

**CTE 8070**

# Installation, Operation and Maintenance of Airflex® CTE Brake Assemblies



**Warning**

Forward this manual to the person responsible for Installation, Operation and Maintenance of the product described herein. Without access to this information, faulty Installation, Operation or Maintenance may result in personal injury or equipment damage.



**Caution:**

**Use Only Genuine Airflex® Replacement Parts**

The Airflex Division of Eaton Corporation recommends the use of genuine Airflex replacement parts. The use of non-genuine Airflex replacement parts could result in substandard product performance, and may void your Eaton warranty. For optimum performance, contact Airflex:

In the U.S.A. and Canada: **1-800-AIRFLEX (247-3539)**

Outside the U.S.A. and Canada: **(216) 281-2211**

Internet: **www.AIRFLEX.com**

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**Eaton® Airflex® Clutches & Brakes**

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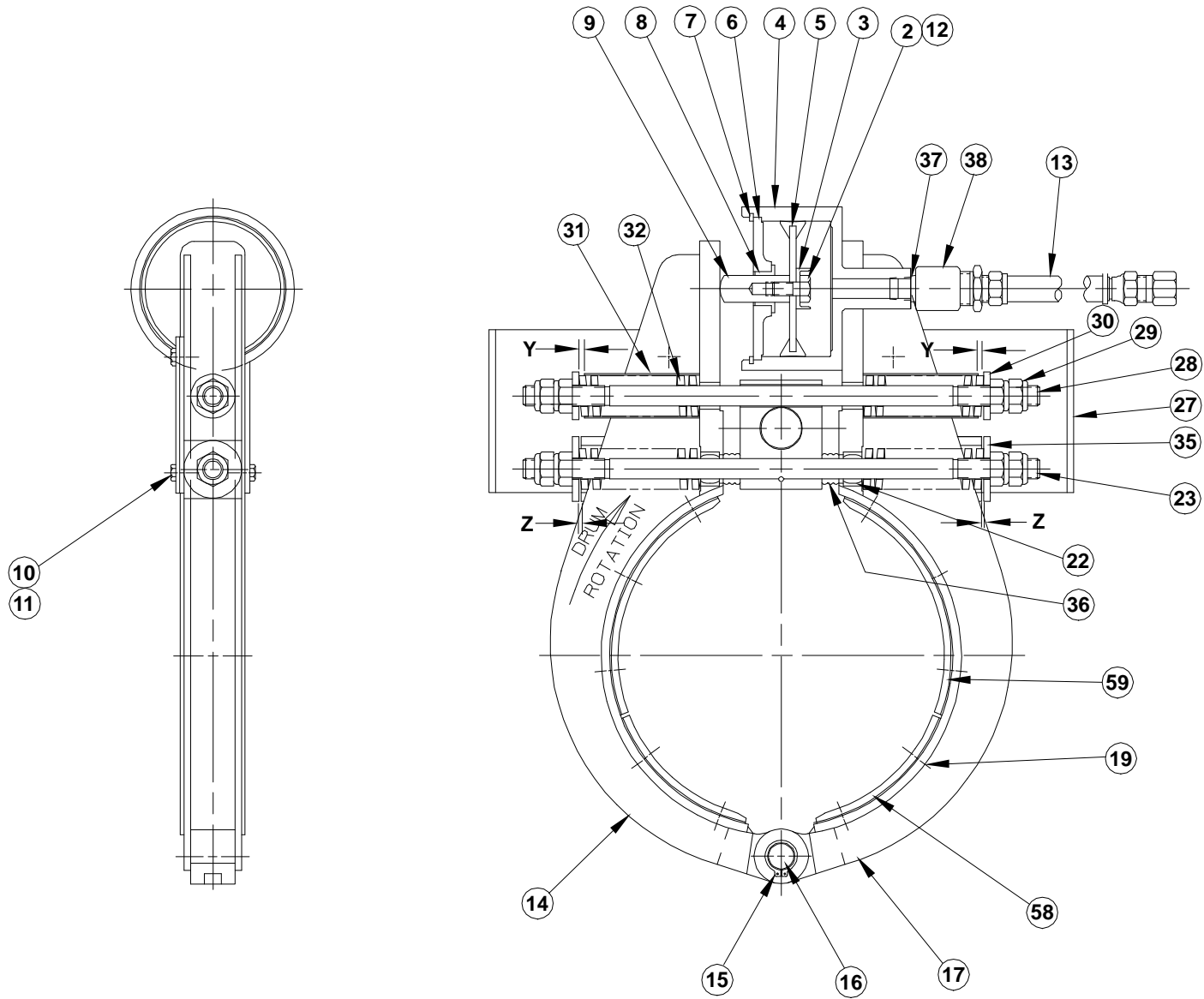
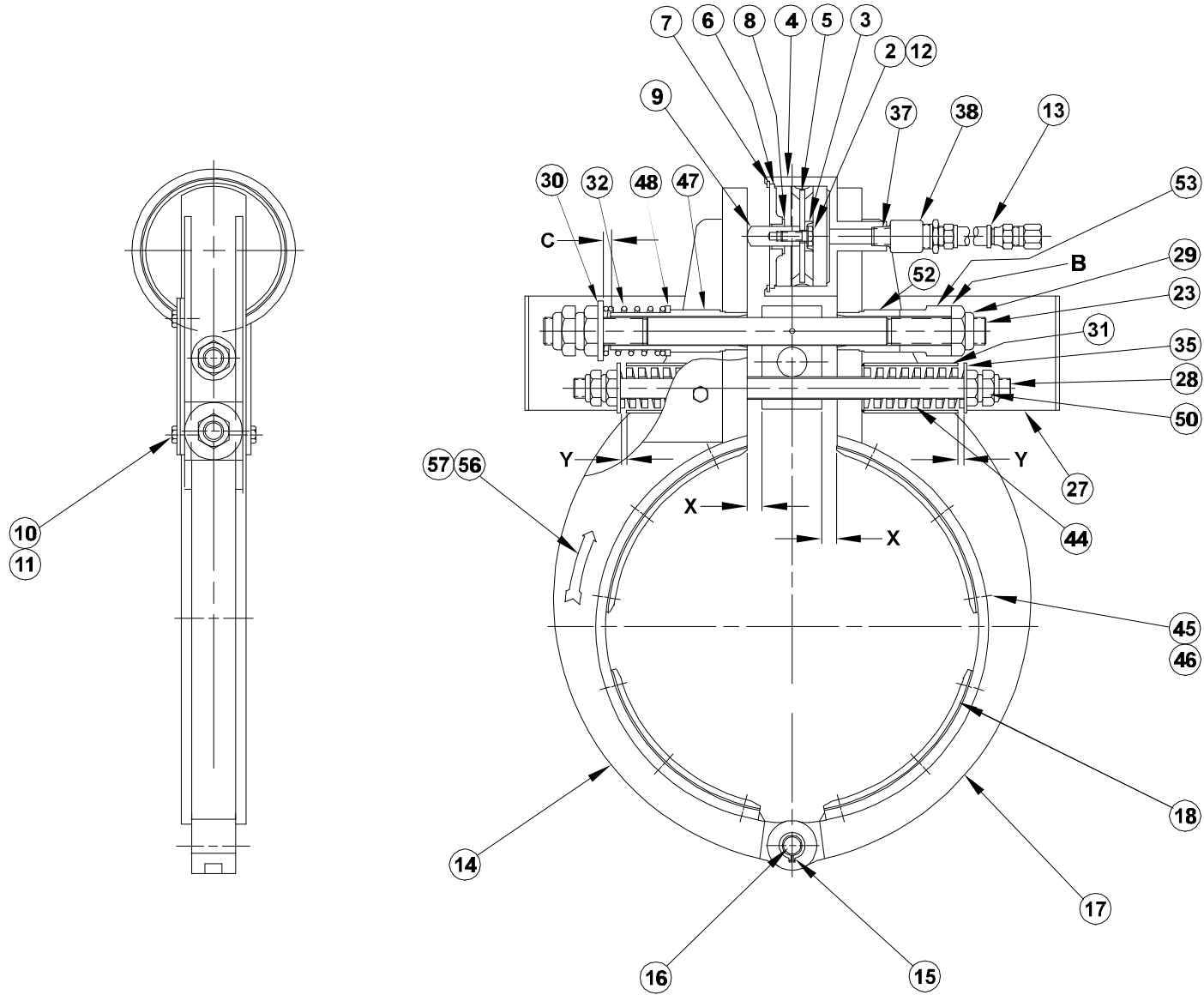
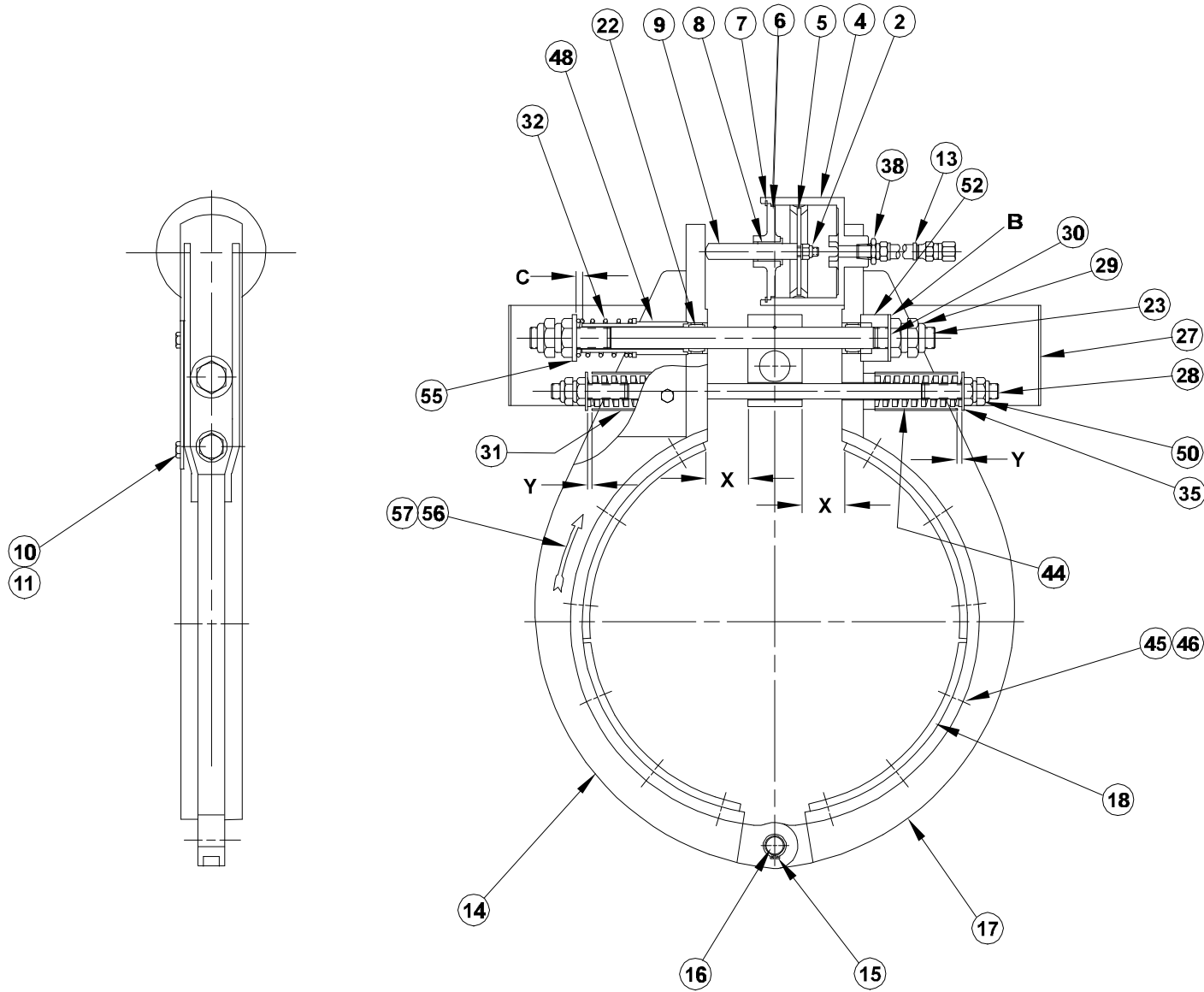


Figure 1  
12CTE237




**Figure 2**  
**18CTE300**



**Figure 3**  
**24CTE500**

## 1.0 INTRODUCTION

Throughout this manual there are a number of HAZARD WARNINGS that must be read and adhered to in order to prevent possible personal injury and/or damage to the equipment. Three signal words “DANGER”, “WARNING”, and “CAUTION” are used to indicate the severity of the hazard, and are preceded by the safety alert symbol 



**Denotes the most serious injury hazard, and is used when serious injury or death WILL result from misuse or failure to follow specific instructions.**






**Used when serious injury or death MAY result from misuse or failure to follow specific instructions.**



**Used when injury or product/equipment damage may result from misuse or failure to follow specific instructions.**

It is the responsibility and the duty of all personnel involved in the installation, operation and maintenance of the equipment on which this device is used to fully understand the

 **DANGER**,  **WARNING**, and  **CAUTION** procedures by which hazards are to be avoided.

### 1.1 Description

1.1.1 The Airflex CT brakes is spring applied and air released. It is recommended for applications requiring a brake which will engage should the supplied air pressure fail. The releasing air pressure requirement is small, making it ideal for high cyclic applications. Three brake sizes are available: 12CTE237; 18CTE300; 24CTE500.

Throughout this manual a number given in ( ) refers to the part identified in Figures 1 through 3 and Table 1.

### 1.2 How It Works

1.2.1 Refer to the brake drawings, Figures 1 through 3. The two brake shoes assemblies (14) and (17) are hinged together by a pin (16). When air

pressure is **not** applied to the cylinder (4), the springs (32, 44) force the shoes against the brake drum. The force exerted by the springs determines the torque capacity of the brake. The “braking” reaction is against the block in the trunnion sub-assembly (23) and the reaction pin. The reaction pin is mounted to a bracket which is fastened to the machine frame. The reaction pin also supports the brake assembly.

When air pressure is applied to the cylinder (4), the piston (5) and rod (9) force the shoe assemblies apart to disengage the brake.

### 1.3 Operating Conditions:

1.3.1 The minimum operating air pressure for the 12CTE237 brake is 75 psig (5.2 bar) and for both the 18CTE300 and the 24CTE500 brake it is 60 psig (4.1 bar). The maximum operating air pressure for all brakes is 110 psig (7.6 bar).

The air supplied to the brake should be clean and dry to avoid contamination of the piston and cylinder. The cylinder and piston are lubricated at the factory so no oil needs to be added. The piston is made using a BUNA-N material; therefore if any additives are used in the air supply, they must be compatible with the piston material.

1.3.2 The CTE type brakes are designed to release with a **maximum** air volume requirement given below:

12CTE237	40 in. <sup>3</sup> (0.66 dm <sup>3</sup> )
18CTE300	40 in. <sup>3</sup> (0.66 dm <sup>3</sup> )
24CTE500	100 in. <sup>3</sup> (1.64 dm <sup>3</sup> )

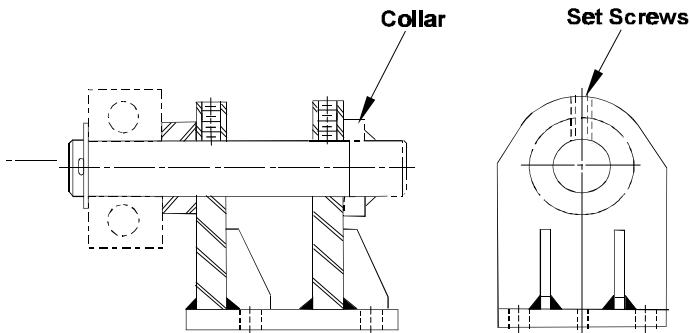
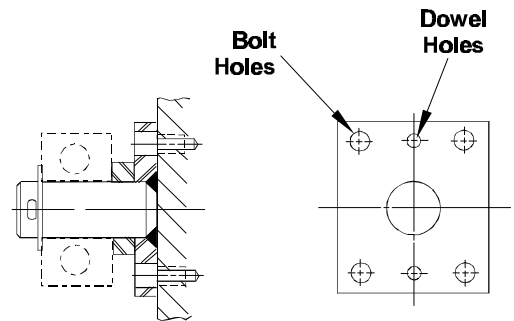
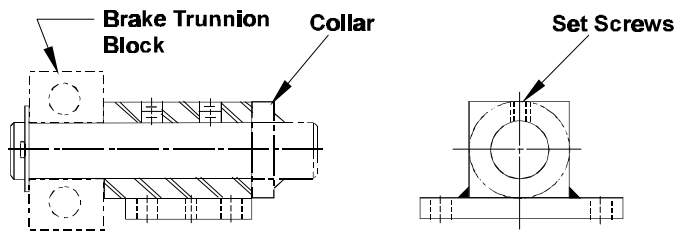
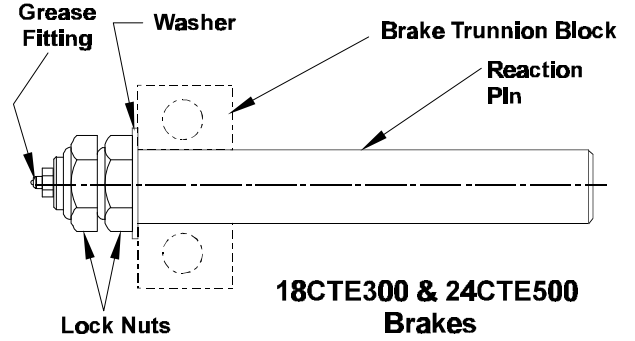
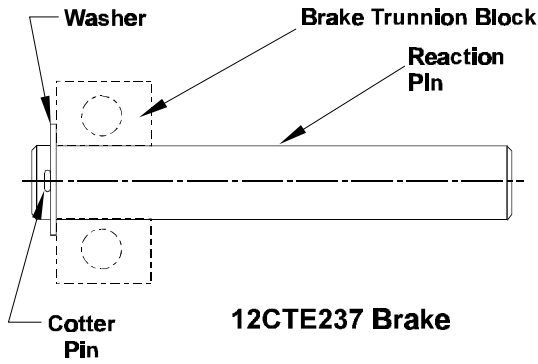


**On the spring shields (27) of each brake, there are safety and product identification decals. Do not remove, damage or paint over these decals. Replace any decal that is damaged.**

## 2.0 INSTALLATION



**It may be necessary to remove the spring shields (27) in some cases for easier installation. These shields must be replaced before operating the brake. If not done, personal injury and/or equipment damage may result.**



**NOTE:**

1. Cut reaction pin to length.
2. Locate and spot drill reaction pin for set screw or weld collars as shown.
3. Drill mounting bolt hole diameters 0.125" (3-4mm) oversize. Minimum number of bolts is 4.

Minimum recommended bolt diameters are:

Brake Size	Bolt Diameter
12CTE237	0.625" (16mm)
18CTE300	0.625" (16mm)
24CTE500	0.750" (20mm)

4. Drill and dowel bracket two places after final brake alignment.
5. Safety wire all mounting bolts.

**Figure 4**  
**Reaction Pin and Typical Brake**  
**Reaction Brackets**



### Warning:

**Before performing any work, read this manual and study the brake Figures 1 through 3. Know what needs to be done. Do not risk injury- follow the instructions.**

## 2.1 Reaction Pin and Bracket:

- 2.1.1 The brake is supported and reacted by a bracket with a steel pin which passes through the trunnion assembly (23). The 12CTE237 brake is held in position on the pin by a washer and a cotter pin, as shown in Figure 4. The 18CTE300 and 24CTE500 brakes are held in position on the pin with a double lock nut, as shown in Figure 4. The bracket, washer and cotter pin are customer supplied. The reaction pins can be supplied by Airflex.
- 2.1.2 Design, location and alignment of the reaction pin mounting is extremely important to obtain optimum brake performance.

The reaction pin mounting must be sturdy to support the brake and provide the reaction force for brake operation. Do not insert the reaction pin into a drilled hole in, or weld the pin to, the machine frame, as brake alignment would not be possible. The pin should be pressed into a bracket that has oversize mounting holes that allow for adjustment. Figure 4 illustrates typical brackets for anchoring the reaction pin to the machine frame and alternative methods for holding the pin in the bracket.

The brake should be mounted as close to the machine frame as possible to avoid a long unsupported reaction pin and yet with sufficient clearance to operate correctly.

- 2.1.3 The reaction pin must be free from nicks and burrs. The pin diameter and mating bore, for a press fit, for each brake size is given in Table 2.
- 2.1.4 Slide the reaction pin into the reaction hole in the trunnion sub-assembly (23) to check for interference. The brake must pivot freely on

the pin. Remove the pin for mounting in the bracket.

- 2.1.5 To mount the reaction pin and bracket, Table 3 gives the center-distance required from the center line of the shaft that the brake drum is mounted on, to the center of the reaction hole in the trunnion block. Mount the bracket with fasteners loose so that when the brake is installed it can be aligned. Coat the reaction pin with a National Lubricating Grease Institute (NLGI) No. 2 molybdenum disulfide grease.

Brake Size	Center Distance
12CTE237	8.375" (212.72mm)
18CTE300	13.312" (338.12mm)
24CTE500	16.526" (420.67mm)

## 2.2 Brake Mounting:



### Warning:

**The 18CTE300 and the 24CTE500 brake develop less torque if the brake drum rotates in the opposite direction from that indicated by the arrow on the brake shoe. Drum rotation must be in the direction indicated by the arrow.**



### Warning:

**Set and block the machine in a safe position to prevent hazards when installing the brake. Disconnect all electrical power before beginning the installation.**

- 2.2.1 Only the 12CTE237 brake may be mounted with the drum rotation in either direction. For the 18CTE300 and the 24CTE500, read the above **Warning**.

**TABLE 2 - Reaction Pin and Mating Hole Diameters**

Brake Size	Reaction Pin Diameter	Reaction Pin Hole Diameter
12CTE237	1.500/1.499" (38.10/38.07mm)	1.4975/1.4985" (38.04/38.06mm)
18CTE300	1.500/1.499" (38.10/38.07mm)	1.4975/1.4985" (38.04/38.06mm)
24CTE500	2.000/1.998" (50.80/50.75mm)	1.9965/1.9975" (50.71/50.73mm)



2.2.2 For applications where the brake drum is overhung on the end of the shaft, proceed to 2.2.3. For applications where the brake drum is mounted on the shaft that is already installed in place, proceed to 2.2.4.

2.2.3 For a shaft end mounted brake drum, apply air pressure (refer to 1.3) to the brake cylinder (4) through the hose assembly (13) to open the brake. With air pressure applied and the brake open, slide the brake onto the brake drum and reaction pin. Keep in mind that for brake sizes 18TE300 and 24CTE500 drum rotation direction is critical (read the **Warning** under 2.2). The direction of drum rotation must match the arrow on the brake shoe (14). For the 12CTE237 brake, install the reaction pin, washer and cotter pin to position the brake. For the 18CTE300 or the 24CTE500 brakes, install the reaction pin, washer and double stop nut to position the brake. Release the air pressure and proceed to 2.3 for brake alignment and 3.2 for adjustment.

2.2.4 For a brake drum installed on a shaft that is already mounted between bearings, the brake can be partially disassembled in order to install it. Proceed as follows:



**Warning:**

**Do not apply air pressure to the release cylinder (4) during brake disassembly. Failure to release the air pressure could result in personal injury and/or damage to the machine.**

2.2.4.1 With air released from cylinder (4), remove hex head screws (10), lockwashers (11) and both spring shields (27).

2.2.4.2 On both sides of the brake, carefully remove the stop nuts (29, 50) and washers (30, 35, 55), where used, from both rods (24, 28). Remove the spring tube (31) from rod (28) and springs (32, 44) from both rods. Spring rod (28) is free to rotate, therefore, hold the stop nuts at the opposite end of the rod with a wrench.

2.2.4.3 At the pin (16), remove one snap ring (15) and remove the pin.

2.2.4.4 Carefully withdraw the brake shoes (14 and 17) from the spring rods.

2.2.4.5 Inspect the unthreaded portions of the spring rods (24, 28) for burrs, metal chips or any abrasive particles and remove.



**Warning:**

**The presence of burrs, metal chips or abrasive particles on the spring rods (24,28) will affect the operation of the brake and may cause personal injury and/or damage to the machine.**

2.2.4.6 Apply a coating of an NLGI No. 2 molybdenum disulfide grease to the unthreaded portions of the spring rods (24,28).

2.2.4.7 Slide the trunnion block (25) of the trunnion subassembly (23) onto the reaction pin. For a 12CTE237 brake, install the reaction pin, washer, and cotter pin to hold the brake in position when reassembled. For an 18CTE300 or 24CTE500 brake, install the reaction pin washer and two stop nuts to hold the brake in position when reassembled.

2.2.4.8 Coat pin (16) with an NLGI No. 2 molybdenum disulfide grease and reassemble the brake in the reverse order of 2.2.4.2 through 2.2.4.4.

2.2.4.9 Adjust the brake according to the instructions given under 3.2.

2.2.4.10 Reinstall the spring shields (27), washers (11) and hex head cap screws (10).



### Warning:

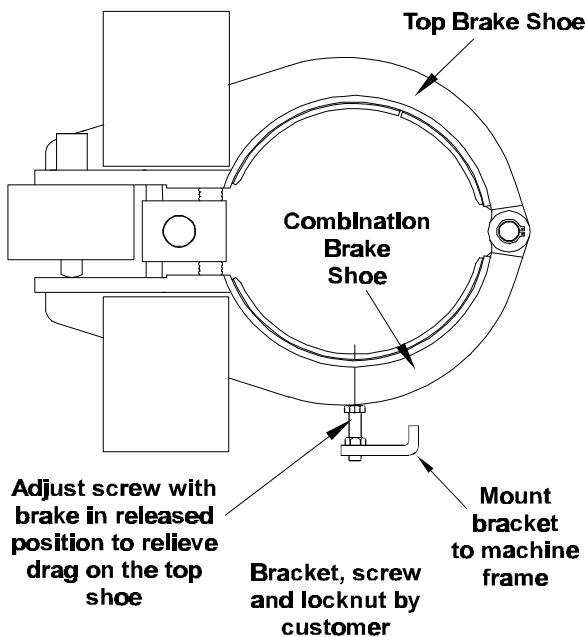
**Spring shields (27) must be reinstalled before operating the brake. If the spring shields are not replaced, the spring or spring rod may fail which could result in personal injury.**

- 2.2.4.11 Align the brake according to instructions given in 2.3.
- 2.2.5 If an off-balance mounting, as shown in Figure 5 is used, the top brake shoe may ride on the top of the brake drum when the brake is in the released position. This condition must be avoided. To alleviate this condition, an "L" shaped bracket with a hex head cap screw and locking nut can be mounted under the combination cylinder (4) and brake shoe (17) to ensure top shoe separation from the drum when the brake is in the released position. Also read 2.2.1.



### Warning:

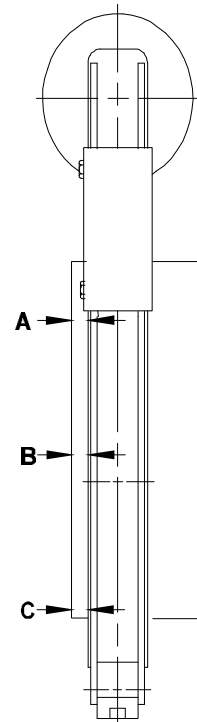
**Set and block the machine in a safe position to prevent hazards when installing the brake. Disconnect all electrical power before beginning the installation.**



**Figure 5  
Typical Off-Balance Brake Mounting**

## 2.3 Brake Alignment

- 2.3.1 With the brake clamped around the drum (normal spring-set brake clamping action), loosen bolts holding bracket to the machine frame.
- 2.3.2 Apply and release the air pressure to the brake to open and close the brake shoes. Observe dimensions A, B and C, as shown in Figure 6. Dimensions A, B, and C should be identical top to bottom, as well as front to back, with the brake either engaged or released.
- 2.3.3 If the brake has a twisting or cocking motion when it releases or engages, this indicates misalignment and should be corrected by shimming or shifting the reaction pin bracket for proper alignment of the brake to the drum.
- 2.3.4 After a satisfactory location has been established, with proper running clearances assured, tighten and safety wire screws, and anchor the reaction pin bracket by doweling to eliminate any possibility of movement.



**Figure 6  
Brake Alignment**

## 2.4 Air Piping

- 2.4.1 Pneumatic piping should be free of foreign material such as pipe thread sealer, metal chips, etc. Pipe ends must be reamed after cutting to prevent reduction of effective pipe diameter. Use 1/2" pipe for all CTE brakes. Use minimum length of piping between the solenoid air valve and the brake. Excessive piping and other restriction will slow down the response time of the brake. A flexible hose (13), to allow freedom of movement, must be installed between the brake and the rigid supply line.
- 2.4.2 For dual brake installations, it is important to "tee" the two brake air cylinders, with two equal short lengths of flexible hose, into a single flow control valve and air supply. Utilizing a single flow control valve aids in synchronizing dual brake action during engagement.
- 2.4.3 Refer to 1.3 for operating air pressure requirements

## 3.0 MAINTENANCE



**Warning:**  
Before performing any work, read this manual and study the brake drawings, Figure 1 through Figure 3. Know what needs to be done. Do not risk injury. Follow the instructions!

### 3.1 Inspection:

Periodically or whenever the machinery is shut down for maintenance, inspect the CTE brake, brake drum, supports and air connections for wear, minor damage or conditions that will affect brake performance. This section contains items to check and action to take during an inspection.



**Warning:**  
Set and block the machine in a safe position and disconnect all electrical power to the machine to prevent machine operation during brake inspection.

### 3.1.1 Brake Drum Friction Surface:

- 3.1.1.1 If the drum friction surface is badly grooved or worn, the surface may be re-machined, but **not less** than the minimum allowable drum diameter given in Table 4.



**Warning:**  
Do not machine the drum diameter below the minimum drum diameter allowed. To do so can cause brake torque to rapidly diminish to zero torque even though the friction linings (18) are only partially worn. This could result in personal injury or damage to the machine.

- 3.1.1.2 Check the drum surface for grease or oil contamination. The surface may be cleaned with a cloth dampened with a solvent.



**Warning:**  
Most solvents are flammable and should be used with the proper safety precautions.

Oil or grease on the drum friction surface or the linings (refer to 3.1.2.3) will significantly reduce the torque capability of the brake and result in poor stopping action.

### 3.1.2 Friction Linings (18):

- 3.1.2.1 Friction linings that have been worn to the minimum allowable thickness, as given in Table 5, must be replaced. (Refer to 3.3)



**Caution:**  
The friction linings do not normally wear evenly, and must be replaced when the minimum thickness is attained at any point of the working friction material surface. Usually the greatest wear occurs at a point 90 degrees from the reaction pin to the brake shoe (17). If the lining thickness is below the minimum, the fastener head will score the drum and the friction lining may come loose

**TABLE 4 - Original and Minimum Drum Diameters**

Brake Size	Original Drum Diameter	Minimum Drum Diameter
12CTE237	12.000" (304.8mm)	11.938" (303.2mm)
18CTE300	18.000" (457.2mm)	17.969" (456.4mm)
24CTE500	24.000" (609.6mm)	23.875" (606.4mm)

TABLE 5 - Original and Minimum Lining Thickness		
Brake Size	Original Lining Thickness	Minimum Allowable Friction Lining Thickness
12CTE237	0.312" (7.9mm)	0.156" (4.0mm)
18CTE300	0.375" (9.5mm)	0.188" (4.8mm)
24CTE500	0.500" (12.7mm)	0.250" (6.4mm)

3.1.2.2 If the friction linings are glazed, they may be lightly sanded to remove the glazing **PROVIDED THEY DO NOT CONTAIN ASBESTOS.**



**Warning:**

Older linings (woven type) used on the brake assemblies may have contained asbestos. Current linings are a molded material (non-woven) with a steel metal backings. If the lining is found to not have the steel metal backing it may contain asbestos. Using appropriate precautions for working with asbestos, remove the linings and dispose of properly. **DO NOT ATTEMPT TO SAND FRICTION MATERIAL CONTAINING ASBESTOS.**



**Warning:**

When working with any friction material, regardless of whether or not it contains asbestos, always wear approved safety equipment.

3.1.2.3 If the friction linings have been contaminated by oil or grease, the linings **must** be replaced. Refer to 3.3.



**Warning:**

Oil or grease on the linings or drum surface will significantly reduce the torque capacity of the brake and result in poor stopping action.

**3.1.3 Springs (32, 44)**

3.1.3.1 Check for the correct settings by following the instructions in 3.2.

3.1.3.2 If the settings per 3.2. are correct but the brake does not develop proper torque, the springs may have taken a set. Check of the spring free height will determine if the spring has taken a set. Table 6 gives the minimum allowable spring free height. To check the spring free height, the stop nuts (29, 50) must be loosened so that the spring is not compressed. If there is sufficient space, this can be done on the machine, otherwise, the brake must be removed from the machine in the reverse sequence from that in which it was installed. Refer to 2.2.

If the measured spring free height of any spring is less than the minimum, replace all of the springs as a set. For proper brake operation, use only Airflex supplied springs. If spring not supplied by Airflex are used, proper brake torque may not be developed. After this check, the brake must be adjusted. Refer to 3.2.

TABLE 6 - Original and Minimum Spring Free Heights				
Brake Size	Original Spring Free Height		Minimum Spring Height	
	Spring (32)	Spring (44)	Spring (32)	Spring (44)
12CTE237	5.00" (127mm)	-	4.89" (124mm)	-
18CTE300	4.00" (102mm)	6.00" (152mm)	3.90" (99mm)	5.88" (149mm)
24CTE500	5.00" (127mm)	7.00" (178mm)	4.89" (124mm)	6.87" (174mm)



## Caution:

**If the brake spring free height is less than the minimum allowable, proper brake torque will not be developed.**

### 3.1.4 Reaction Mounting Pin and Pin (16):

- 3.1.4.1 Check the brake movement on the reaction pin and at pin (16). Both pins should allow the brake to pivot freely for full brake wrap up and shoe contact when the brake is engaged.
- 3.1.4.2 If the 12CTE237 brake does not pivot freely at both pins, the brake should be removed from the machine, and the brake pins and mating bores cleaned and coated with an NLGI No. 2 molybdenum disulfide grease before reassembly. The brake should then be adjusted as described under 2.3 and 3.2
- 3.1.4.3 If the 18CTE300 or the 24CTE500 brakes do not pivot freely at the reaction pin, apply an NLGI No.2 molybdenum disulfide grease at the grease fitting at the end of the pin. If the brake still does not pivot freely, remove the brake from the machine, clean the pin, fitting and mating bore and coat with the above grease before reassembly. If these brakes do not pivot freely at the pin (16), the brake must be removed, cleaned and greased as with the reaction pin above before re-assembly.

### 3.1.5 Air System

Check for leaks and repair.

### 3.1.6 Sluggish Disengagement:

- 3.1.6.1 Poor alignment or a loose mounting bracket may cause sluggish disengagement. Check brake alignment.
- 3.1.6.2 If spring gap settings are correct but disengagement is sluggish, the power cylinder (4) should be checked. (Refer to 3.4). If the piston (5) is distorted or rod (9) is bent, they should be replaced. If the piston (5) has become sluggish due to contaminated air, the piston should be removed from the cylinder and both piston and cylinder cleaned and lubricated with Dow Corning 55M grease or equivalent. Refer to 3.4.
- 3.1.6.3 If the piston leaks air or the air cylinder is scored follow instructions per 3.4.

- 3.1.6.4 Low air pressure will cause sluggish brake release. A minimum air pressure as given in 1.3 is required for proper operation. If the low air pressure is due to a high cyclic rate, install a surge tank.
- 3.1.6.5 For the 12CTE237 and the 24CTE500 brakes, if the movement of the spring rod (24) through the ball bushings (22) is restricted, the brake operation will be sluggish. The spring rod and the ball bushings should be inspected. Any burrs on the spring rod or metal chips or abrasive particles should be removed. Check the spring rod for wear in the area where it slides in the ball bushings. If the rod is worn 0.020" (0.50mm) on diameter, replace the trunnion subassembly (23).
- 3.1.6.6 Check the ball bushing for free movement and wear. To inspect these parts, the brake must be disassembled. Refer to 2.2.4. To replace the ball bushings, they must be pressed out from their seat. The spherical races of the new ball bushings are to be lubricated with an NLGI No.2 molybdenum disulfide grease prior to pressing into the brake shoes. When installing, apply a light coating of Loctite #601 (green), or equivalent to the O.D. of the bearing and press into the seat. Be careful to avoid getting Loctite into the inside of the bearing.
- 3.1.6.7 If the flow valve (38) does not allow proper air flow, the brake response will be improper. To check the valve, remove the valve and inspect the spring and air orifices. Replace the valve if the spring is broken. Clean the orifices.
- 3.1.6.8 For the 12CTE237 brake, check the rubber rod covers (36) for cracks. If the cover is cracked, it may allow particles to enter and inhibit the free movement of the spring rod (24) in the ball bushings. To replace the covers, the brake must be disassembled. Refer to 2.2.4.
- 3.1.7 If no further work is required on the brake reconnect the air supply and electrical power and set the brake. Remove the machine blocks.

## 3.2 Brake Adjustments



## Warning:

**Do not attempt to increase brake torque with stronger springs or by any other means. Brake failure could result with hazardous consequences. Proper brake adjustment and good friction surface conditions will provide optimum torque conditions.**



### **Warning:**

**Set and block the machine in a safe position to prevent hazards when the brake is released. Disconnect all electrical power before making brake adjustments.**

#### **3.2.1 Brake Size 12CTE237 Adjustment:**

- 3.2.1.1 Refer to Figure 1. If it is necessary to obtain more access to the stop nuts (29), with the air pressure released from the cylinder (4), remove the cap screws (10), washers (11) and spring shields (27).
- 3.2.1.2 With no applied air pressure, and with the brake in place on the drum and reaction pin, adjust the stop nuts (29) on the lower rod (24) until the "X" dimensions are equal while maintaining the "Z" dimension at 0.12" (3mm).
- 3.2.1.3 Apply air pressure (refer to 1.3) to release the brake from the drum and then adjust the stop nuts (29) on the upper rod (28) until the "Y" gaps are approximately 0.03" (0.8mm).
- 3.2.1.4 Apply and release the air pressure several times to ensure that the above adjustments are maintained. Readjust, if required. Tighten all lock nuts (29).



### **Warning:**

**Failure to tighten the locknuts will result in loss of brake adjustment and loss of braking torque. Hazardous conditions or personal injury may result.**

- 3.2.1.5 If faster brake response is desired, the clearance between the friction linings (18) and the brake drum can be reduced by complying with 3.2 through 3.2.1.4 and decreasing the "Z" dimensions from that given in 3.2.1.2: however, the clearance selected must be such that no contact occurs between the rotating drum and the released friction linings. Note that decreasing the "Z" dimensions increases brake spring compression (32), and proportionately increases both developed brake torque and required brake operating air pressure.

- 3.2.1.6 If lower brake operating air pressure is desired, the "Y" gap dimensions may be increased; however, developed brake torque will be proportionately decreased.



### **Warning:**

**Developed brake torque may be less than rated brake torque if the "increase in "Y" gap" procedure is followed.**

- 3.2.1.7 After all adjustments are made, install the spring shields (27) if removed in 3.2.1.1. Set the brake and remove all safety blocks and reconnect electrical power.



### **Warning:**

**Spring shields (27) must be reinstalled before operating the brake. If the spring shields are not replaced, the spring or spring rod may fail which could result in personal injury.**

#### **3.2.2 Brake Sizes 18CTE300 and 24CTE500**

- 3.2.2.1 Refer to Figure 2 or 3 depending on brake size. If it is necessary to obtain more access to stop nuts (29, 50), with the air pressure released from the cylinder (4), remove the cap screws (10), washers (11) and spring shield (27).
- 3.2.2.2 With no applied air pressure, and with the brake in place on the drum and reaction pin, adjust the stop nuts (29) on the upper rod (24) until the "X" dimensions are equal, the "B" gap is zero and the "C" gap is 0.375" (9.5mm) for the 18CTE300 and the "C" gap is 0.500" (12.7mm) for the 24CTE500.
- 3.2.2.3 Apply air pressure (refer to 1.3) to release the brake from the drum. While maintaining air pressure, adjust the stop nuts (50) on the lower rod (28) so that the "Y" gaps are approximately 0.06" (1.5mm) each.
- 3.2.2.4 Apply and release the air pressure several times to ensure that the above adjustments are maintained. Readjust, if necessary. Tighten all locknuts.



### **Warning:**

**Failure to tighten the locknuts will result in loss of brake adjustment and braking torque. Hazardous conditions or personal injury may result.**

- 3.2.2.5 If faster brake response is desired, the clearance between the friction lining (18) and the brake drum can be reduced by complying with 3.2.3.2.2.1 through 3.2.2.4 and decreasing the “C” gap from that given in 3.2.2.2; however, the clearance selected must be such that no contact occurs between the rotating drum and the released friction linings. Note that decreasing the “C” gap increases brake spring compression (32), and proportionately increases both developed brake torque and required brake operating air pressure.
- 3.2.6 If lower brake operating air pressure is desired the “Y” gap dimensions may be increased; however developed brake torque will be proportionately decreased.



### **Warning:**

**Developed brake torque may be less than rated brake torque if the increase in “Y gap” procedure is followed.**

- 3.2.2.7 After all adjustments are made, reinstall the spring shield (27) if removed in 3.2.2.1. Set the brake and remove all safety blocks and reconnect electrical power.



### **Warning:**

**Spring shields (27) must be reinstalled before operating the brake. If the spring shields are not replaced, failure of the spring or spring rod may fail which could result in personal injury.**

- 3.2.3 If an off-balance mounting (refer to 2.2.5) as shown in Figure 5 is used, after these adjustments the top shoe (14) may ride on the drum when the brake is released. To prevent the shoe from dragging, the brake support must be adjusted,

## 3.3 Friction Lining Replacement:



### **Warning:**

**Older linings (woven- type) used on the brake assemblies may have contained asbestos. Current linings are a molded material (non-woven) with a steel metal backing. If the lining is found to not have the steel backing it may contain asbestos. Using appropriate precautions for working with asbestos, remove the linings and dispose of properly. DO NOT ATTEMPT TO SAND FRICTION MATERIAL CONTAINING ASBESTOS.**



### **Warning:**

**When working with any friction material, regardless of whether or not it contains asbestos, always wear approved safety equipment.**



### **Caution:**

**Friction linings that are worn below the minimum allowable thickness given in Table 5 or that have been contaminated with oil or grease, MUST be replaced, otherwise, the brake torque capability will be reduced and a hazardous condition may result.**

- 3.3.1 The CTE brake linings may be replaced in the field. To obtain rated torque, use only Airflex supplied friction linings. Friction linings **not** supplied by Airflex may **not** produce adequate torque or wear life.



### **Warning:**

**Set and block the machine in a safe position to prevent hazards when the brake is released. Disconnect all electrical power before releasing the brake.**

- 3.3.2 To replace the linings, the brake must be removed from the machine. This is done by following a reverse sequence of the installation instructions given in 2.2.

### **3.3.3 Lining Replacement**

The linings on the 12CTE237 are fastened to the brake shoes with flush head type rivets (19). Drill out the old rivets and remove the linings. When

fastening the new linings, start at the center of the lining and work towards the ends.

The linings on the 18CTE300 and the 24CTE500 are fastened to the brake shoes with Phillips recessed flat head machine screws (45) and lock nuts (46). Remove the old linings and replace with the new by fastening at the center of the lining and work towards the ends. Use new screws (45) and locknuts (46).

**3.3.4** Reinstall the brake on the machine per the instructions given in 2.2.

**3.3.5** Reconnect electrical power and air supply and then engage brake. Remove machine blocks.

### **3.4 Cylinder and/or Piston Replacement:**



#### **Warning:**

**Set and block the machine in a safe position to prevent hazards when the brake is released. Disconnect all electrical power before releasing the brake.**

**3.4.1** Part replacement is easier if the brake is removed from the machine by following a reverse sequence of the installation instructions given in 2.2.

**3.4.2** Partially disassemble the brake by following the instruction given in 2.2.4.1 through 2.2.4.6.

**3.4.3** Remove snap ring (7) and end cap (6).

**3.4.4** Remove the piston rod assembly consisting of parts (2), (3), (5), (9) and (12). Parts (3) and (12) are not used on the 24CTE500 brake.

**3.4.5** Inspect the rubber piston (5). If the seal lip on the pressurized side is worn or damaged, it is possible to turn the piston around on the piston rod (9) to utilize the other side.

**3.4.6** Remove the hex head screw (2), lockwasher (12) and spacer (3) from the piston rod from the 12CTE237 and 18CTE300 brakes. On the 24CTE500, remove the stop nut (2) from the piston rod (9).

**3.4.7** Remove the piston. Check the rod (9) for wear if the rod is worn more than 0.020" (0.50mm) on diameter, it must be replaced. Check the flange

bearing (8) for wear. If wear is more than 0.020" (0.50mm) on diameter, it must be replaced by pressing it out of the end cap (6). When installing the new flange bearing, apply a light coating of Loctite #601 (green) to its mating bore, and press into seat.

**3.4.8** If the old piston is to be used (refer to 3.4.5), turn it around and reinstall it on the piston rod or install a new piston on the piston rod. Reinstall the hardware removed in 3.4.6. On the 12CTE237 and 18CTE300, apply Loctite 242 (blue), or equivalent to the threads of the hex head screw (2), install and tighten to 70 ft-lbs. On the 24CTE500, tighten the stop nut (2) to 30 ft-lbs. Use a soft faced vice to hold the piston rod to prevent damage to the rod.



#### **Caution:**

**The piston rod must be free of burrs and nicks to avoid premature wear of the flange bearing and eventual failure.**

**3.4.9** Thoroughly clean the bore of the cylinder (4). If the inside surface is scored, the cylinder must be replaced. The cylinder must be pressed out of the brake shoe. When ready to install the new cylinder, apply a light coating of Loctite #601 (green) around the mating hole, for the cylinder, in the brake shoe (17) and press in the cylinder.

**3.4.10** Coat the bore of the cylinder (4) with Dow Corning 55M grease, or equivalent.

**3.4.11** Slide the piston rod (9) of the piston rod assembly into the end cap (6) and insert the assembly into the cylinder. Lock the end cap in place with the snap ring (7).

**3.4.12** Reassemble the brake by following Steps 2.2.4.7 through 2.2.4.11.



#### **Warning:**

**Spring shield (17) must be reinstalled before operating the brake. If the spring shields are not replaced, the spring or spring rod may fail which could result in personal injury.**



## **4.0 ORDERING INFORMATION/ TECHNICAL ASSISTANCE**

### **4.1 Equipment Reference**

- 4.1.1 In any correspondence regarding Airflex Equipment, refer to the information on the product nameplate and call or write:

Eaton Corporation  
Airflex Division  
9919 Clinton Road  
Cleveland, Ohio 44144

Tel: (216) 281-2211  
Toll Free (800) AIRFLEX or (800) 824-1586  
Fax: (216) 281-3890

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## 5.0 PARTS LIST

Item	Description	Qty.	Component Part Numbers		
			12CTE237	18CTE300	24CTE500
-	Complete Assembly	-	142611RG	142614GA	142740BS
2	Hex Head Screw	Note 1	000197 X 0408	00197 X 0408	000110 X 0012
3	Spacer	1	203569	203569	-
4	Cylinder	1	412807	412807	413544
5	Piston	1	405835-03	405835-03	405835-05
6	End Cap	1	412813	412813	413365
7	Snap Ring	1	000140 X 0006	000140 X 0006	000140 X 0007
8	Flange Bearing	1	000153 X 0715	000153 X 0715	000153 X 0765
9	Piston Rod	1	306241	306241-	306899-
10	Hex Head Screw	4	000197 X 0204	000197 X 0204	000197 X 0206
11	Lockwasher	4	000068 X 0007	000068 X 0007	000068 X 0007
12	Lockwasher	1	000111 X 0004	000111 X 0004	-
13	Hose Assembly	1	000318 X 0003x2	000318 X 0002	000318 X 0002
14	Brake Shoe	1	509947	513595	513589
15	Snap Ring	2	000139 x 0014	000139 X 0014	000139 X 0010
16	Pin	1	200856	307932	203906
17	Brake Shoe	1	509948	513594	513588-
18	Friction Block	Note 2	Note 4	(4) 415186-	(2) 415893
19	Rivet	20	000130 x 0075	-	-
22	Bail Bushing	2	000153 x 0284	-	000153 X 0320
23	Trunnion Sub-Assembly	1	412810	507210	408055
24	Rod	Note 3	302860	302832	303975
25	Trunnion Block	Note 3	412809	305725-	303974
26	Dowe	Note 3	000194 x 0017	000194 X 0016	000194 X 0016
27	Spring Shield	2	413434	413280	413363
28	Rod	1	302860	302834	303348
29	Stop Nut	Note 4	(8) 000110 X 0039	(3) 000110 X 0042	(4) 000110 X 0035
30	Washer	Note 4	(2) 203568	(1) 000067 X 0014	(1) 000067 X 0015
31	Spring Tube	2	307835	306723-01-	306723-02-
32	Spring	Note 4	(4) 000071 X 0084	(1) 203797	(1) 203796
35	Washer	2	202084-	000067 X 0032	000067 X 0032
36	Rod Cover	2	203585	-	-
37	Pipe Nipple	1	000070 X 0166	000070 X 0166	-
38	Flow Valve Assembly	1	145980	145980	303823-03
44	Spring	2	-	000071 X 0072	000071 X 0006
45	Button Head Screw	24	-	000361 X 0030	000361 X 0108
46	Stop Nut	24	-	000110 X 0055	000110 X 0022
47	Washer	1	-	000153 X 0149	-
48	Spring Sleeve	1	-	302837	303973
50	Stop Nut	4	-	000110 X 0034	000110 X 0034
52	Sleeve	1	-	302836	202778
53	Special Hex Nut	1	-	302835	-
55	Washer	1	-	-	000153 X 0669
56	Decal (Drum Rotation)	1	-	202184	202184
57	Decal (Drum Rotation)	1	-	202191	202191
58	Friction Block Assy. (Short)	2	415162-01	-	-
59	Friction Block Assy. (Long)	2	415162-02	-	-

Note:

Note 1: On the 24CTE500 Brake this part is an ESNA Stop Nut.

Note 2: To obtain rated torque, use only Airflex supplied Friction Block.

Note 3: These parts form Part 23. Do not order separately.

Note 4: Quantities for each brake size are shown in brackets ( ).



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Subject to the conditions stated herein, Eaton Corporation warrants to the Purchaser that each new Airflex Product manufactured by Eaton will be free from failures caused by defects in material and workmanship, and will deliver its rated capacity, for a period of twelve (12) months from the date of shipment to Purchaser, provided such Product is properly installed, properly maintained, operated under normal conditions and with competent supervision. Warranty claims shall be made in writing and the part or parts shall, if requested by Airflex Division, be returned prepaid to the Airflex Division for inspection. Upon a determination that a defect exists, Eaton shall thereupon correct any defect, at its option either by repairing any defective part or parts or by making available at Eaton's plant a repaired or replacement part. This warranty does not extend to normal wear parts or components of the Product, such as friction material and friction surfaces.

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