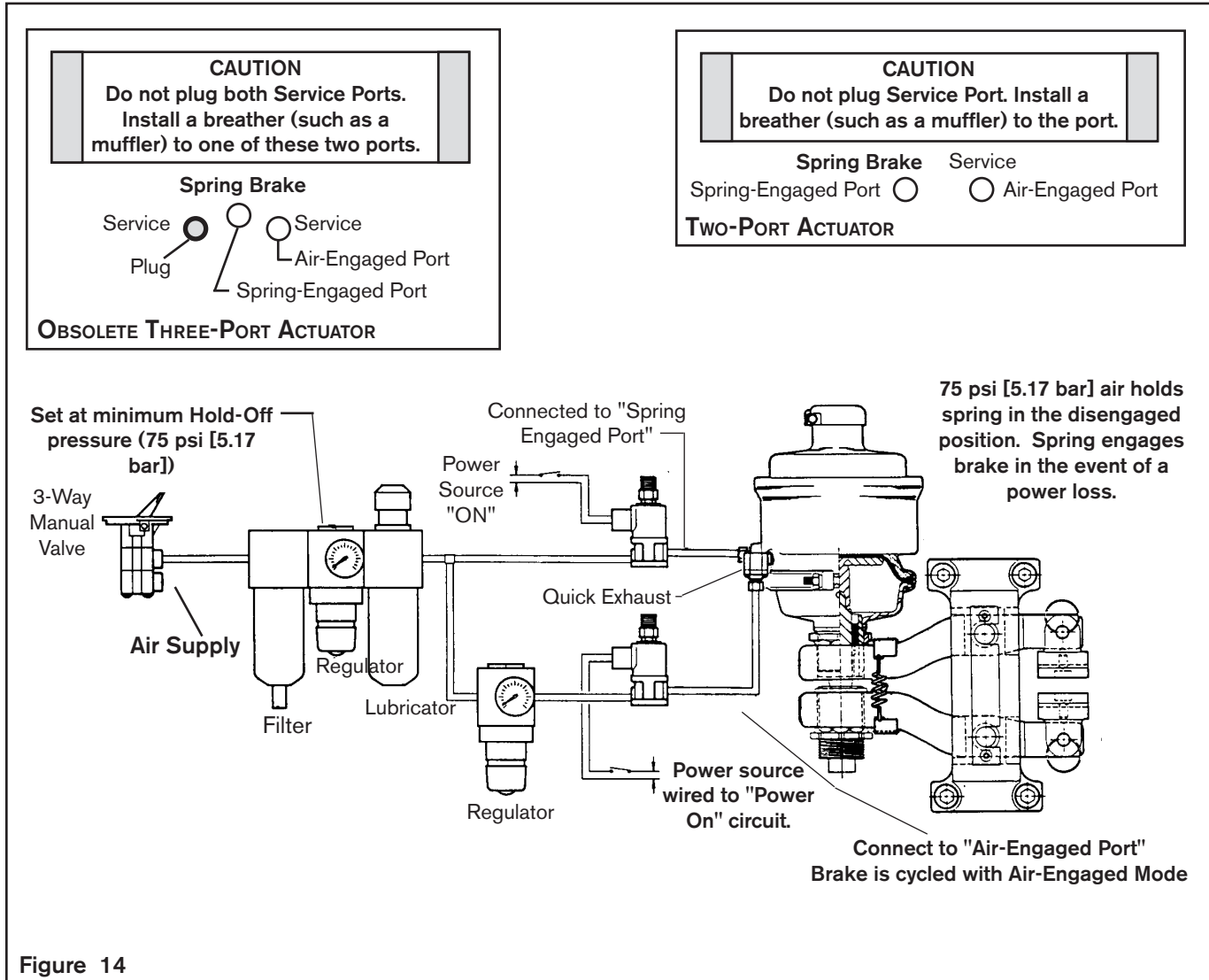


Figure 14

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OPTION KIT FOR 3/4" WIDE DISC INSTALLATION (INCLUDED WITH BRAKE)

The use of 3/4 inch wide discs with the BD Caliper Brake requires a shorter Piston Rod (Item 10) and Return Springs (Item 17) for proper operation.



WARNING

Spring actuated brakes must be manually released prior to brake disassembly.

OBSELETE THREE-PORT ACTUATOR

Apply hold-off air pressure to remove tension on the Tap Bolt and use a 9/16 inch socket wrench to turn the Tap Bolt counterclockwise until the brake is released (approximately forty turns).

TWO-PORT ACTUATOR

Apply hold off pressure to remove tension on the Tap Bolt and use a 3/4 inch socket wrench to turn the Tap Bolt counterclockwise to fully cage (compress) the spring. The spring is fully compressed when the bolt is backed out of the unit 21 mm [0.83 in].

60 PSI ACTUATOR ONLY

Using a 15/16 inch socket, turn the manual release bolt counterclockwise until snug to fully cage (compress) the spring.

Hold-off air pressure can be removed at this time, and service performed (See Figure 15 a, b & c).

1. Remove Return Spring (Item 17) and Shoes (Item 3) by removing Shoe Pins (Item 16) (See Figure 15).
2. Loosen the Spanner Nut (Item 12) and turn the Adjustment Screw (Item 8) counterclockwise until it is fully disengaged (See Figure 15).
3. Open the Arms (Item 2) at the actuator end and replace the Piston Rod (Item 10) (See Figure 17).
4. Reinstall the Shoes (Item 3), Shoe Pins (Item 16), and Return Spring (Item 17) (See Figure 15).
5. Reengage the brake.

NOTE: On spring engaged BD Caliper Brakes, apply hold-off air pressure and:

OBSELETE THREE-PORT ACTUATOR ONLY

Using a 9/16 inch socket, turn the top bolt clockwise until it bottoms out (approximately 40 turns), then torque the Tap Bolt to 13.5-20.2 Nm [10-15 ft-lb].

TWO-PORT ACTUATOR ONLY

Using a 3/4 inch socket, turn the tap bolt clockwise to fully uncage (decompress) the spring. The spring is fully decompressed when the hex bolt head is flush against actuator.

60 PSI ACTUATOR ONLY

Using a 15/16 inch socket, turn the manual release bolt 12 turns clockwise to fully uncage (decompress) the spring.

6. Perform friction facing adjustment (See FRICTION FACING CLEARANCE ADJUSTMENT).

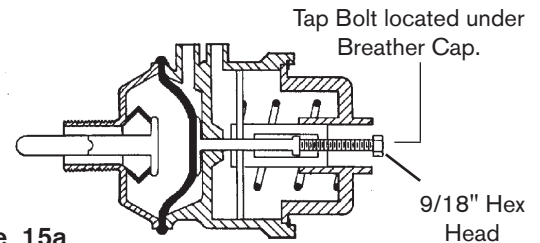


Figure 15a

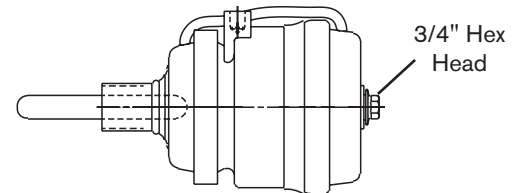


Figure 15b

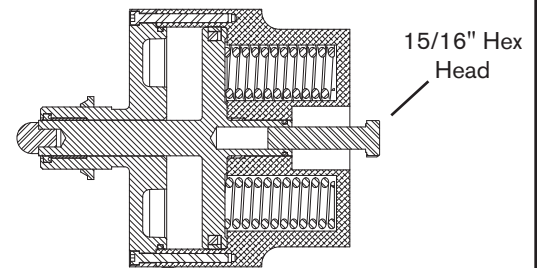


Figure 15c

MAINTENANCE

1. Adhere to the following bolt torques (See Table 4).
2. Clean Breather Cap air filter when dirty (spring engaged unit only).
3. Inspect canister exterior for damage (spring engaged unit only). Replace canister if damaged.
4. Check tightness of all air line connections and condition of all air lines. Replace air lines if deterioration exists.
5. Inspect friction facings for wear. Replace if worn to approximately 5/32 inch thick.
6. Lubricate items requiring lubrication (See LUBRICATION).

TABLE 4

ITEM	DESCRIPTION	TORQUE
24	Cap Screws	7-9 Nm [5-7 ft-lb]
--	Actuator Clamp Ring (Bolt and Nut)	33.7-47.2 Nm [25-35 ft-lb]
19	Cap Screws	67.5 Nm [50 ft-lb]
12	Spanner Nut	13.6-20.3 Nm [10-15 ft-lb]
--	Actuator Mounting Tube (Spanner Nut)	13.6-20.3 Nm [10-15 ft-lb]
--	Tap Bolt (Spring-engaged only)	13.6-20.3 Nm [10-15 ft-lb]
18	Machine Screw	12-15 Nm [8-12 ft-lb]

MAINTENANCE

OBSELETE THREE-PORT ACTUATOR ONLY

MANUAL RELEASE

NOTE: The tap bolt beneath the actuator breather cap can be used to physically release the spring in the event of actuator failure or machine service without hold off air available. **DO NOT USE THE TAP BOLT TO ADJUST THE FRICTION FACING GAP.** If the actuator (spring engaged units only) is damaged and air pressure will not release the brake, use a 9/16 inch socket wrench to turn the tap bolt counterclockwise until the brake is released (approximately 40 turns).

DISENGAGEMENT

1. If a manual release for safety reasons is needed, first apply hold off air pressure to remove any tension on the Tap bolt for easier release.
2. Using a 9/16 inch socket wrench, turn the tap bolt counterclockwise until the brake is released (approximately 40 turns) (See Figure 15a).
3. Hold off air pressure can be removed at this time and service performed.

TWO-PORT ACTUATOR ONLY

NOTE: The Hex bolt on the back of the actuator canister can be used to physically release the spring in the event of actuator failure or machine service without hold off air available. **DO NOT USE THE TAP BOLT TO ADJUST FRICTION FACING GAP.** This will lower torque capabilities. If the actuator (spring-engaged units only) is damaged and air pressure will not release the brake, use a 3/4 inch socket wrench to turn the tap bolt counterclockwise until the brake is released. The spring is fully compressed when the bolt is backed out approximately 21.1 mm [0.83 inches].

DISENGAGEMENT

1. If a manual release for safety reasons is needed, first apply hold off air pressure to remove any tension on the Tap bolt for easier release.
2. Using a 3/4 inch socket, turn the tap bolt counterclockwise to fully cage (compress) the spring. The spring is fully compressed when the bolt is backed out of the unit 21 mm [0.83 inches]. (Refer to Figure 15b).
3. Hold off air pressure can be removed at this time and service performed.

!DANGER

Actuator (spring engaged units only) is spring loaded under extreme pressure. Do not disassemble Actuator. If Actuator malfunctions, replace the Actuator or contact Nexen.



RE-ENGAGEMENT

1. To reengage the actuator, apply hold off air pressure.
2. Turn the tap bolt clockwise until seated (approximately 40 turns).
3. Torque the tap bolt to 13.6-20.34 Nm [10-15 ft-lb].
4. Remove hold off air pressure.

!DANGER

Actuator (spring engaged units only) is spring loaded under extreme pressure. Do not disassemble Actuator. If Actuator malfunctions, replace the Actuator or contact Nexen.



RE-ENGAGEMENT

1. To reengage the actuator, apply hold off air pressure.
2. Using a 3/4 inch socket, turn the tap bolt clockwise to fully uncage (decompress) the spring. The spring is fully decompressed when the hex bolt head is flush against the actuator.
3. Remove hold off air pressure.

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60 PSI ACTUATOR ONLY

NOTE: The Hex bolt on the back of the actuator canister can be used to physically release the spring in the event of actuator failure or machine service without hold off air available. **DO NOT USE THE TAP BOLT TO ADJUST FRICTION FACING GAP.** This will lower torque capabilities. If the actuator (spring-engaged units only) is damaged and air pressure will not release the brake, use a 3/4 inch socket wrench to turn the tap bolt counterclockwise until the brake is released. The spring is fully compressed when the bolt is snug.

DISENGAGEMENT

1. If a manual release for safety reasons is needed, first apply hold off air pressure to remove any tension on the Tap bolt for easier release.
2. Using a 15/16 inch socket, turn the manual release bolt counterclockwise to fully cage (compress) the spring. The spring is fully compressed when the bolt is snug (Refer to Figure 15c).
3. Hold off air pressure can be removed at this time and service performed.

PARTS REPLACEMENT

FRICTION FACINGS

NOTE: When replacing Friction Facings (Item 4), inspect the Friction Disc for scoring or grooves. If necessary, the Friction Disc may be turned. A total of 0.762 mm [0.030 in] may be removed from each side of the Friction Disc before it is necessary to replace the Friction Disc.

On spring engaged BD Caliper Brakes, apply hold-off air pressure and:

OBSOLETE THREE-PORT ACTUATOR ONLY

Using a 9/16 inch socket wrench, turn the tap bolt counterclockwise until the brake is released (approximately 40 turns). Hold-off air pressure can be removed at this time and service performed.

TWO PORT ACTUATOR ONLY

Using a 3/4 inch socket, turn the tap bolt counterclockwise to fully cage (compress) the spring. The spring is fully compressed when the bolt is backed out of the unit 21 mm [0.83 inches].

60 PSI ACTUATOR ONLY

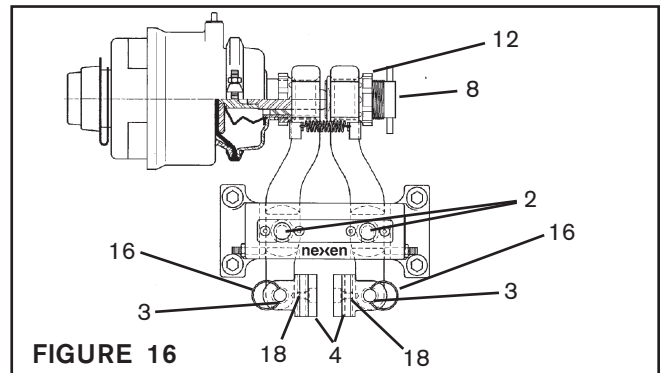
Using a 15/16 inch socket, turn the manual release bolt counterclockwise until snug to fully cage (compress) the spring.

1. Remove Shoe Pins (Item 16) to release Friction Facing Shoe Assembly (Items 3 and 4) from Arms (Item 2) (See Figure 16).
2. Remove Friction Facings (Item 4) from the Shoes (Item 3) by removing the Machine Screws (Item 18) (See Figure 15).
3. Install new Friction Facings using new Machine Screws (Item 18) (See Figure 16).
4. Tighten the Machine Screws to 12-15 Nm [8-12 ft-lb] torque.
5. Loosen adjustment screw Spanner Nut (Item 12) and back out Adjustment Screw (Item 8) until the Friction Facings (Item 4) and Shoes (Item 3) will



RE-ENGAGEMENT

1. To reengage the actuator, apply hold off air pressure.
2. Using a 15/16 inch socket, turn the manual release bolt clockwise to fully uncage (decompress) the spring. The spring is fully decompressed when the hex bolt head is flush against the actuator.
3. Remove hold off air pressure.



slide back into the Arms (Item 2) (See Figure 16).

6. Replace the Shoe Pins (Item 16) (See Figure 16).

NOTE: On spring engaged BD Caliper Brakes, apply hold-off air pressure and:

OBSOLETE THREE-PORT ACTUATOR ONLY

Using a 9/16 inch socket, turn the top bolt clockwise until it bottoms out (approximately 40 turns), then torque the Tap Bolt to 13.5-20.2 Nm [10-15 ft-lb].

TWO-PORT ACTUATOR ONLY

Using a 3/4 inch socket, turn the tap bolt clockwise to fully uncage (decompress) the spring. The spring is fully decompressed when the hex bolt head is flush against the actuator.

60 PSI Actuator Only.

Using a 15/16 inch socket, turn the manual release bolt 12 turns clockwise to fully uncage (decompress) the spring.

Remove hold-off air pressure.

7. Perform Friction Facing adjustment (See FRICTION FACING CLEARANCE ADJUSTMENT).

HIGH PV BEARINGS (ITEMS 14 AND 15)

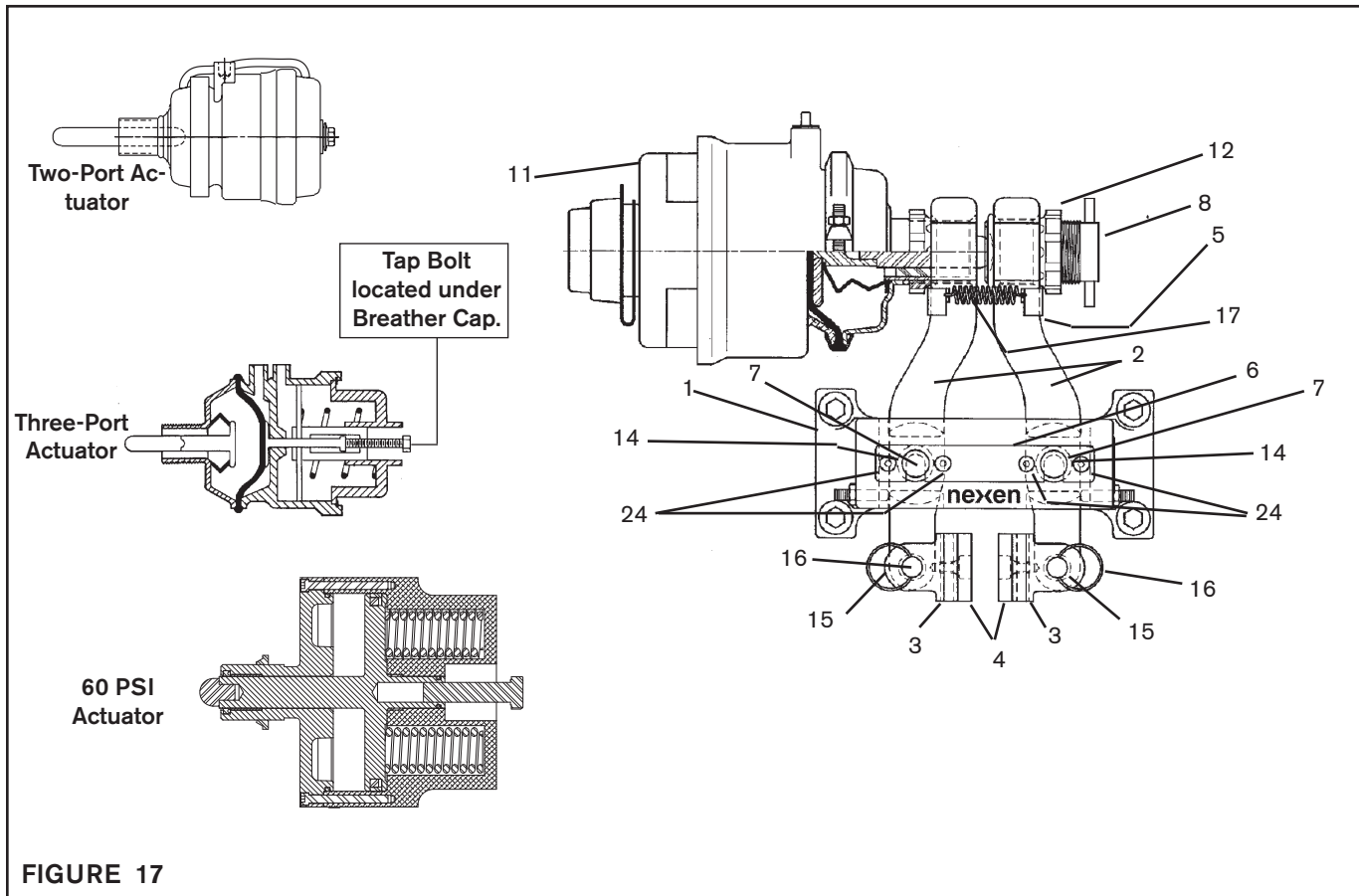


FIGURE 17



WARNING

Spring actuated brakes must be manually released prior to brake disassembly.

OBSELETE THREE-PORT ACTUATOR

Apply hold-off air pressure to remove tension on the Tap Bolt and use a 9/16 inch socket wrench to turn the Tap Bolt counterclockwise until the brake is released (approximately forty turns).

TWO-PORT ACTUATOR

Apply hold off pressure to remove tension on the Tap Bolt and use a 3/4 inch socket wrench to turn the Tap Bolt clockwise to fully cage (compress) the spring. The spring is fully compressed when the bolt is backed out of the unit 21 mm [0.83 in].

60 PSI ACTUATOR

Using a 15/16 inch socket, turn the manual release bolt counterclockwise until snug to fully cage (compress) the spring.

Hold-off air pressure can be removed at this time, and service performed (See Figure 17).

1. Loosen the Spanner Nut (Item 12) (See Figure 17).
2. Remove the Adjustment Screw (Item 8) and the Spanner Nut (Item 12) from the Arm (Item 2) (See Figure 16).
3. Remove the Actuator (Item 11) from the other Arm (Item 2) (See Figure 17).
4. Remove the Return Springs (Item 17) and Spring Retainers (Item 5) from the Arms (Item 2) (See Figure 17).
5. Remove the Shoe Pins (Item 16) from the Arms (Item 2), Friction Facings (Item 4), and Shoes (Item 3) (See Figure 17).
6. Slide the Friction Facings (Item 4) and Shoes (Item 3) off of the Arms (Item 2) (See Figure 17).
7. Remove the four Cap Screws (Item 24) securing the Pivot Pin Retainer Plate (Item 6) (See Figure 17).
8. Remove the Pivot Pin Retainer Plate (Item 6) (See Figure 17).
9. Press the Pivot Pins (Item 7) out of the BD Caliper Brake (See Figure 17).
10. Slide Arms (Item 2) out of Main Frame (Item 1) (See Figure 17).
11. Press the damaged Bearings (Item 14) out of the Main Frame (Item 1) (See Figure 17).

12. Press new Bearings (Item 14) into the Main Frame (Item 1) (See Figure 17).

NOTE: The tops of the Bearings must be flush with the top of the Main Frame (Item 1).

13. Press the damaged Bearings (Item 15) out of the Shoes (Item 3) (See Figure 17).
14. Press new Bearings (Item 15) into Shoes (Item 3) (Figure 17).
15. Slide the Arms (Item 2) back into the Main Frame (Item 1) (See Figure 17).
16. Ream the new Bearings (Items 14 and 15) to fit the Pivot Pins (Item 7) (See Figure 17).
17. Reinstall the Pivot Pins (Item 7) (See Figure 17).
18. Reinstall the Pivot Pin Retainer Plate (Item 6) (See Figure 17).
19. Reinstall the four Cap Screws (Item 24) to secure Pivot Pin Retainer Plate (Item 6) (See Figure 17).
20. Tighten the four Cap Screws (Item 24) to 0.762 mm [5-7 ft-lb] torque.
21. Slide the Friction Facings (Item 4) and Shoes (Item 3) onto the Arms (Item 2) (See Figure 17).
22. Reinstall the Shoe Pins (Item 16) (See Figure 17).
23. Reinstall the Spring Retainers (Item 5) and Return Springs (Item 17) onto the Arms (Item 2) (See Figure 17).
24. Screw the Actuator (Item 11) back onto the Arm (Item 2) (See Figure 17).
25. Screw the Adjustment Screw (Item 8) and the Spanner Nut (Item 12) onto the other Arm (Item 2) (See Figure 17).

NOTE: On spring engaged BD Caliper Brakes, apply hold-off air pressure and:

OBSOLETE THREE-PORT ACTUATOR ONLY

Using a 9/16 inch socket, turn the top bolt clockwise until it bottoms out (approximately 40 turns), then torque the Tap Bolt to 13.5-20.2 Nm [10-15 ft-lb].

TWO-PORT ACTUATOR ONLY

Using a 3/4 inch socket, turn the tap bolt clockwise to fully uncage (decompress the spring. The spring is fully decompressed when the hex bolt head is flush against the actuator.

60 PSI Actuator Only.

Using a 15/16 inch socket, turn the manual release bolt 12 turns clockwise to fully uncage (decompress) the spring.

Remove hold-off air pressure.

26. Perform Friction Facing adjustment (See FRICTION FACING CLEARANCE ADJUSTMENT).

PARTS LIST

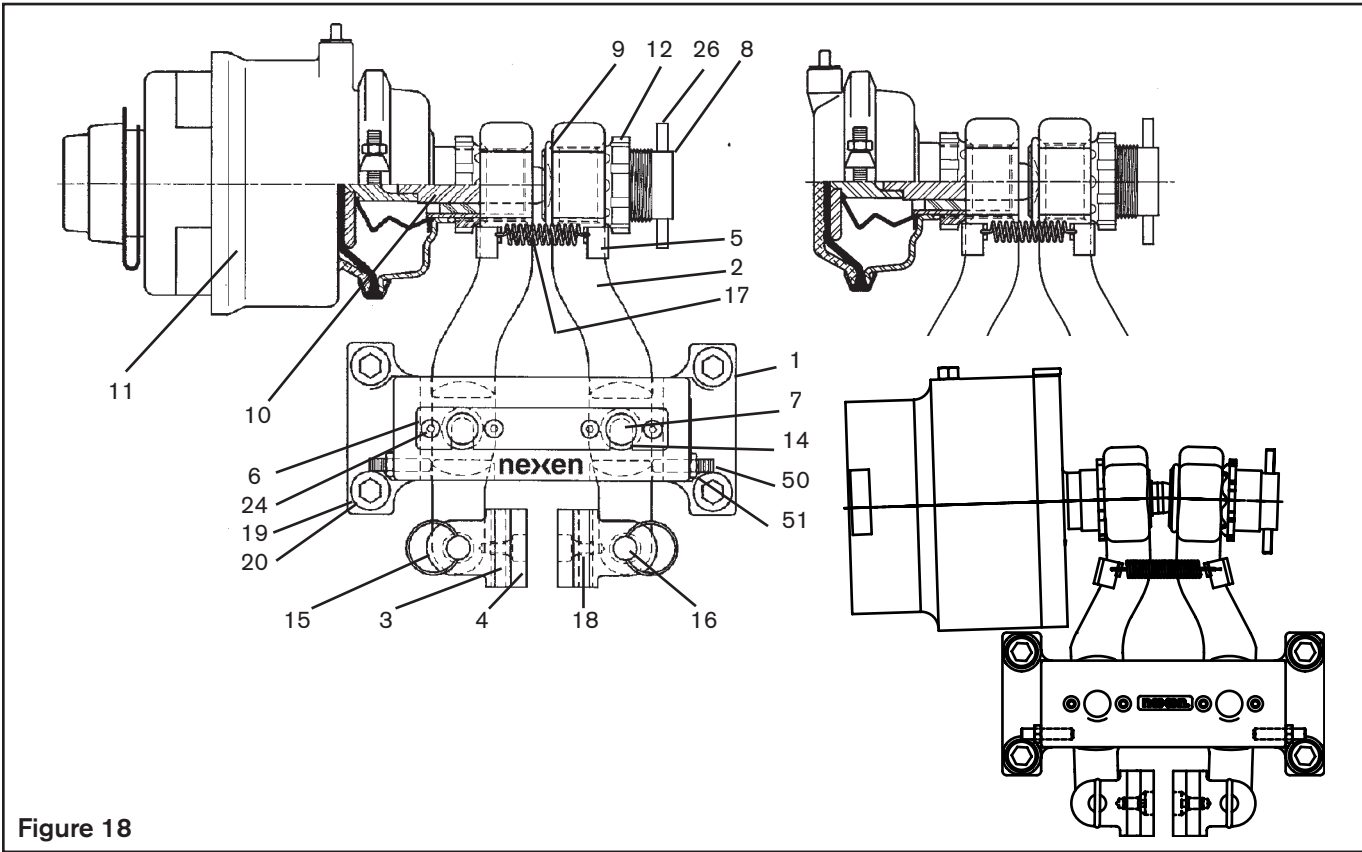


Figure 18

ITEM	DESCRIPTION	QTY
1	Main Frame	1
2	Arm	2
3	Shoe	2
4 ³	Friction Facing	4
5	Spring Retainer	2
6	Pivot Pin Retainer Plate	1
7	Pivot Pin	2
8	Adjustment Screw	1
9	Adjustment Screw Retaining Ring	1
10 ⁴	Piston Rod	1
11 ¹	Actuator Assembly	1
12	Spanner Nut	1
13 ²	Muffler (Not Shown)	1
14 ³	Bearing	4

ITEM	DESCRIPTION	QTY
15 ³	Bearing	4
16	Shoe Pin	2
17 ^{3,4}	Return Spring	2
18 ⁴	Machine Screw	4
19	Cap Screw	4
20	Lock Washer	4
21 ²	Pipe Plug (Not Shown)	*
22	Adapter (Not Shown)	*
23	Hose Assembly (Not Shown)	*
24	Cap Screw	4
25	Bushing (Not Shown)	1
26	Grooved Pin	1
50	Set Screw	2
51	Jam Nut	2

¹ Air Actuator Assembly # 10494, Spring Actuator Assembly #10493, 60 PSI Actuator #018891

³ Rebuild Kit items. Rebuild Kit Prod. No. 933900. Friction Facing Kit Prod. No. 934000. (Not used on the 60 PSI Actuator)

² Used on Air/Spring Actuated only.

⁴ 3/4" Disc option kit. Product No. 7077

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MEX (55) 53 63 23 31
QRO (442) 1 95 72 60
MTY (81) 83 54 10 18
ventas@industrialmagza.com



nexen

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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