WSB 11205

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.

Installation, Operation and Maintenance of Airflex® Model WCSBEP* Tensioner / Brake
(for size 36EP)

***For prior model 36WCSB**
See manual WSB 11200

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:**(800) 233-5926**
Outside the U.S.A. & Canada: **(216) 281-2211**
Internet: **www.eaton.com/airflex**

April, 2010

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Powering Business Worldwide

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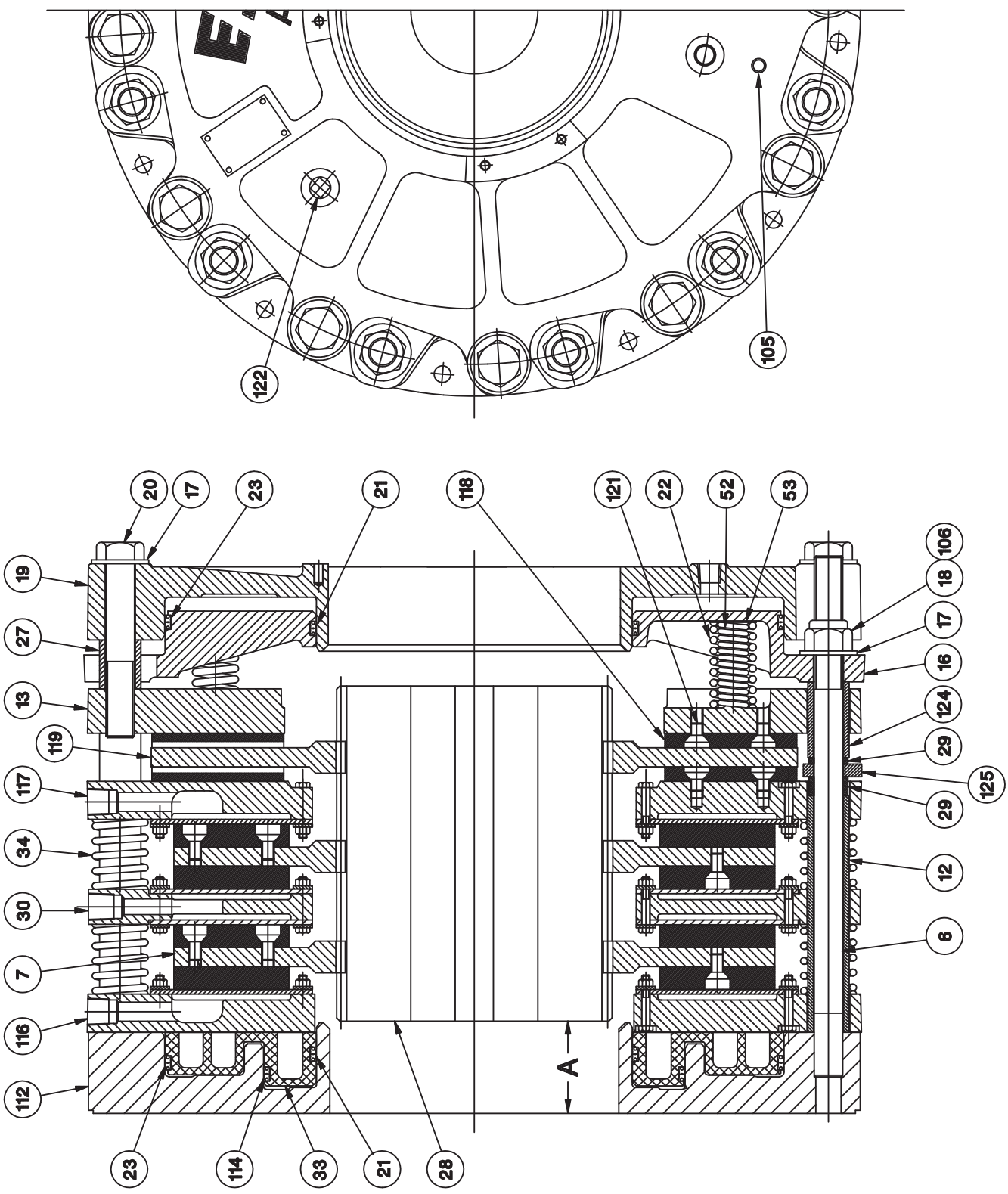

Figure 1 : WCSBEP Cross Section and Item Numbers

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TABLE 1					
36WCSBEP Item Description (Ref. Figure 1)					
Item	**Description**	**Item**	**Description**	**Item**	**Description**
6	Stud	23	Seal	112	Mounting Flange/ Cylinder
7*	Friction Disc Assembly	27	Spacer Tube	117	Seal
12	Clamp Tube	28	Gear	116*	Pressure Plate Sub-Assembly
13	Pressure Plate Sub-Assembly	29	Wear Spacer	117*	End Plate Sub-Assembly
16	Spring Housing	30*	Reaction Plate Sub-Assembly	118	Friction Disc
17	Flat Washer	33	Dual Piston	119	Disc
18	Self Locking Nut	34	Reaction Spring	121	Flat Head Screw
19	Cylinder	52	Inner Spring	122	Pipe Plug
20	Hex Head Screw	53	Spring Retainer	124	Clamp Tube
21	Seal	105	Pipe Plug	125	Stop Plate
22	Outer Spring	106	Sleeve Nut		
* See Section 6.2 for sub-assembly illustrated parts lists and component descriptions.					

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 equipment. Three signal words "**DANGER**", "**WARNING**" and "**CAUTION**" are used to indicate the severity of a hazard, and are preceded by the safety alert symbol ⚠

⚠ Danger

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

⚠ Warning

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

⚠ Caution

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

It is the responsibility and 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

⚠ Caution

procedures by which hazards can be avoided.

1.1 Description

1.1.1 The Airflex WCSBEP water-cooled tensioner is designed for constant tension applications. It is exceptionally well suited for high inertia stopping and rapid heat dissipation. The WCSBEP incorporates both an air applied water-cooled tensioner and an air-cooled spring set brake into one relatively compact unit. The water-cooled section is used for high energy, constant slip tensioning, while the spring set brake serves as an emergency stopping or parking brake. The design of the WCSBEP tensioner permits mid-shaft or end-shaft mounting. The rugged construction ensures long, trouble free service.

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1.1.2 WCSBEP tensioners are available in various quantities of friction discs. The model number identifies the number of discs and the nominal disc diameter. For example, 336WCSBEP indicates three 36" diameter discs. Note that the air-cooled disc is typically larger in diameter by 2" when compared to the water-cooled disc; therefore, the model number will refer to the diameter of the water-cooled discs only. Additional notations are made in describing the model number to indicate the number of water-cooled (WC) disc assemblies and number of air cooled (AC) discs. For example, a 436WCSBEP (3WC/1AC) would indicate three water-cooled discs and one air-cooled disc, whereas a 436WCSBEP (2WC/2AC) would indicate two water-cooled and two air-cooled discs.

1.1.3 When size, such as 36WCSBEP, is referred to in this manual, it means that the information given applies to all models using the 36" diameter water-cooled disc assembly; i.e., 236WCSBEP, 336WCSBEP, etc.

1.1.4 The air applied pistons in the tensioner are available in either single or dual piston designs. The dual piston feature allows for more finite torque modulation of the tensioner when used with suitable valves and control systems.

1.1.5 Tensioners can be used with either closed loop or open loop water systems.

1.1.6 This manual includes metric equivalents usually shown in ( ) following the U.S. measurement system value. Be sure to use the correct value.

1.2 How It Works

1.2.1 Referring to **Figure 1**, the gear (28) is mounted on the shaft which is to be stopped and the tensioner assembly is attached to the machine frame or a reaction bracket.

Air pressure is first applied through the ports in the mounting flange/cylinder (112) causing the piston (33) to apply force to the pressure plate assembly (116). As air pressure is applied through the ports in the cylinder (19) on the spring set section of the unit, the cylinder and pressure plate (13), which are attached to each other with screws (20), flat washers (17) and spacer tubes (27), move away from the mounting flange (112), which is connected to the machine frame or reaction bracket. The pressure plate compresses the springs (22) and (53) against the stationary spring housing (16). As the pressure plate moves, the end plate subassembly (117) also moves away from the mounting flange/cylinder until it rests against the stop plates (125) which are axially fixed. The pressure plate (13) then continues to move away from the end plate subassembly and the clamp force is removed from the disc (119) that rides on the gear.

As the end plate subassembly (117) moves towards the stop plates, the piston (33) and friction disc subassemblies (7) also move by means of the air pressure initially applied. Relieving the air pressure within the mounting flange/cylinder reduces the clamp force applied to the friction discs, allowing the shaft to be free to rotate. Modulation of the air pressure then controls applied torque of tensioner.

As air pressure is exhausted from both the mounting flange/cylinder (112) and the cylinder (19), the springs force the pressure plate (13) toward the mounting flange, clamping the disc (119) between the pressure plate and the end plate subassembly (117). As the piston (33) retracts, the endplate subassembly continues to move towards the mounting flange/cylinder, pressing against the friction disc assemblies (7), reaction plate (30) and pressure plate subassembly (116). As the pressure plate (116) comes to rest against the mounting flange, the spring force clamps all discs between adjacent surfaces, applying stopping torque to the shaft.

High heat dissipation within the tensioner section in the WCSBEP is accomplished by passing water through a special cavity behind copper alloy wear plates (3).

2.0 INSTALLATION

⚠ Warning

Only qualified maintenance personnel should install, adjust or repair these units. Faulty workmanship will result in unreasonable exposure to hazardous conditions or personal injury.

⚠ Caution

Read these instructions thoroughly and review until you fully understand the installation sequence before proceeding with the work described in this section. Failure to follow these instructions will result in unreasonable exposure to hazardous conditions or personal injury.

⚠ Caution

Do not paint the clamp tubes (12), (124), wear spacers (29), or the springs (34), as this may hinder the engagement or disengagement of the tensioner.

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2.1 Preparation

2.1.1 Refer to the appropriate catalog information (available upon request) for appropriate envelope dimensions, mounting register diameters, mounting bolt circles and positions, and stud support bracket recommendations for each specific tensioner.

2.1.2 The tensioner reaction member should have a machined register to allow for mounting and alignment control of the tensioner and allow for full support of the face of the mounting flange/cylinder (112).

2.1.3 For proper operation and service life, the tensioner reaction member must be aligned to the shaft within the limits shown in Table 2.

⚠ Caution

Proper alignment is necessary to ensure that the friction discs track properly. Improper alignment will result in excessive wear to the friction material and mating surfaces, plus the gear and splined bore of the friction disc assemblies. See Figure 2.

2.1.4 Refer to the appropriate assembly drawing for the setup dimension between the tensioner mounting surface and the end of the gear (dimension "A" on **Figure 1**). Gears should be positioned to ensure that - when the tensioner is mounted - the disc splines will not overhang the end of the gear when components are in both new and worn conditions. The gear is typically bored and keyed for a resulting Class FN2S interference fit for inch shafting and ISO System S7h6 for metric shafting. Contact Airflex Application Engineering for specific recommendations.

2.2 Mounting

2.2.1 The WCSBEP must be mounted to a clean, rigid surface with hardened flat washers and screws of the grade, quantity, and size as listed in Table 3. Mounting to a properly aligned, rigid surface that fully supports the face of the mounting flange minimizes any deflection during operation and helps to ensure that the friction discs will track properly on the copper wear plates.

TABLE 2
Alignment Requirements

Size	Cocentricity (Parallel, TIR) of Shaft and Tensioner Inches (mm)	Perpendicularity (Angular, TIR) of Mounting Flange to Shaft* Inches (mm)
36WCSBEP	0.010 (0.25)	0.019 (0.48)

* Perpendicularity measured near the outside diameter of the mounting flange

⚠ Danger

Use only the proper number and grade fasteners shown in Table 3. Use of commercial grade (Grade 2) fasteners where Grade 8 fasteners are specified may result in failure of the fasteners and a sudden and drastic reduction in brake torque.

⚠ Caution

Water inlets and outlets must be located as close as possible to the 6 o'clock and 12 o'clock positions, respectively. This will help to prevent air pockets in the water cavities, which would allow the tensioner to overheat.

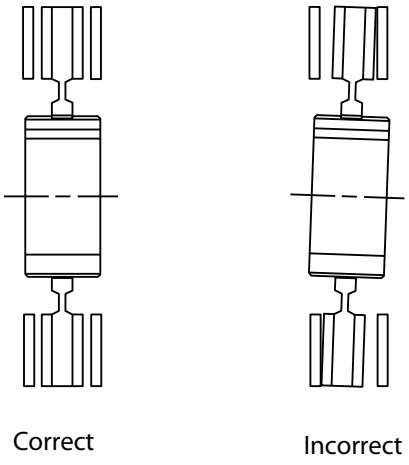

Figure 2 : Proper vs Improper alignment of WCSBEP

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TABLE 3 Fastener Description and Assembly Torque: ft.lb. (Nm)		
Item # Description	**Specification**	**36WCSBEP**
4 / 5 Wear Plate Screws	Size	3/8-16-NC2 Gr. 8
	Torque (Dry)	40 (54)
18 / 106 Locknut	Size	1 1/8-6 NC Gr. 8
	Torque (Lubed)	750 (1016)
20 Hex Head Screw	Size	1 3/8-6 NC Gr. 8
	Torque (Lubed)	750 (1016)
57 WC Friction Disc Screw	Loctite®	#262
	Torque (Lubed)	15 (20)
121 Dry Friction Disc Screw	Loctite®	#262
	Torque (Lubed)	20 (27)
Mounting Screw	Size	1 - 8 NC-2 Gr. 8
	Quanity	14
	Torque (Lubed)	660 (895)

2.2.2 Ensure that the shaft is free of nicks or burrs and the key fits properly in the shaft and gear.

2.2.3 Apply a light coat of anti-seizing compound to the shaft and key. Tap the key into the shaft keyway.

Note : Before installing the gear (28) onto the shaft, slide it into the brake assembly to align the splines in the friction disc assemblies. Air pressure must be applied to the brake cylinder (19) to release the friction disc assemblies for alignment. Once the gear passes through all friction disc assemblies, exhaust the air to clamp them into position and remove the gear.

2.2.4 Heat the gear uniformly to 250°F (121°C) to expand the bore and ease assembly. Press the gear onto the shaft, making sure that the dimension between the gear and the tensioner mounting surface ("A") is maintained. See **Figure 1**. Allow the gear to cool.

2.2.5 Apply a thin coat of MOLUB-ALLOY® OG Heavy - or equivalent - grease to the splines of the gear.

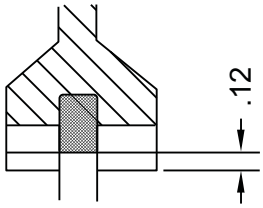
⚠ Caution

Excessive lubricant may contaminate friction material, resulting in erratic response or loss of torque.

⚠ Caution

The use of anti-seize or bearing greases on the gear splines may result in premature gear and disc spline wear.

2.2.6 Pre-fill the grease channel in the friction disc splines (if applicable) with MOLUB-ALLOY® OG Heavy - or equivalent - grease, as shown on **Figure 3**.



FILL GREASE CHANNEL 360°
WITH MOLUB-ALLOY O.G. HEAVY
GREASE TO WITHIN .12 OF I.D.
AS SHOWN.

Figure 3 : Grease Requirement

2.2.7 Rig the WCSBEP into position and slide it over the gear. Avoid placing lifting straps or cables directly on the release springs (34).

2.2.8 While supporting the WCSBEP, connect an air supply to the cylinder (19) and apply adequate pressure to release the brake. Attach the mounting flange (2) to the mounting surface using the appropriate fasteners. Tighten the fasteners to the specified torque value. See Table 3. Exhaust the air from the cylinder after tightening the fasteners.

⚠ Caution

Maximum allowable air pressure in the cylinder (19) is 150 psi (10.2 bar).

2.2.9 Some brakes (typically 3 and 4 disc assemblies) require an additional support bracket to minimize torsional deflection during operation. Refer to the appropriate assembly drawing for bracket recommendations. The bracket, when required, will fit over the sleeve nuts (106) located on the studs (6) closest to the 6 o'clock position. Secure the bracket onto the sleeve nuts with flat washers (17) and locknuts (18). Tighten the locknuts to the value listed in Table 3. Shim the base of the support bracket as required. Install and tighten fasteners as required to secure the bracket into position.

⚠ Warning

Ensure that the support bracket does not interfere with or bind on the cylinder (19). Interferences could prevent the brake from properly engaging or releasing.

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2.2.10 WCSBEP tensioners should be covered to protect the unit from dirt, rain, overspray, and other sources of external contamination. In extreme environments the use of a sealed enclosure with internal strip heater is recommended to prevent moisture from collecting on the unit.

2.3 Air System

⚠ Warning

Operation of the WCSBEP at pressures exceeding those specified in Section 3.2 may result in damage to components.

⚠ Caution

Minimum releasing pressure for the spring set brake should be observed. Operation at pressures below minimum will result in brake drag, excessive heat and wear, and damage to brake components.

⚠ Caution

When applying operating pressure to only one of two ports on units with dual pressure pistons (33), the second piston pressure port must be open and vented to atmosphere. Porting should be filtered to avoid contamination of the piston/cylinder during single piston actuation.

2.3.1 Maximum allowable pressure is 150 psi (10.2 bar) in the spring set brake cylinder (19), and 150 psi (10.2 bar) in the air applied mounting flange/cylinder (112). See Section 3.2 for other limitations.

2.3.2 Use only clean, filtered air (a 40 micron filter or better is recommended) which is free of excess moisture. Exhaust porting in dual pressure piston/cylinders should also be filtered to avoid contamination when open to atmosphere during single port actuation.

2.3.3 Air inlet sizes are shown in Table 4. Air inlets for the spring set brake are on the face of the cylinder (19). Air inlets for the air applied tensioner (radially located in the mounting flange) should be located at or near the 6 o'clock position to facilitate purging of moisture that may accumulate in the air system.

2.3.4 All pipes should be free of metal chips, cutting compound and any other foreign matter. Pipe ends should be reamed after cutting to eliminate possible restrictions. For optimum air system response, a minimum number of bends and elbows should be used.

TABLE 4
Actuation Port Sizes

Model	Cylinder (3 ports)	Mounting Flange (Small Piston)	Mounting Flange (Large Piston)
36WCSBEP	3/4"-14 NPT	3/8"-18 NPT	3/4"-14 NPT

2.3.5 The final connection to the brake inlet ports on the cylinder (19) must be made with flexible hose. If using only one inlet, connect the hose to the lowest position.

2.3.6 The WCSBEP tensioner does not require lubricated air; however associated control valves may. Consult the valve manufacturer for appropriate recommendations.

2.4 Coolant System

⚠ Caution

Make sure that the water inlets and outlets are positioned as close as possible to the 6 o'clock and 12 o'clock positions, respectively. This will help to minimize the formation of air pockets in the water cavity during operation, which could contribute to overheating of the tensioner.

2.4.1 Maximum allowable coolant pressure is 60 psig (4.1 bar) for size 36WCSBEP units. The use of an accumulator or pressure relief valve may be desirable to reduce the effect of pressure spikes in the coolant system during operation.

⚠ Warning

Maximum allowable water pressure is dependent upon tensioner size. Applied pressure or surges exceeding maximum allowable may result in damage to the tensioner.

2.4.2 The coolant supply and discharge hose, pipe and fitting sizes, along with minimum flow rates for the tensioner rated horsepower, are listed in Table 5.

2.4.3 Coolant supply connections to the tensioner should provide a parallel flow through each section of the tensioner. Series flow is not recommended, as it can lead to overheating of the tensioner.

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2.4.4 Inlet and outlet coolant manifolds must be provided. Manifolds should be constructed to allow for even flow through all ports.

Note : Reaction plates (30) typically have two inlet and two outlet ports to provide for balanced flow to each cooling chamber. In the event that an older style reaction plate with only one inlet and one outlet port is used, water flow should be restricted at the inlets to the pressure plate (116) and end plate (117) to allow for equally proportional heat dissipation at each cooling cavity. Contact the factory for information on water flow balancing when using single ported reaction plates.

2.4.5 Use flexible connecting hose to each tensioner coolant section to allow axial travel of the pressure plate, reaction plate, and end plate during tensioner operation. Hose lengths running between the manifold and the inlet or outlet ports should be equal in length, if possible. Reductions in the recommended line diameter should be avoided to prevent excessive line pressures.

2.4.6 Avoid the use of sharp bends and elbows that will restrict water flow. Loops and bends in the lines may create air pockets, which substantially reduce the flow of coolant and can contribute to overheating.

2.4.7 Coolant and coolant supply lines should be free of foreign material (a 500 micron water filter is recommended). In the event that contaminated water is used as a coolant (not generally recommended), use of a multi-stage filter/strainer may be desirable to avoid the need for frequent cleaning of fine mesh filters.

2.4.8 **Figure 4** illustrates a typical closed loop liquid to liquid coolant system. The heat exchanger and temperature control would be replaced with a radiator, fan and motor in a liquid to air system.

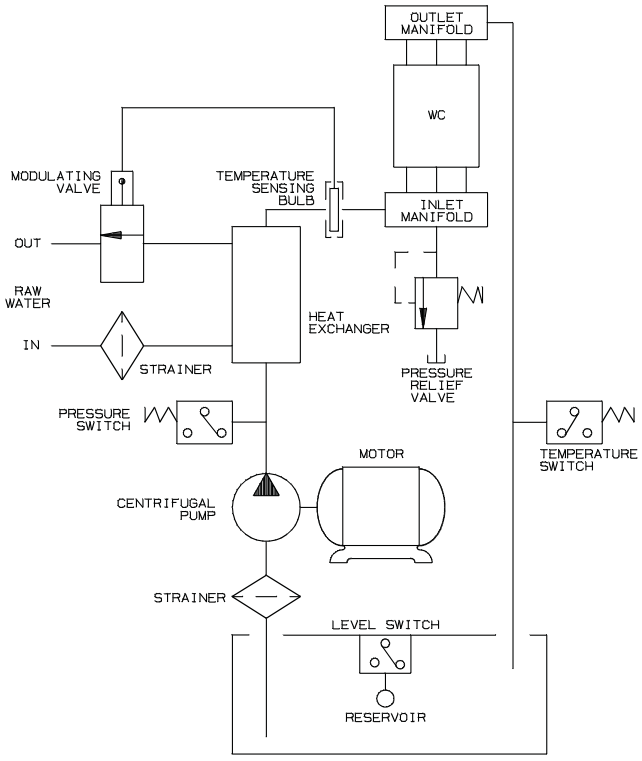

Figure 4 : Typical Closed Loop Liquid to Liquid Coolant System

TABLE 5
WCSBEP Coolant Supply Data

No. of Discs	Disc Size	Thermal Rating[1] HP (kW)	Water Inlet and Outlet Pipe Size (Minimum piping I.D.)	Min. Flow Rate[2] GPM (dm^3/min) 100% Water	Min. Flow Rate[2] GPM (dm^3/min) 70% Water, 30% Ethylene Glycol by Vol.	Min. Flow Rate[2] GPM (dm^3/min) 60% Water, 40% Ethylene Glycol by Vol.	Min. Flow Rate[2] GPM (dm^3/min) 50% Water, 50% Ethylene Glycol by Vol.
1	36”	780 (581)	1- 1/4”-11.5 NPT (1”)	78 (295)	92 (348)	101 (382)	116 (439)
2		1560 (1162)		156 (590)	184 (696)	202 (764)	232 (878)
3		2340 (1743)		234 (885)	276 (1044)	303 (1146)	348 (1317)
4		3120 (2324)		312 (1181)	368 (1393)	404 (1529)	464 (1756)

1 - Thermal rating based on a 70°F (21°C) water inlet temperature and a 50°F (28°C) temperature rise between inlet and outlet

2 - Flow rate is based on requirement of 1 U.S. GPM per 10 HP (1.97 kW per dm^3/min) thermal dissipation.

3 - Maximum pressure at inlet = 60 psig

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2.4.9 The coolant supply temperature at the inlet should be 100°F (38°C) or lower. The coolant outlet temperature should not exceed the values given in Table 6. However, in no event should there be more than a 50°F (28°C) temperature rise between inlet and outlet. See Table 6 for maximum allowable outlet coolant temperature with various water/ethylene glycol mixtures and other cooling media.

TABLE 6
Maximum Mixture Outlet Coolant Temperature

Water/Ethylene Glycol Mixture % by Volume	Maximum Outlet Coolant Temperature °F (°C)
100/0	150 (66)
70/30	165 (74)
60/40	165 (74)
50/50	170 (77)

2.4.10 **Open Loop Systems**

For efficient operation of the WCSBEP, an adequate supply of filtered fresh water is required. (See 2.4.1 - 2.4.2). Excessive water hardness promotes the formation of scale deposits, which, in time, will affect the service life of the WCSBEP unit. Water of high acidity or high in corrosive salts may cause electrolytic corrosion between the dissimilar metals used in the water cavities. Water treatment should be considered if the properties of the water exceed the following:

Equivalent calcium carbonate content hardness: Maximum 100 p.p.m.

pH value: 7.0 to 9.0.

⚠ Caution

Open loop systems should be thoroughly flushed with clean fresh water after operation to reduce the corrosive effects of contaminants on internal components.

2.4.11 Closed Loop Systems

For efficient operation of the WCSBEP in a closed loop system, ethylene glycol coolant conforming to SAE Standard J1034 should be used. For preparation of the proper concentration of a water/ethylene glycol mixture, use make-up water which is low in corrosive ions such as chlorides and sulfates.

Recommended pH value of the water/ethylene glycol mixture: 7.5. to 10.5 .

3.0 OPERATION

3.1 Conditions of Operation

The following Hazard Warnings are to be followed for proper WCSBEP functioning:

⚠ Warning

Friction lining must be worn in to achieve product torque rating. Verify proper operation before putting the product into service. See Section 3.3 for additional burnishing procedures.

⚠ Warning

Protective means must be used to prevent oil, grease, dirt or coolant from coming into contact with the surfaces of the friction discs (8), or the wear plates (3). Oil or grease on these parts will significantly reduce the torque capacity of the unit. Dirt or coolant will produce erratic torque. Do not risk personal injury or damage to the equipment.

⚠ Warning

Maximum free wheeling speed must not exceed the speeds listed in Table 7. Exposure to speeds in excess of these values may cause the friction discs (8) to burst and result in extensive damage to the tensioner and/or cause personal injury.

⚠ Caution

For proper cooling of the WCSBEP tensioner, it is required that the coolant inlet be located as close as possible to the 6 o'clock position and the outlet be located near the 12 o'clock position. This will help to assure that all coolant cavities are water-filled to help avoid overheating.

⚠ Caution

For operation in subfreezing temperatures, ethylene glycol antifreeze must be added to the water. The antifreeze content of the mixture is critical and should not exceed 50% by volume. Excessive amounts of antifreeze will reduce cooling capacity and can cause coolant leakage due to overheating. Refer to Table 6.

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⚠ Caution

Maximum ambient temperature is 110°F (43°C). Minimum ambient temperature for closed loop systems using ethylene glycol antifreeze is 0°F (-18°C). For open loop systems using water as a coolant, the minimum ambient temperature is 45°F (7°C).

3.2 Pressure and Speed Limits

3.2.1 Maximum allowable coolant pressure is 60 psig (4.1 bar) for size 36WCSBEP units. The use of an accumulator or pressure relief valve may be desirable to reduce the effect of pressure spikes in the coolant system during operation.

⚠ Warning

Applied pressure or surges exceeding maximum allowable may result in damage to the tensioner.

3.2.2 Maximum slip speeds and free wheeling disc speeds are shown in Table 7.

⚠ Caution

Excessive slip speeds will result in rapid friction material wear. For good life, the values in Table 7 should not be exceeded.

TABLE 7
Maximum Disc Speeds

Size	Max. Slip Speed RPM	Max. Free Wheeling Speed RPM
36WCSBEP	475	700

3.2.3 Maximum allowable pressure is 150 psig (10.2 bar) in the spring set brake cylinder (19). Refer to the assembly drawing (available on request) for minimum pressure required for full release of the spring set brake. Release pressure is dependent upon the quantity of springs (22) (52) used in the specific brake.

3.2.4 Maximum allowable pressure within the air applied tensioner mounting flange/cylinder (112) is 150 psi (10.2 bar). Maximum operating pressure is specified on the assembly drawing mentioned in 3.2.3.

3.3 Wear-in Procedures

3.3.1 In order to improve initial operation and brake torque, it is suggested that the non-asbestos friction material used in WCSBEP brakes be worn-in prior to normal operation to improve contact of the mating friction surfaces.

⚠ Caution

Machine operation should be monitored closely until the friction couple wears in.

3.3.2 The shaft on which the brake discs are mounted should be free to rotate to allow for run-in. On drawworks applications, disconnect the wire rope from the drawworks drum to allow operation as described in the following paragraphs.

3.3.3 Ensure that the coolant system is operating prior to dynamic operation of the WCSBEP tensioner. Verify that coolant temperature, pressure and flow values are within required settings or limits during operation.

⚠ Caution

Dynamic operation of the WCSBEP - including while in the fully released condition - is not recommended without proper coolant flow in the tensioner. Heat generated during operation could result in damage to brake components.

3.3.4 Release the brake by applying full release pressure through the ports in the cylinder (19) to allow the brake to freely rotate. Apply no pressure to the tensioner pressure ports in the mounting flange/cylinder (112).

3.3.5 Run the motor to achieve a brake disc speed listed in Table 8. Exhaust the air pressure in the brake rapidly to 90 psi (6.1 bar). Slip the brake for the time specified in Table 8, but DO NOT ALLOW THE BRAKE TO SLIP FOR MORE THAN THE TIME SPECIFIED.

⚠ Caution

Slipping the brake at increased time intervals, speeds or pressures other than specified will result in damage to brake components.

TABLE 8
Wear-in Parameters

Size	Operating Speed (RPM)	Slip Time (Seconds)	Wear-in Cycles Required
36WCSBEP	60	20	30

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3.3.6 After the brake has engaged/slipped for up to the maximum slip time specified in Table 8, quickly apply full air pressure to completely release the brake. Smoke rising from the brake should be expected. Freewheel the brake discs at the speed listed in Table 8, allowing the brake disc (119) to cool to a temperature below 120°F (49°C). The use of fans or clean, dry compressed air can be used to accelerate the cooling process.

⚠ Caution

Use proper safety precautions when using forced ventilation.

3.3.7 Monitor the brake disc (119) temperature after slipping and cooling. Do not allow the brake disc temperature to exceed 180°F (82°C).

3.3.8 Repeat steps 3.3.4 thru 3.3.7 for the number of cycles shown in Table 8 to allow for adequate wear-in of the air-cooled brake. Allow the brake disc to completely cool to ambient temperature prior to testing the torque capacity of the brake or returning it to service.

3.4 Operational Sequence

3.4.1 Ensure that the coolant system is operating prior to dynamic operation of the WCSBEP tensioner. Verify that coolant temperature, pressure and flow values are within require settings or limits during operation.

⚠ Caution

Dynamic operation of the WCSBEP - including while in the fully released condition - is not recommended without proper coolant flow in the tensioner. Heat generated during operation could result in damage to brake components.

3.4.2 Air pressure is first applied through the ports in the mounting flange/cylinder (112) to apply force to the piston (33) in the tensioner. Adequate pressure should be applied to support the load the tensioner is controlling. Air pressure is then applied through the ports in the cylinder (19) on the spring set section of the unit, until it is fully released.

⚠ Caution

Observe all pressure and speed limits while operating the WCSBEP tensioner. See Section 3.2.

3.4.3 After release of the spring set brake, slowly relieve the air pressure within the mounting flange/cylinder (112) to reduce the clamp force applied to the friction disc assemblies (7), allowing the shaft to rotate. Modulation of the air pressure will vary the applied torque of the tensioner. Modulation control is dependent upon the specific pneumatic control system used. Refer to the manufacturers' information for operation of control valves or feedback systems.

3.4.4 WCSBEP tensioners with dual pressure pistons (33) provide a more finite range of control. Each chamber within the dual pressure piston can be pressurized independently or simultaneously.

⚠ Caution

When applying or exhausting operating pressure to only one of two ports on units with dual pressure pistons (33), the second piston pressure port must be open/vented to atmosphere. Open ports should be filtered to avoid contamination of the piston and cylinder during piston operation.

3.4.5 Exhausting air pressure from the cylinder (19) of the spring set brake allows it to engage. Air pressure within the mounting flange/cylinder (112) can be exhausted simultaneously with that in the cylinder (19). For more rapid brake response, exhaust the air pressure in the mounting flange/cylinder (112) after engaging the spring set brake.

Note : The spring set brake is intended for parking or emergency braking only.

⚠ Warning

Dynamic braking with the air cooled, spring set brake is not recommended except for emergency stopping situations or during initial wear-in. High heat generated during dynamic braking can result in damage or failure of the brake components.

⚠ Caution

Rapid engagement of a fully released tensioner/brake could result in pressure spikes within the coolant cavities and subsequent leakage.

3.5 Periodic Maintenance

3.5.1 As the friction material wears, adjustment of the brake may be required to keep pistons and cylinders within the proper stroke range. See the MAINTENANCE section for wear adjustment procedures and component wear limits.

3.5.2 Periodically check for external air leakage in the area of the piston seals (21) (23), and internal leakage across the dual pressure piston seals (114). For replacement, refer to procedures in Section 4.0, Maintenance.

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3.5.3 Moisture that may accumulate in the brake cylinder can be purged on size 36WCSBEP units. With air pressure exhausted from the cylinder, remove the pipe plug (105) at the 6 o'clock position on the cylinder, and apply low air pressure to assist in expelling any excess moisture. After draining the cylinder, reinstall the pipe plug, applying a pipe thread sealant on the threads prior to installation.

⚠ Caution

Applied air pressure greater than 10 psi (0.68 bar) should not be used when draining the cylinder. Use adequate shielding to avoid contact with direct spray from moisture being purged from the cylinder.

3.5.4 Periodically observe the rotating discs while the tensioner is fully released. Dragging discs may be caused by wear or contamination of the gear or disc splines, lack of spline lubrication, disc imbalance, warped discs, or misalignment. Correct as required.

3.5.5 Pneumatic and electrical control interlocks should be periodically checked for proper settings and operation.

3.5.6 If leakage or blockage of any water-cooled chamber is suspected, a static or dynamic test may be performed as follows:

3.5.6.1 ***Static Pressure Test:***

a) Release the spring set brake by applying the proper air pressure.

⚠ Warning

Ensure that the machinery will remain in a safe position prior to releasing the brake.

b) Bleed all air from within the coolant cavity. Air bleeding must be accomplished by running coolant through the cavity with the tensioner secured in its proper operating position.

Note : Avoid contaminating the friction material with coolant or water.

⚠ Warning

Contamination of the friction material could result in erratic or loss of torque.

c) After the air has been removed, install a pipe plug(s) in the outlet(s) and apply maximum allowable coolant pressure measured at the inlet to the water cavity. Maximum allowable is 60 psig (4.1 bar) for size 36" units. Maintain this pressure for 30 minutes. Check for leakage at O.D. and I.D. sealing areas.

⚠ Caution

Be sure to apply and retain air pressure to the cylinder (19) of the tensioner to release the spring pressure on the tensioner / brake during static coolant pressure testing. Engagement of the brake during testing could develop surge pressures exceeding the maximum allowable within the coolant cavities resulting in possible damage to the seals.

3.5.6.2 ***Dynamic Flow Test***:

a) Dynamic flow testing of the tensioner should be conducted at the required flow rate for the rated HP dissipation and coolant quality, as given in Table 5. Inlet and outlet pressures for the appropriate tensioner size should not to be exceeded.

b) There should be no restrictions on the outlet side of the brake to cause any back pressure to the unit. Coolant inlet and outlet sizes are listed in Table 5. Full size hoses and piping should be used. Check for low flow and/or leakage at the O.D. and I.D. seal areas.

4.0 MAINTENANCE

⚠ Warning

Before performing any maintenance work on the WCSBEP tensioner, make sure that the machinery will remain in a safe position. Failure to do so could result in serious injury or possibly death.

⚠ Warning

Only qualified maintenance personnel should install, adjust or repair the WCSBEP units. Faulty workmanship will result in unreasonable exposure to hazardous conditions or personal injury.

⚠ Caution

Read these instructions thoroughly and review until you fully understand the parts replacement steps before proceeding with the work described in this section. Failure to follow these instructions can result in unreasonable exposure to hazardous conditions or personal injury.

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4.1 Wear Limits

Warning

Periodically examine the tensioner for wear of friction linings, discs and wear plates. Failure to perform this examination will result in excessive wear, a significant reduction in torque, and may result in personal injury and/or damage to the machinery.

4.1.1 Wear limits for the WCSBEP components are shown in Table 9. If any wear limit has been reached or exceeded, that component must be repaired or replaced.

TABLE 9
Wear Limits for WCSBEP Components (Ref. Fig. 1 and Section 6.2)

Item	Description	Wear Limit	Remarks
#3 Wear Plate	Friction Wear Surface	36WCSBEP - 0.050 inch	Wear will be in form of even wear or circular grooves in the copper surface.
#8 Friction Disc	Friction Material	Fully Worn at bottom of dust groove. Friction material must also be replaced if contaminated with oil or grease.	Brake has adjustment provision. See Section 4.2.
#9, #28, #119 Friction Disc Core, Gear & Disc	Gear Backlash	Maximum total backlash is 0.060 inch (1.5 mm).	If step is worn in gear, gear must be replaced.
#12 Clamp Tube	Reaction Area	Maximum wear is 0.015 inch (0.38 mm).	Wear wil be in the form of notch or step on the side of tube.
#13, #30, #54, #116, #117	Reaction Holes	Maximum wear is 0.031 inch (0.80 mm).	Wear will be in the form of elongation of the holes. Original hole diameters are shown on the table below.
#19 Cylinder	Seal Area	Maximum wear is 0.005 inch (0.13 mm).	Wear wil be in the form of grooves where the seals contact the cylinder wall.
#34, #22, #52 Spring	Spring Free Height	Maximum free height shown on the table below.	Original free height shown on the table below. Springs must be replaced on complete sets.
#119 Disc	Friction Wear Surfaces	Maximum wear is 0.045 inch (1.12 mm) per surface. (0.90 inch (2.24 mm) total).	Original thickness is 1.25 inch (31.7 mm) for size 36.

Item	Description	Tensioner Size
		36WCSBEP
#13, #30, #54, #116, #117	Original Reaction Hole Diameters in the Pressure Plate and Reaction Plate	2.065 (52,45)
#34	Original Free Height	4.00 (101,60)
	Minimum Free Height	3.88 (98,55)
#22	Original Free Height	6.65 (168,91)
	Minimum Free Height	6.37 (161.80)
#52	Original Free Height	6.78 (172,21)
	Minimum Free Height	6.50 (165,10)

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4.2 Wear Adjustment

Wear adjustment is periodically required as the friction material and mating surfaces wear. Wear adjustment reduces the running clearances between these surfaces to help maintain the holding force of the brake (for the spring applied feature), and to maintain the responsiveness of the brake by limiting the travel of components. Mechanical limits within the brake design require that the brake be adjusted when the adjustment points listed in Table 10 have been reached.

⚠ Warning

Failure to perform adjustments when required may result in loss of adequate brake torque and potential injury to personnel or damage to equipment. Be certain to inspect the brake periodically to evaluate for wear, and adjust as necessary.

4.2.1 Brake Inspection and Evaluation

To determine when brake adjustment is required, the brake should be evaluated as follows:

4.2.1.1 Visually inspect for friction material wear.

The friction material is fully worn when the wear has reached the bottom of the wear groove as shown in **Figure 5.**

- If fully worn - replace the material and evaluate the condition of the mating wear surface.

- If the wear limits of any of the friction discs or blocks have not been reached, determine if brake adjustment is required by proceeding to the next steps.

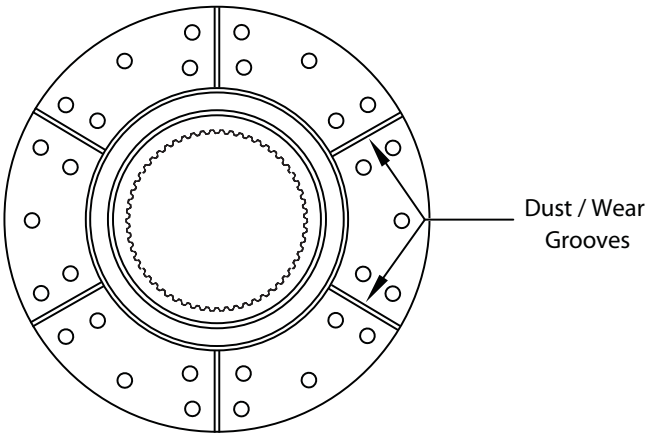

Figure 5 : Illustration of dust / wear grooves

4.2.1.2 **Measure for brake wear:**

(a) Ensure that the load that the brake supports will be properly secured from possibility of movement when no pressure is being applied to the brake(s) being inspected.

(b) Exhaust all air pressure from the pressure chambers on both ends of the WCSBEP brake being evaluated. Pressurized areas are located in the:

- Cylinder (item 19) and
- Mounting Flange (item 112).

If more than one WCSBEP brake is used in the driveline, exhaust all air pressure from those brakes also.

Note : Follow the recommendations of the control system manufacturer to ensure that no air pressure is trapped in the brake or control system, and that the control system has been safely isolated from the brake while performing inspections.

(c) Verify that the air pressure has been fully exhausted from these chambers by checking any in-line gauges (they should read zero pressure), and also by inspecting specific gaps between components as noted below. Refer to **Figures 6 and 6a** for the corresponding gap locations.

Pressure in the cylinder (item 19) has been exhausted if the measured gap Z is greater than zero, and there is no clearance between each side of the disc (item 119) and the corresponding friction material.

Pressure in the mounting flange (item 112) has been exhausted if gap Z-2, located between the mounting flange and the pressure plate (item 116) is closed and gap W is greater than zero.

(d) Measure gaps between the components at positions W, X, Y-1, and if applicable, Y-2, and Y-3. See **Figures 6 and 6a** for the location of those gap positions.

For reference:

The W-gap is the measurement between the end plate (item 117) and the stop plates (item 125) and is used to determine when adjustment of the water-cooled section of the brake is required. This gap will increase as the brake wears.

The X-gap is the measurement between the end plate (item 117) and the pressure plate sub-assembly (item 13) and is used to determine when adjustment of the air-cooled section of the brake is required. This gap will decrease as the brake wears.

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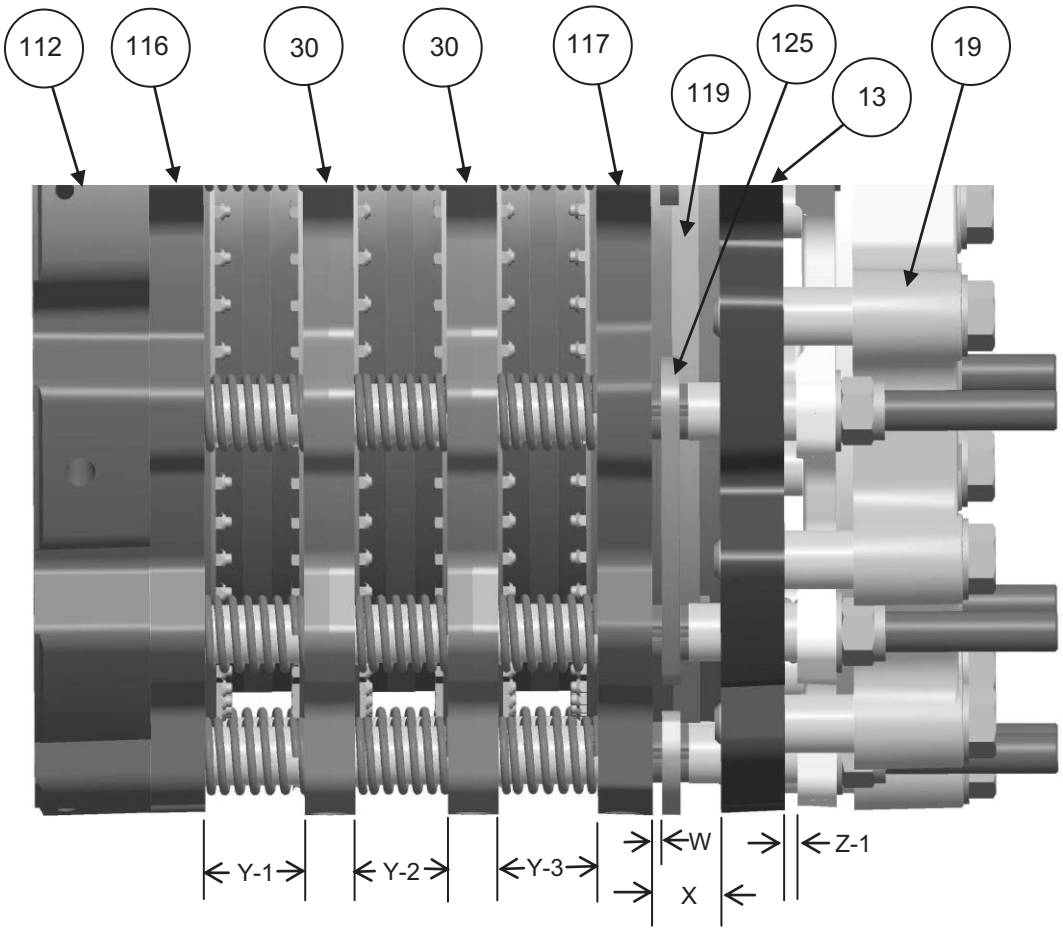

Figure 6 : WCSBEP W, X, Y and Z-1 Gap Locations

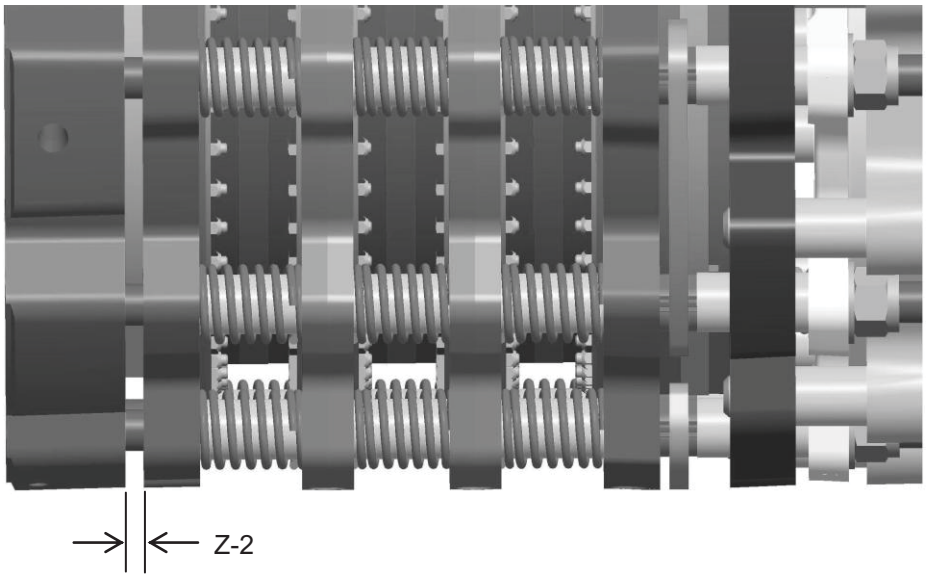

Figure 6a : WCSBEP Z-2 Gap Locations

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The Y gaps are measurements between the various wear plate sub-assemblies and are used to help evaluate the wear of the water-cooled friction discs and wear plates. These gaps will decrease as the brake wears. The wear limit for each of the Y gaps is the same for Y-1, Y-2 or Y-3.

Y-1 is the measurement between the mounting flange (item 116) and the reaction plate (item 30).

Y-2 is the measurement between the reaction plate (item 30) and the adjacent reaction plate (item 30). The Y-2 gap is found only on brakes that have three or more `water-cooled' discs.

Y-3 is the measurement between the reaction plate (item 30) and the end plate (item 117).

(e) Record the W, X, Y-1, Y-2, and Y-3 values measured for each of the gaps, and compare them against the values listed in Table 10.

(f) If the value measured for any Y gap (Y-1, Y-2, Y3) is equal to or less than the Y-min value, the brake should be removed from service and repaired with new wear components.

(g) If the value measured for all Y gaps (Y-1, Y-2 or Y-3) is greater than the Y-min value, proceed to evaluate the measurement for gap W as follows:

(h) If the measurement for gap W is equal to or greater that the W_{adjust} value shown on Table 10, wear adjustment is required. Adjust the brake per the procedures listed in section 4.2.2. If it is found that no wear spacers (item 29) exist between the clamp tube (item 12) and stop plate (item 125) before adjustment is attempted, all wear adjustments have been previously performed in the water-cooled section of the brake, and brake overhaul is required.

(i) If the gap measured for gap X is equal to or less than the X_{adjust} value, wear adjustment is required. Adjust the brake per the procedures listed in section 4.2.2. If it is found that no wear spacers (item 29) exist between the clamp tube (item 124) and stop plate (item 125), all wear adjustments have been previously performed in the air-cooled section of the brake and replacement of the friction discs (item 118) and disc (item 119) may be required. Remove the brake from service and evaluate the condition of those components, using Table 10 as a reference.

4.2.2 Adjustment Procedure

Wear adjustment can be conducted without full disassembly of the WCSBEP tensioner.

⚠ Warning

Before performing any maintenance work on the WCSBEP unit, make sure that the machinery will remain in a safe position. Failure to do so could result is serious injury or possibly death.

4.2.2.1 Wear spacers should be removed in complete sets only (one from each stud location). Mark the spacers to be removed to avoid confusion during removal.

Note : For wear adjustment of the spring set brake (gap X), remove spacers closest to the short clamp tubes (124). For adjustment of the water-cooled tensioner (gap W), remove spacers closest to the long clamp tubes (12).

⚠ Warning

Removal of spacers in quantities other than complete sets (layers) will result in severe damage to WCSBEP components during reassembly, and could cause the brake to not function properly.

4.2.2.2 If so equipped, remove the support bracket from the cylinder (19) end of the unit.

4.2.2.3 Loosen the locknuts (18) - and sleeve nuts (106) if applicable - **ONE TURN AT A TIME** and in an alternating (cross wise) pattern. Loosen each locknut only two or three turns.

⚠ Caution

The locknuts (18) must not be loosened unless the hex head screws (20) are in place.

4.2.2.4 Wear spacers are slotted to allow for in-place removal. Using a narrow chisel wedged between the stud and the spacer, as shown in **Figure 7**, wedge / pry the wear spacer until it fractures and is clear to be removed from the stud. Repeat for the remaining spacers in the set that is to be removed.

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TABLE 10 W, X, Y and Z Gaps - Inches (mm)								
Disc Size	**Qty of WC Discs**	**W_{new}**	**W_{adjust}**	**X_{new}**	**X_{adjust}**	**X_{min}**	**Y_{min}**	**$Z\text{-}1_{new}$**
36	1	.100/.140 (2,54/3,56)	.370 (9,40)	2.392 (60,75)	2.142 (54,40)	1.892 (48,06)	2.25 (57,15)	.200/.280 (5,08/7,11)
	2	.200/.280 (5,08/7,11)	.490(12,45)					.300/ .420 (7,62/10,67)
	3	.300/ .420 (7,62/10,67)	.610(15,50)					.400/ .560 (10,16/14,22)
* Minimum gap between reaction plates is 2.03" (51,56)								

Record of Wear Measurements							
Gap:	**W**	**X**	**Y-1**	**Y-2**	**Y-3**	**Z-1**	**Z-2**
Date:							
Date:							
Date:							
Date:							
Date:							
Date:							
If recorded value is	Equal or greater than **W_{adjust}**	Equal or less than **X_{adjust}**	Greater than **Y_{min}**			Greater than Zero	Equal to Zero
Then	Adjust	Adjust	Inspect friction disc condition. Note: If measured value is less than Y_{min}, rebuild the brake.			Check Z-2	OK to check for wear

⚠ Warning

Be sure to collect all wear spacers when removed. Spacers lodging in between tensioner components could prevent the tensioner from properly engaging or releasing.

4.2.2.5 While supporting the weight of the cylinder/spring housing/pressure plate assembly, tighten the locknuts (18) - and sleeve nuts (106) if applicable - ONE TURN AT A TIME and in a crosswise pattern, until the spring housing is seated tightly against the clamp tubes. Torque the locknuts and sleeve nuts to the appropriate value. See Table 3.

⚠ Warning

The locknuts (18) and sleeve nuts (106) must be tightened gradually and evenly to prevent damage to the brake components.

4.2.2.6 Reinstall the support bracket if required. Secure the bracket onto the sleeve nuts using flat washers (17) and locknuts (18). Tighten the locknuts to the value listed in Table 3. Shim the base of the support bracket as required. Install and tighten fasteners as required to secure the bracket into position.The locknuts (18) must be tightened gradually and evenly to prevent damage to the brake components.

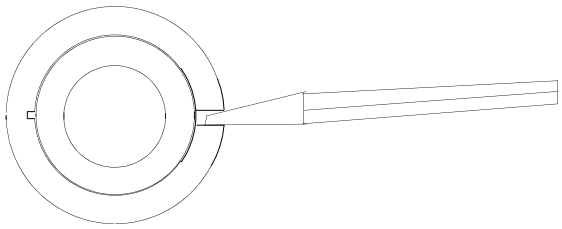

Figure 7 : Removing wear spacers

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⚠ Warning

Ensure that the support bracket does not interfere with or bind on the cylinder (19). Interferences could prevent the brake from properly engaging or releasing.

4.2.2.7 Restore any piping or covers removed prior to operating the tensioner.

4.3 Disassembly Procedures

⚠ Warning

Ensure that the machinery is and will remain in a safe position prior to loosening fasteners or removing the tensioner.

4.3.1 Disconnect the air supply lines and water lines from the tensioner.

4.3.2 Remove the fasteners that secure the tensioner (and support bracket, if applicable) to the mounting structure.

4.3.3 Using soft slings, rig the tensioner and slide the WCSBEP off of the gear. Avoid placing slings or straps directly on the release springs (34).

4.3.4 Transport the tensioner to a clean working area and position the unit on a flat surface with the mounting flange (112) facing down.

4.3.5 If the gear (28) requires replacement, remove it from the shaft with a portable jack, using the threaded holes in the end of the gear for puller holes. Heating may be required to ease removal. Replace the gear and install per Section 2.2.

4.3.6 Match-mark the mounting flange (112), pressure plate (116), reaction plates (30), end plate (117), pressure plate (13), spring housing (16), and cylinder (19) to one another prior to disassembly to adequately show the proper orientation of components to one another.

4.3.7 Loosen the locknuts (18) - or sleeve nuts (106) - **ONE TURN AT A TIME** and in sequence until the release spring force is relieved.

⚠ Caution

The locknuts (18) must not be loosened unless the screws (20) are in place retaining brake spring tension.

4.3.8 Lift the cylinder, spring housing, and pressure plate off of the studs as an assembly. Set the assembly aside on a clean, level area, making sure to avoid damaging the friction material surface.

4.3.9 Continue removing the remaining components if required.

4.3.10 Inspect all components using the wear limits in Table 9 as a reference.

4.3.11 For friction lining replacement refer to Section 4.4.

4.3.12 For wear plate replacement refer to Section 4.5.

4.3.13 Refer to Section 4.6 to replace seals.

4.3.14 For spring replacement, refer to Section 4.7.

4.3.15 Assemble the tensioner per Section 4.9.

⚠ Caution

After replacement of friction material, a minimum wear-in period of four hours at 50% of the rated horsepower is recommended for the friction couple to achieve rated torque.

4.4 Friction Material Replacement (Sizes 36WCSBEP)

Note : When replacing friction material, it is recommended that the mating wear surface be inspected for wear. A light touch up of the wear surfaces may be performed to remove high spots or burrs if desired, but is typically not necessary. See Table 9 for wear limits.

4.4.1 Refer to Section 6.0 for the friction disc replacement part numbers.

⚠ Caution

Use only genuine, Airflex friction material. Use of material not of Airflex origin may result in unpredictable performance.

4.4.2 Disassemble the tensioner as per Section 4.3.

4.4.3 Remove the old screws and discard the old friction material.

Note : Use of a pinpoint torch to heat the screws and soften the Loctite® will ease removal of the screws.

4.4.4 Clean any corrosion etc. from the friction disc core or mounting surfaces.

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4.4.5 Position the new friction material to align the screw holes. Apply Loctite® #262 to the screw threads and tighten the screws to the proper torque value. For water-cooled disc assemblies, tighten screws to 15 ft-lb (20Nm). Screws securing the air cooled brake friction discs (118) or blocks mounted on the pressure plate (13) and end plate subassembly (117) should be tightened to 20 ft-lb (27 Nm) after application of Loctite® #262 to the screw threads. Install the screws in an even, crosswise pattern. Screws in friction blocks should be installed from the centermost position in the block, then progressing towards the outer edges of the block. One at a time, install and torque each screw immediately after application of Loctite® then proceed to the next screw.

⚠ Warning

Loctite® may cure prior to properly tightening the screw if not tightened to the proper torque value immediately after installation.

⚠ Caution

Use only Airflex-supplied screws.

⚠ Caution

Loctite® #262 must be shaken prior to application.

⚠ Caution

Loctite® #262 may irritate sensitive skin. Refer to the product label for proper safety precautions.

4.4.6 After replacement of friction material, assemble the tensioner per Section 4.9. Observe wear-in procedures during start-up per Section 3.0, Operation.

4.5 Wear Plate Replacement

Note : When replacing wear surfaces, it is recommended that the mating friction material be replaced.

4.5.1 Disassemble the tensioner per Section 4.3.

4.5.2 Remove the screws and locknuts holding the wear plates and remove the wear plates. If the wear plates cannot be easily lifted off, gently tap the O.D. to break the gasket seal.

⚠ Caution

Do not attempt to break the gasket seal by prying between the wear plate and housing. Damage to the sealing surfaces may occur.

4.5.3 Inspect the water passages and, if necessary, use a wire brush to clean them. If repainting is necessary, sand blast the water passages and paint the surfaces with PLASITE® Epoxy #9052 Polyamine coating. Dry film thickness should be 8 to 10 mils (0.2 to 0.3 mm). Be careful not to allow the paint to get into the seal grooves or onto the face of the support nubs.

⚠ Caution

If nubs in the water cavity are severely corroded, wear plates may not be properly supported. Replace the pressure plate, reaction plate or mounting flange, if necessary.

⚠ Caution

Follow manufacturer's instructions and proper safety precautions for application of epoxy coatings.

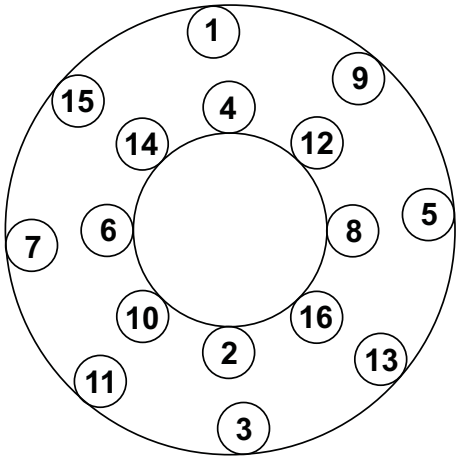

Figure 8 : Wear plate bolt tightening sequence

4.5.4 Assemble with Gasket Tape

Note : The Pressure Plate (14), Reaction Plate (s) (31) and End Plate (117a) will be referred to as IRON in the following paragraphs. Refer to **Figure 14** for item number references shown in parenthesis (#).

4.5.4.1 Preparation and cleaning the IRON: Ensure that the IRON surface is smooth and free of scale, burrs and corrosion. Thoroughly clean both the inner and outer lands which will receive the gasket. Use a solvent based cleaner such as acetone, mineral spirits, or a general-purpose wax/oil/grease remover, turning the wipe until it is free of new dark debris. Finish the cleaning process by blowing off lint on the sealing surface.

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⚠ Caution

Follow manufacture's instructions and proper safety precautions for the use of solvent based cleaners (Acetone, mineral spirits, or general-purpose wax/oil/grease remover).

4.5.4.2 Preparation and cleaning the Copper Wear Plate:

Ensure that the wear plate surface is smooth and free of burrs and corrosion. Thoroughly clean both the outer and inner areas which will be in contact with the gasket tape. Use a solvent based cleaner such as acetone, mineral spirits, or a general-purpose wax/oil/grease remover. Finish the cleaning process by blowing off lint on the sealing surface.

⚠ Caution

Follow manufacture's instructions and proper safety precautions for the use of solvent based cleaners (Acetone, mineral spirits, or general-purpose wax/oil/grease remover).

4.5.4.3 Applying the Gasket Tape to the IRON:

a) Start with the sealing area nearest to the inner diameter on the IRON. Remove the adhesive backing on the gasket tape a little at a time to prevent the adhesive from picking up dirt during installation. Start by positioning one end of the tape and at the centerline of a bolt hole as shown in **Figure 9**, using the edge of the water cavity as a guide, as shown in **Figure 10**. Proceed to apply the tape on the sealing surface following a smooth circular path, being sure to press the tape in place. Note that the tape will cover the machined groove that is located between the water cavity and bolt holes.

b) After the gasket tape has been placed around the entire circumference, overlap the starting end of the tape by a minimum of .44" (11.2 mm). See **Figure 11**.

c) Repeat steps (a) and (b) for the outer sealing area nearest to the outer diameter of the IRON, again using the edge of the water cavity as a guide.

⚠ Caution

Before the gasket tape is covered with the wear plate, the sealing surface should be protected to prevent contamination from dust, dirt or oils. No additional cleaning or liquid should be applied to the surface of the IRON or gasket tape

4.5.5 Inspect the new wear plates and remove any scratches or raised edges with very fine sandpaper or steel wool. Position the smoothest side of the wear plate on the sealing surface, being careful to align the holes with those in the IRON.

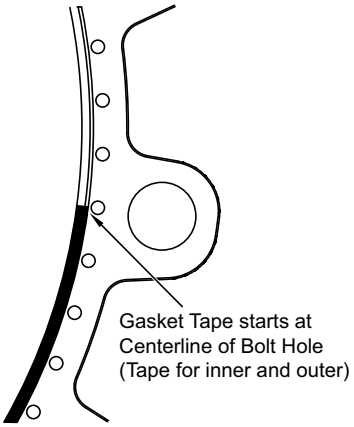

Figure 9 : Start location of gasket tape

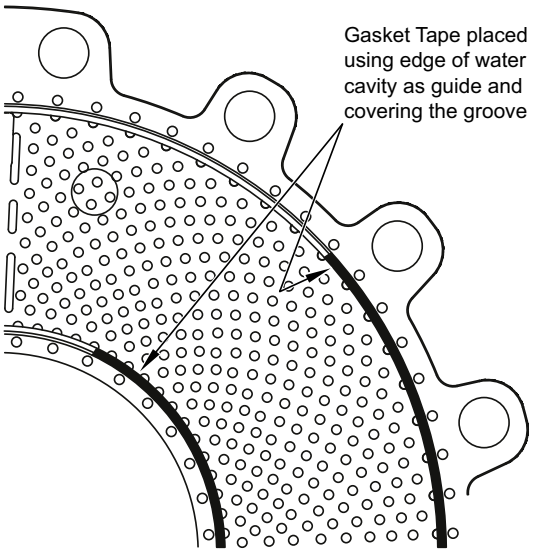

Figure 10 : Placement of gasket tape

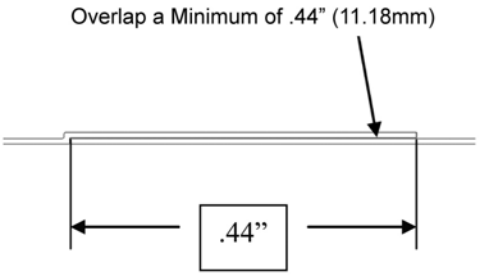

Figure 11 : Overlap of gasket tape

4.5.6 Position the clamp rings over the holes in the wear plates and install the new hex head screws and locknuts provided, securing them finger tight.

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⚠ Caution

To prevent excessive warpage and to ensure a good seal, the following hardware tightening procedure must be followed.

4.5.7 For each wear plate being replaced, follow the tightening sequence shown in **Figure 8** for the first 16 screws. The remaining screws may be tightened in any reasonable crosswise pattern. See section 6.2 for illustrated part lists and Table 3 for tightening torque values.

4.5.8 After completion of the assembly, each water cavity should be checked for leaks.

4.5.8.1 Using lifting straps, suspend each assembly with the water outlet port at the 12 o'clock position. Connect a water supply line to the inlet port (at 6 o'clock position). In reaction plates, plug the remaining inlet port. See Table 5 for water port size.

4.5.8.2 Slowly fill with water to purge all air from water cavities.

4.5.8.3 Install pipe plug(s) in the outlet port(s) and apply appropriate water pressure 60 psig (4.1bar) for size 36 WCSBEP units measured at the inlet. Maintain this pressure for a minimum of 30 minutes.

4.5.8.4 Check for leakage at O.D. and I.D. seal areas. **NO** leakage is allowed.

4.5.8.5 If the assembly leaks, check the torque on each screw and re-test. If leaks still occur, the wear plate(s) may be damaged. Repeat procedure from 4.5.1.

4.5.8.6 Follow steps in Section 4.9 to reassemble the tensioner.

4.6 Cylinder Seal Replacement

Note : If seals in the mounting flange/cylinder (112) require replacement, full disassembly of the tensioner is required. See Section 4.3.

4.6.1 Disconnect the air supply lines and remove the screws (20), washers (17) and spacer tubes (27) attaching the cylinder (19) to the pressure plate (13).

4.6.2 Carefully slide the cylinder off of the spring housing (16) or piston (33) out of the mounting flange / cylinder (112).

⚠ Caution

Do not use compressed air to remove the cylinder from the spring housing.

4.6.3 Remove the cylinder seals from the spring housing (16) or piston (33) and thoroughly clean the seal grooves in the spring housing or spring housing.

4.6.4 Insert new seals into the grooves, noting the orientation of the seals per **Figure 12**.

Note : Some assemblies might have used a one piece bi-directional lip seal. That type of seal has been superseded by the use of TWO seals that fit back-to-back as shown in **Figure 12**.

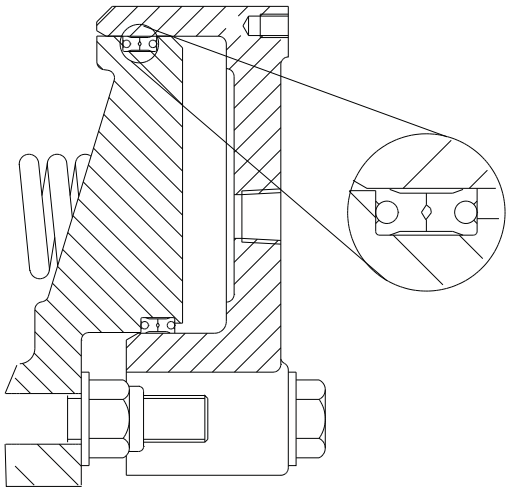

Figure 12 : Cylinder Seal Orientation

4.6.5 Carefully examine the seal surfaces in the cylinder or mounting flange / cylinder. If the surfaces have worn to point as indicated on Table 9, the cylinder must be replaced. Small nicks or scratches must be sanded smooth to prevent air leakage.

Note : If the tensioner was completely removed and disassembled to replace seals, refer to Section 4.9 to assemble.

4.6.6 Lubricate the seal surfaces in the cylinder with Dow Corning® 55 O-ring lubricant and carefully slide the cylinder onto the spring housing. Take special care to avoid damaging the seal lips.

4.6.7 Attach the cylinder to the pressure plate with the screws, washers and spacer tubes removed in 4.6.1. Use Loctite® Locquic® Primer Grade "T" to clean and prepare the screw threads and install with Loctite® #262. Using a crosswise pattern, torque the screws to the value shown on Table 3.

⚠ Warning

Loctite® Primer "T" contains harmful vapors. Refer to the product label for proper safety precautions.

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⚠ Caution

Loctite® #262 must be shaken prior to application.

⚠ Caution

Loctite® #262 may irritate sensitive skin. Refer to the product label for proper safety precautions.

4.6.8 If mounting flange / cylinder seals have been replaced, re-assemble the tensioner / brake per Section 4.9.

4.6.9 Install air lines and air test the assembly for seal leakage per the following:

Apply 120 psi (8.2 bar) to an open port in the cylinder (19) to disengage the spring-set brake and check for release cylinder leakage. Apply 120 psi (8.2 bar) to the larger of the two ports in the mounting flange / cylinder (112) and check for large cylinder seal leakage. Allow the smaller port in the mounting flange / cylinder to remain open to check for potential leakage from the large cylinder to the small cylinder in the mounting flange / cylinder. Shut off the air supply and check for pressure drop from the cylinders. If air pressure does not drop below 100 psi (6.8 bar) within 10 minutes, the seals have been properly installed.

Continue the test by releasing the air pressure in the larger port in the mounting flange cylinder, and applying 120 psi (8.2 bar) to the smaller of the two ports in the mounting flange. The larger port should remain open to atmosphere. Apply 120 psi (8.2 bar) to the cylinder (19) to disengage the spring set brake. Check for leakage from the small cylinder to the large cylinder in the mounting flange / cylinder. Shut off the air supply and check for pressure drop from the cylinders. If air pressure does not drop below 100 psi (6.8 bar) within 10 minutes, the seals have been properly installed.

4.7 Spring Replacement

4.7.1 Remove the tensioner as an assembly, and disassemble per Section 4.3.

4.7.2 Match mark the cylinder (19), spring housing (16), and pressure plate subassembly (13) to one another, to ease reassembly.

4.7.3 With the cylinder (19) facing up, disassemble the cylinder/spring housing subassembly by loosening the hex head screws (20) **ONE TURN AT A TIME**, following a crosswise sequence, until the spring force is relieved. Remove the hex head screws and washers.

⚠ Caution

Failure to loosen the screws (20) evenly and in small increments as described may cause the screws or cylinder to bind.

4.7.4 Lift and set aside the spring housing (16) and cylinder (19) as a subassembly to expose the springs. Note the locations of the springs and spring retainers (53) - if applicable - for reassembly purposes.

4.7.5 Inspect the springs for distortion and check the free height. If the free height of any spring is less than the value shown on Table 9, the entire set of springs must be replaced.

4.7.6 Reassemble the tensioner by following the procedures in Section 4.9., beginning with section 4.9.20.

⚠ Caution

The cylinder, spring housing and end plate, should not be re-assembled as a separate subassembly. Improper assembly procedures may result in uneven contact of the friction material with the disc (119), resulting in low stopping torque.

4.8 Reaction Plate Bushing Replacement (Size 36 only)

4.8.1 Disassemble per section 4.3.

4.8.2 Refer to Table 9 to determine if the reaction plate bushings (54) require replacement.

4.8.3 Heat up the area around each bushing to soften the Loctite®. Drive out the old bushings.

4.8.4 Clean the bores in the mating component, removing any residual Loctite®.

4.8.5 Apply Loctite® #RC601, 635 or 680 to the bushing O.D. and mating hole in the reaction plate using a swab. Apply enough liquid to entirely fill the space between the parts. Install the bushings by twisting the bushing while pushing it down, until it is flush with the casting surface. Inspect to see that a ring of liquid adhesive is visible at the parting line. Reapply Loctite if required. Allow the Loctite to cure for 15 minutes before moving the sub assembly.

4.8.6 Assemble the tensioner per section 4.9, as required.

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4.9 Assembly Procedures

4.9.1 Position the mounting flange / cylinder (112) on a flat, level surface, mounting face down. Note the location of the cylinder inlets in the mounting flange as the "6 o-clock" position.

4.9.2 Lubricate the seals (21)(23)(114) with Dow Corning 55 M O-ring lubricant, and install them into the seal grooves on the piston (33). Note the orientation of the seal lips, per **Figure 12**. Lubricate the seal surfaces in the mounting flange / cylinder (112) and evenly insert the piston into the mounting flange / cylinder.

4.9.3 Install the studs (6) into the mounting flange (112). The stud end with the shorter length of threads is to be assembled into the mounting flange. Clean the stud end to be assembled by applying Loctite Loc-Quic® Primer Grade "T" to the threads. After the threads have dried, apply Loctite® #271 to the threads and assemble the stud until it bottoms in the threaded hole in the mounting flange. Repeat for the remaining studs.

⚠ Warning

Loctite® Primer "T" contains harmful vapors. Refer to the product label for proper safety precautions.

4.9.4 Install a clamp tube (12) over each stud.

4.9.5 With the wear plate facing up, lower the pressure plate subassembly (116) over the clamp tubes, noting the position of the water inlet in relation to the ports in the mounting flange / cylinder. The inlet ports should be as close as possible to the "6 o-clock" position noted in 4.9.1.

4.9.6 Pre-fill the grease channel in the friction disc subassembly (7) splines with MOLUB-ALLOY® 936SF grease, or equivalent, as shown on **Figure 3**.

TABLE 11
Tensioner Wear Spacers

Size	Qty Required
336WCSBEP	3
436WCSBEP	4

4.9.7 Lower a friction disc subassembly (7) onto the pressure plate wear surface. Center the friction disc on the pressure plate (116).

4.9.8 Place a release spring (34) over every clamp tube. For single disc tensioners, proceed to section 4.9.12.

4.9.9 On multiple disc assemblies, lower a reaction plate subassembly (30) over the clamp tubes, noting the position of the water inlet in relation to the ports in the pressure plate (116).

4.9.10 Assemble a release spring (34) over every clamp tube, and lower a friction disc subassembly (7) onto the reaction plate. Align the disc splines with those in the previous disc assembled to ease installation after assembly.

4.9.11 Repeat Sections 4.9.9 through 4.9.10 until all reaction plates, friction discs and reaction springs are installed.

4.9.12 Lower the end plate subassembly (117) over the clamp tubes, noting the orientation of the water inlets.

4.9.13 Assemble the wear spacers (29) over the studs (6). Refer to Table 11 for the quantity required at this location (adjacent to clamp tubes (12)) on each stud.

4.9.14 Assemble the friction discs or blocks (118) to the end plate subassembly (117) and pressure plate (13) per the following:

Position the friction material to align the screw holes. Apply Loctite® #262 to the screw threads and tighten the screws (121) to 20 ft-lb (27 Nm). Install the screws in an even, crosswise pattern. Screws in friction blocks should be installed from the centermost position in the block, then progressing towards the outer edges of the block. One at a time, install and torque each screw immediately after application of Loctite®, then proceed to the next screw.

⚠ Warning

Loctite® may cure prior to properly tightening the screw if not tightened to the proper torque value immediately after installation.

⚠ Caution

Use only Airflex-supplied screws.

⚠ Caution

Loctite® #262 must be shaken prior to application.

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⚠ Caution

Loctite® #262 may irritate sensitive skin. Refer to the product label for proper safety precautions.

4.9.15 Lower the disc (119) onto the friction material on the end plate subassembly (117), centering it on the friction blocks or disc. Align the splines with those in the tensioner friction disc subassemblies (7).

4.9.16 Assemble the stop plates (125) over adjoining pairs of studs so that they rest against the end plate or wear spacers.

4.9.17 Install the remaining wear spacers (29) over the studs. One spacer should be placed over each stud. See **Figure 1**.

4.9.18 Slide the clamp tubes (124) over the studs.

4.9.19 Lower the pressure plate (13) over the clamp tubes (124), resting the friction material face against the disc (119).

4.9.20 Install the springs in a symmetrical pattern on the pressure plate subassembly (13), distributing them as evenly as possible. Locate the springs over bosses or in the spring pockets in the pressure plate, as shown in **Figure 13**. If applicable, position the spring retainers (53) on top of the springs to hold the springs into position.

4.9.21 Lower the spring housing and cylinder over the springs and spring retainers, if applicable, aligning the match marks made during disassembly. Be sure to not overlap spring retainers such that they interfere with the ribs in the spring housing (16) when assembled.

⚠ Caution

Interference of the spring retainers with the casted ribs in the spring housing will damage the spring retainers and may prevent proper positioning of the springs.

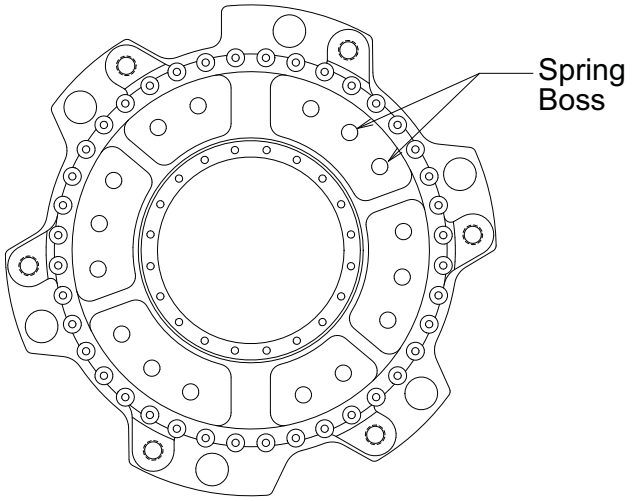

Figure 13 : Spring Locations

4.9.22 Lubricate the ends of the studs (6) with 30 weight oil or an anti-seize compound, and assemble the locknuts (18) and flat washers (17) onto the studs. Tighten the nuts in an even crosswise pattern - one turn at a time - to evenly compress the springs. Tighten the nuts to the final tightening torque listed on Table 3.

Note : If sleeve nuts (106) are used to accommodate a support bracket, install the sleeve nuts onto the studs in place of the locknuts at or near the "6 O-clock" position, tightening them as required.

⚠ Caution

The locknuts (18) and sleeve nuts (106) must be tightened gradually to prevent damage to the brake components.

4.9.23 Lubricate the seals (21)(23) with Dow Corning 55M O-ring lubricant, and install them into the seal grooves on the spring housing (16).

Note the orientation of the seal lips, per **Figure 12**.

4.9.24 Lubricate the seal surfaces in the mounting cylinder (19) and lower the cylinder onto the spring housing. Orient the cylinder so that the Eaton logo is near the "12 O-clock" position, in-line with the water outlets.

4.9.25 Position the spacer tubes (27) in-line with the bolt holes in the cylinder, and install the hex head screws (20) and lock washers (17). Tighten the screws in a crosswise pattern **ONE TURN AT A TIME** until the spacer tubes are clamped between the cylinder and pressure plate. Make sure the cylinder slides over the seals properly, to avoid damaging the seal lips.

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4.9.26 Remove the screws (20) one at a time, apply Loctite® #262 to the screw threads, and reinstall the screw, tightening to the value shown in Table 3. Repeat for the remaining screws.

⚠ Warning

Loctite® may cure prior to properly tightening the screw if not tightened to the proper torque value immediately after installation.

⚠ Caution

Loctite® #262 must be shaken prior to application.

⚠ Caution

Loctite® #262 may irritate sensitive skin. Refer to the product label for proper safety precautions.

4.9.27 After assembly, check gaps "W" and "Z-1" to ensure that the brake will have adequate running clearances when released. Refer to **Figure 6** and Table 10. Additional machining of friction discs or wear plates may be required to achieve proper running clearances if gaps Wnew and Znew are not found to be within the ranges shown on Table 10. Correct as required.

4.9.28 Prior to installation, air test the cylinder seals for leakage per section 4.6.9.

4.9.29 Install the WCSBEP tensioner per Section 2.0.

5.0 ORDERING INFORMATION / TECHNICAL ASSISTANCE

5.1 Equipment Reference

5.1.1 In any correspondence regarding Airflex equipment, refer to the information on the product nameplate and call or write:

Eaton Corporation
Airflex Division
9919 Clinton Rd.
Cleveland, Ohio 44144

Tel: (216) 281-2211
Fax: (216) 281-3890
Internet: www.eaton.com/airflex

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PLASITE® is a registered trademark of Carboline Company.

MOLUB-ALLOY® is a trademark of Castrol Industrial Lubricants.

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6.0 PARTS LIST

Caution

The replacement kits in this manual are for the enhanced 36WSCBEP ONLY. For part reference and replacement kits for the previous style 36WSCB, refer to manual WSB 11200.

6.1 Parts (Standard / MID-CO)

Item	Description	236 WCSBEP 146539C		336 WCSBEP 146544C		436 WCSBEP 146549C	
		Part Number	Qty	Part Number	Qty	Part Number	Qty
6	Stud	307111-18	16	307111-17	16	307111-15	16
7	Friction Disc Sub Assembly*	515401	1	515401	2	515401	3
12	Clamp Tube	515389-06	16	515389-07	16	515389-08	16
13	A/C Pressure Plate	514391	1	514391	1	514391	1
16	Spring Housing	514125	1	514125	1	514125	1
17	Flat Washer	000067 x 0042	32	000067 x 0042	32	000067 x 0042	37
18	Locknut	000110 x 0075	16	000110 x 0075	16	000110 x 0075	16
19	Cylinder	513988	1	513988	1	513988	1
20	Hex Head Screw	417178-01	16	417178-01	16	417178-01	16
21	Seal	000402 x 0005	4	000402 x 0005	4	000402 x 0005	4
22	Outer Spring	416751-07	64	416751-07	64	416751-07	64
23	Seal	000402 x 0006	4	000402 x 0006	4	000402 x 0006	4
27	Spacer Tube	308150-06	16	308150-06	16	308150-06	16
28	Gear (not included with assembly)	416821-####	1	416842-####	1	416676####	1
29	Wear Spacer	308313	32	308313	64	308313	80
30	Reaction Plate Sub Assembly*	---	---	515400-02	1	515400-02	2
33	Dual Piston	514485	1	514485	1	514485	1
34	Release Spring	416751-01	16	416751-01	32	416751-01	48
52	Inner Spring	416751-08	64	416751-08	64	416751-08	64
53	Spring Retainer	416504	16	416504	16	416504	16
105	Pipe Plug	000077 x 0021	1	000077 x 0021	1	000077 x 0021	1
106	Sleeve Nut	---	---	---	---	308242	5
112	Mounting Flange / Cylinder	514507	1	514507	1	514507	1
114	Seal	000402 x 0040	2	000402 x 0040	2	000402 x 0040	2
116	Pressure Plate Sub-Assembly*	515416-01	1	515416-01	1	515416-01	1
117	End Plate Sub-Assembly*	515416-02	1	515416-02	1	515416-02	1
118	Friction Disc / Block	513396	2	513396	2	513396	2
119	Disc	515336	1	515336	1	515336	1
121	Flat Head Screw	000294 x 0405	72	000294 x0405	72	000294 x 0405	72
122	Pipe Plug	000076 x 0007	5	000076 x 0007	5	000076 x 0007	5
124	Clamp Tube	515389-05	16	515389-05	16	515389-05	16
125	Stop Plate	308312	8	308312	8	308312	8
127	Pipe Plug	000076 x0004	3	000076 x 0004	3	000076 x 0004	3

* - Individual parts breakdown for standard WCSBEP sub-assemblies are in section 6.2
For Item (7) Friction Disc Sub Assembly - See Table 6.2.4
For Item (30) Reaction Plate Sub Assembly - See Table 6.2.1
For Item (116) Pressure Plate Sub Assembly - See Table 6.2.2
For Item (117) End Plate Sub Assembly - See Table 6.2.3

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6.2 Sub-Assemblies (Standard)

6.2.1 WCSBEP Reaction Plate Sub-Assemblies				
Item		MODEL	36WCSBEP	
		Part Description	Part No.	Qty
30		**Sub Assembly Part #**	515400-02	1
	3	Wear Plate	417335	2
	4	Screw	000153 x 0843	108
	5	Nut	000153 x 0844	108
	31	Reaction Plate	513989	1
	50	Inner Support Ring	414032-01	12
	51	Outer Support Ring	414033-01	18
		PTFE Gasket O.D.	308581-01	2
		PTFE Gasket I.D.	308581-01	2

6.2.2 WCSBEP Pressure Plate Sub-Assemblies				
Item		MODEL	36WCSBEP	
		Part Description	Part No.	Qty
116		**Sub Assembly Part #**	515416-01	1
	3	Wear Plate	417335	1
	4	Screw	000153 x 0842	72
	4a	Screw	000153 x 1216	36
	5	Nut	000153 x 0844	108
	14	Pressure Plate	514541	1
	50	Inner Support Ring	414032-01	6
	51	Outer Support Ring	414033-01	9
		PTFE Gasket O.D.	308581-01	1
		PTFE Gasket I.D.	308581-02	1

6.2.3 WCSBEP End Plate Sub-Assemblies				
Item		MODEL	36WCSBEP	
		Part Description	Part No.	Qty
117		**Sub Assembly Part #**	515416-02	1
	3	Wear Plate	417335	1
	4	Screw	000153 x 0842	72
	4a	Screw	000153 x 1216	36
	5	Nut	000153 x 0844	108
	50	Inner Support Ring	414032-01	6
	51	Outer Support Ring	414033-01	9
	117a	End Plate	514475	1
		PTFE Gasket O.D.	308581-01	1
		PTFE Gasket I.D.	308581-02	1

6.2.4 WCSBEP Friction Disc Sub-Assemblies MID-CO				
Item		MODEL	36WCSBEP (MID-CO)	
		Part Description	Part No.	Qty
7		**Sub Assembly Part #**	515401	1
	8	Friction Block	515388	16
	9	Friction Disc Core	513667	1
	57	Screw	000294 x 0407	144

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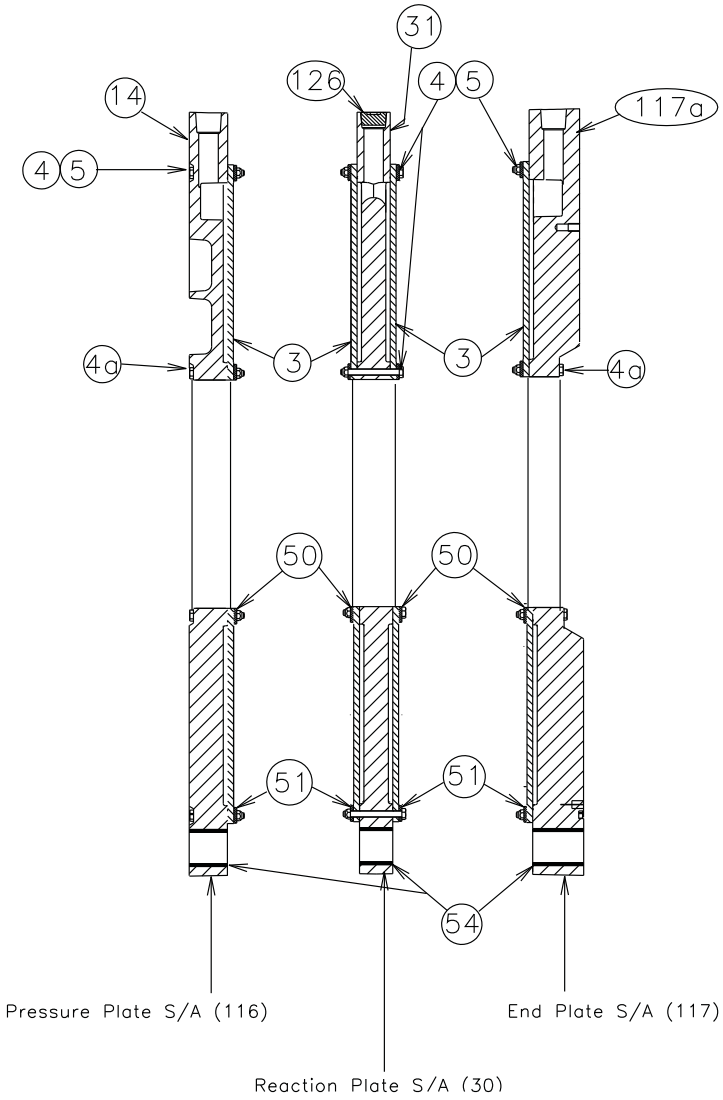

Figure 14 : WCSBEP Sub-Assemblies

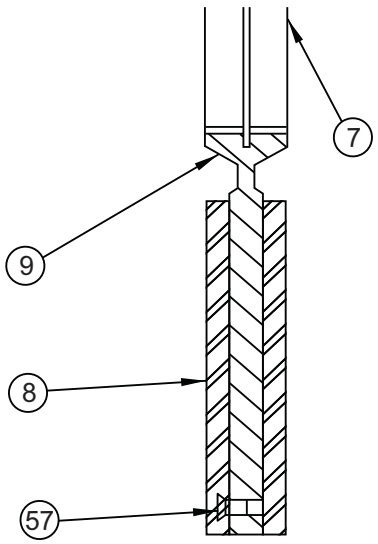

Figure 15 : WCSBEP Friction Disc Sub-Assemblies

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7.0 KITS

7.1 Seal Kit - Dual Piston (For Item #33)

Parts Included in Kit		Lip Seal (Intermediate) (114)		Lip Seal (Inner)(21)		Lip Seal (Outer)(23)		Instruction Sheet	
Model	Kit P/N	Part No.	QTY	Part No.	QTY	Part No.	QTY	Part No.	QTY
36EP	107662CD	000402 x 0040	2	000402 x 0005	2	000402 x 0006	2	204183	1

All kits include one tube of Dow Corning 55 O-ring lubricant (00153X1239)

7.2 Cylinder Seal Kit (For Item #19)

Parts Included in Kit		Seal Lubricant - Ring Lube		Lip Seal (Inner)(21)		Lip Seal (Outer)(23)		Instruction Sheet	
Model	Kit P/N	Part No.	QTY	Part No.	QTY	Part No.	QTY	Part No.	QTY
36EP	107662C	000153 x 1239	1	000402 x 0005	2	000402 x 0006	2	204067	1

7.3 Wear Plate Kits for End Plate and Pressure Plate

Parts Included in Kit		Screw(4)		Screw(4a)		Lock Nut(5)		Wear Plate (3)		Inner Support Ring(50)		Outer Support Ring (51)		PTFE Gasket O.D.		PTFE Gasket I.D.		Instruction Sheet	
Model	Kit P/N	Part No.	QTY	Part No.	QTY	Part No.	QTY	Part No.	QTY	Part No.	QTY	Part No.	QTY	Part No.	QTY	Part No.	QTY	Part No.	QTY
36EP	108133A	000153 x 0842	144	000153 x 1216	72	000153 x 0844	216	417335	2	414032-01	12	414033-01	18	308581-01	2	308581-02	2	204209	1

⚠ Caution

The replacement kits in this manual are for the enhanced 36WSCBEP ONLY. For part reference and replacement kits for the previous style 36WSCB, refer to manual WSB 11200.

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7.4 Wear Plate Kits for Reaction Plate

Parts Included in Kit		Screw(49)		Lock Nut(5)		Wear Plate (3)		Inner Support Ring(50)		Outer Support Ring (51)		PTFE Gasket O.D.		PTFE Gasket I.D.		Instruction Sheet	
Model	Kit P/N	Part No.	QTY	Part No.	QTY	Part No.	QTY	Part No.	QTY	Part No.	QTY	Part No.	QTY	Part No.	QTY	Part No.	QTY
36EP	108133E	000153 x 0843	108	000153 x 0844	108	417335	2	414032-01	12	414033-01	18	308581-01	2	308581-02	2	204209	1

7.5 Friction Disc Kits (WC Standard / Mid-CO)

Parts Included in Kit		Loctite® #242 Sealant		Flat Head Screw (57)		Friction Block (8)		Wear Spacer (29)		Instruction Sheet	
Model	Kit P/N	Part No.	QTY	Part No.	QTY	Part No.	QTY	Part No.	QTY	Part No.	QTY
236EP	108135B	000153 x 1168	1	000294 x 0407	144	515388	16	308313	16	204208	1
336EP	108135BA	000153 x 1168	2	000294 x 0407	288	515388	32	308313	48	204208	1
436EP	108135BB	000153 x 1168	3	000294 x 0407	432	515388	48	308313	64	204208	1

7.6 Friction Disc Kits (WC Corrosion Resistant / Mid-CO)

Parts Included in Kit		Loctite® #242 Sealant		Molub-Alloy #936SF		Flat Head Screw (57)		Friction Block (8)		Wear Spacer (29)		Instruction Sheet	
Model	Kit P/N	Part No.	QTY	Part No.	QTY	Part No.	QTY	Part No.	QTY	Part No.	QTY	Part No.	QTY
236EP	108135C	000153 x 1168	1	000153 x 1182	1	000421 x 0407	144	515388	16	308313	16	204208	1
336EP	108135CA	000153 x 1168	2	000153 x 1182	1	000421 x 0407	288	515388	32	308313	48	204208	1
436EP	108135CB	000153 x 1168	3	000153 x 1182	1	000421 x 0407	432	515388	48	308313	64	204208	1

⚠ Caution

The replacement kits in this manual are for the enhanced 36WSCBEP ONLY. For part reference and replacement kits for the previous style 36WSCB, refer to manual WSB 11200.

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7.7 Friction Disc Kits (AC Standard / Mid-CO)

Parts Included in Kit		Loctite® #242 Sealant		Flat Head Screw (121)		Friction Disc (118)		Wear Spacer (29)		Instruction Sheet	
Model	Kit P/N	Part No.	QTY	Part No.	QTY	Part No.	QTY	Part No.	QTY	Part No.	QTY
36WCSBEP	108136B	000153 x 1168	1	000294 x 0405	72	513396	2	308313	16	204208	1

7.8 Friction Disc Kits (AC Corrosion Resistant / Mid-CO)

Parts Included in Kit		Loctite® #242 Sealant		Molub-Alloy #936SF		Flat Head Screw (121)		Friction Disc (118)		Wear Spacer (29)		Instruction Sheet	
Model	Kit P/N	Part No.	QTY	Part No.	QTY	Part No.	QTY	Part No.	QTY	Part No.	QTY	Part No.	QTY
36WCSBEP	108136C	000153 x 1168	1	000153 x 1182	1	000421 x 0407	72	513396	2	308313	16	204208	1

⚠ Caution

The replacement kits in this manual are for the enhanced 36WSCBEP ONLY. For part reference and replacement kits for the previous style 36WSCB, refer to manual WSB 11200.

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8.0 REVISIONS

Original Publication Date : April, 2010		
Revision Date	**Change**	**Page(s)**

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CE Declaration of Incorporation

MANUFACTURER: Eaton Corporation Airflex Business Unit

ADDRESS: 9919 Clinton Road, Cleveland, OH 44144

PRODUCT DESCRIPTION: Air applied, spring applied and combination air applied spring applied water-cooled brakes

MODEL NUMBER (s):
124WCB2, 124WCBD, 224WCB2, 224WCBD, 324WCB2, 324WCBD, 424WCB2, 424WCBD, 136WCB2, 136WCBD, 236WCB2, 236WCBD, 336WCB2, 336WCBD, 436WCB2, 436WCBD, 148WCB2, 148WCBD, 248WCB2, 248WCBD, 348WCB2, 348WCBD, 448WCB2, 448WCBD

124WCS, 224WCS, 324WCS, 424WCS, 136WCS, 236WCS, 336WCS, 436WCS

224WCSB, 324WCSB, 424WCSB, 236WCSB, 336WCSB, 436WCSB, 248WCSB, 348WCSB, 448WCSB

Note: The above listed models are the most common but are not all-inclusive.

APPLICABLE EUROPEAN DIRECTIVES:

Machinery:	98/37/EC
ATEX:	94/9/EC
PED:	97/23/EC

APPLICABLE INTERNATIONAL STANDARDS:

Machinery:	EN292-1, EN954-1, EN1050
ATEX:	EN1127-1, EN13463-1, EN13463-5

The product described in this Declaration of Incorporation complies with the Applicable European Directives and relevant sections of the Applicable International Standards. A manual is provided with this Declaration that contains specific integration requirements and specifications that must be implemented prior to putting this equipment into service; this equipment must not be put into service before being declared in full conformity with the provisions of all Applicable Directives. A Technical Construction File that addresses the EHSR's of the equipment described above is available for inspection by designated bodies.

Authorized Signature: Date: 10-21-09

This Declaration of Incorporation applies only to the equipment described above and is invalid if not reproduced in its entirety

Eaton Corporation
Airfiex Division
9919 Clinton Road
Cleveland, Ohio 44144

EATON PRODUCT WARRANTY

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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Form ML-318
Rev. October 8, 2008