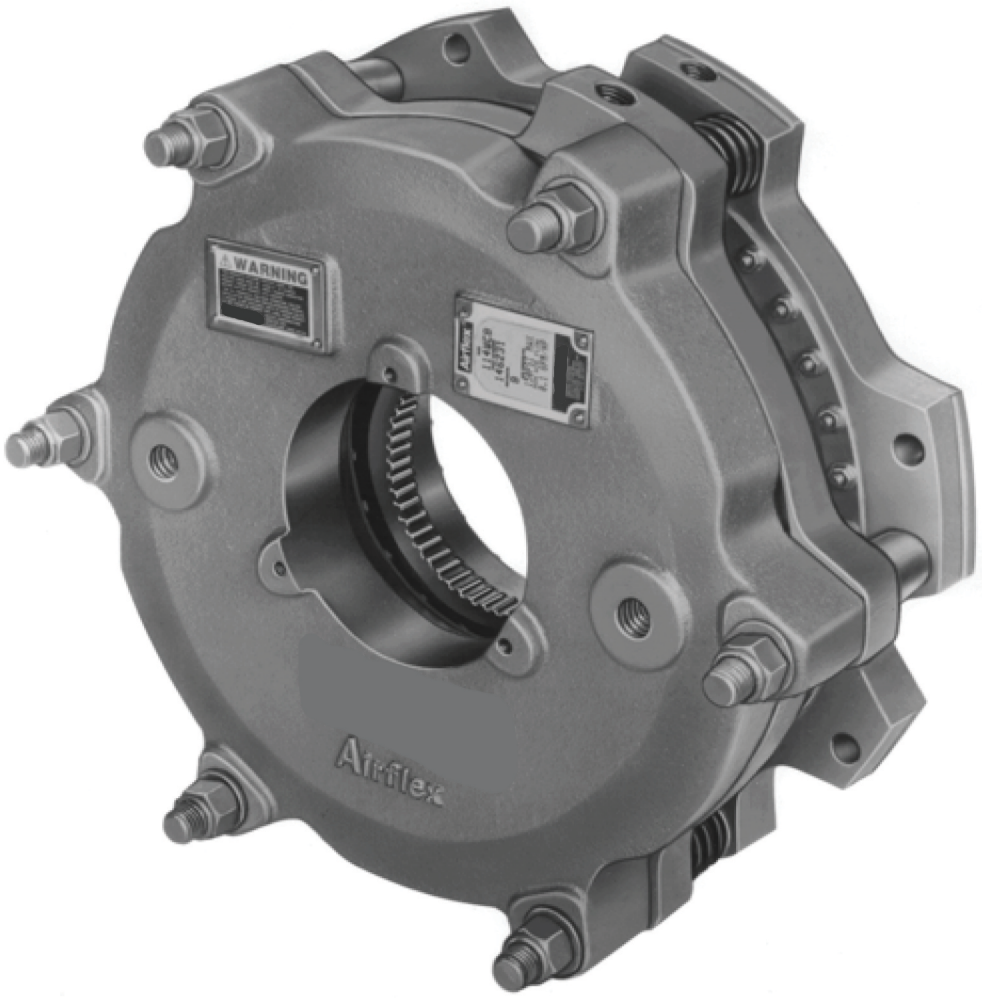
Installation guide

Danfoss Airflex

WCB11076 WCB2 Tensioner /Brake with ORB Coolant Ports



ENGINEERING
TOMORROW

AX445055506678en-000101

WCB2 Tensioner/Brake with ORB Coolant Ports

General Information

⚠ 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.

Note: Part lists in this manual are specifically for WCB2 assemblies that have cooling ports threaded to accept SAE O-ring boss type fittings. If you are maintaining a WCB2 assembly that has cooling ports threaded to accept NPT fittings, refer to manual WCB 11070 for the appropriate part lists or contact the factory for additional information.

⚠ Caution

Use Only Genuine Airflex® Replacement Parts

Danfoss 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 Danfoss warranty. For optimum performance, contact Danfoss.

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WCB2 Tensioner/Brake with ORB Coolant Ports

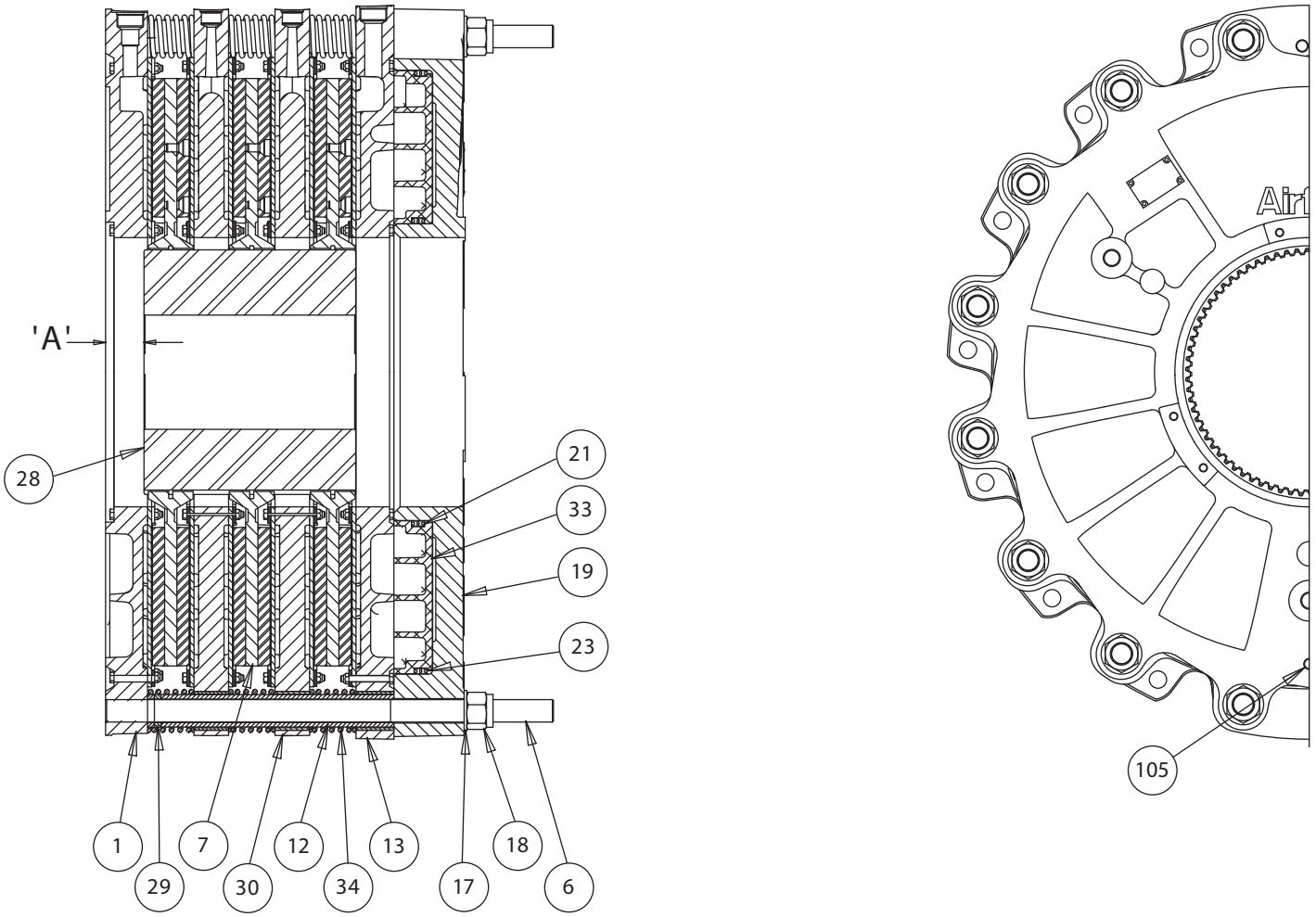


Figure 1

Table 1
Item Description

Item	Description
1	Mounting Flange S/A
6	Stud
7	Friction Disc S/A
12	Clamp Tube
13	Pressure Plate S/A
17	Flat Washer

Item	Description
18	Self Locking Nut
19	Cylinder
21	Seal (Inner)
23	Seal (Outer)
28	Gear (Not Included in P/L)
29	Wear Spacer

Item	Description
30	Reaction Plate S/A
33	Piston
34	Release Spring
105	Pipe Plug

WCB2 Tensioner/Brake with ORB Coolant Ports

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 ⚠.

⚠ **Danger**
Denotes the most serious injury 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 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 procedures by which hazards are to be avoided.

⚠**Danger** ⚠**Warning** ⚠**Caution**

1.1 Description

1.1.1 The Airflex® WCB2 water-cooled tensioner/brake assembly is designed for constant tension applications. It is exceptionally well suited for high inertia stopping and rapid heat dissipation. The design of the WCB2 water-cooled tensioner/brake assembly permits mid-shaft or end-shaft mounting. The rugged construction ensures long, trouble free service.

1.1.2 WCB2 water-cooled tensioner/brake assemblies are available in various sizes and quantities of friction discs assemblies. The model number identifies the number of friction disc assemblies and the nominal disc diameter. For example, 324WCB2 indicates three 24" diameter discs.

1.1.3 When size, such as 36WCB2, 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., 236WCB2, 336WCB2, etc.

1.1.4 All WCB2 tensioner/brake assemblies referred to in this IOM have SAE O-ring Boss (ORB) ports for the coolant inlets and outlets. These ports utilize a straight thread and an O-ring for sealing versus the NPT tapered thread used previously and referred to in IOM WCB 11070. The ORB ports provide superior sealing properties and reduce the risk of damage to the brake during fitting installation.

1.1.5 WCB2 tensioner/brake assemblies can be used with either closed loop or open loop water systems.

1.1.6 This manual includes metric equivalents usually shown in brackets (#) 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 WCB2 tensioner/brake assembly assembly is attached to the machine frame or a reaction bracket.

Air pressure is applied through the ports in the cylinder (19) causing the piston (33) and pressure plate assembly (13) to move towards the mounting flange, compressing the release springs. As the applied pressure increases, the friction disc(s) are clamped between the pressure plate and mounting flange, stopping or controlling the shaft the discs are mounted on. Modulation of air pressure then controls applied torque of the WCB2 tensioner/brake assembly. Multiple disc brakes utilize reaction plates (30) between the friction disc assemblies. The release springs (34) assist in disengagement and retraction of the piston, pressure plate, and reaction plates, if applicable. High heat dissipation is accomplished by passing water through a special cavity behind the copper alloy wear plates.

Torque flows through the WCB2 tensioner/brake Assembly from the shaft to be controlled, through the friction disc assemblies, through the pressure plate and reaction plates, through the clamp tubes and studs, to the mounting flange, which is attached to a rigid surface.

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), wear spacers (29), or the release springs (34), as this may hinder the engagement or disengagement of the WCB2 tensioner/brake assembly.

Note: Some three and four disc units may require support on the cylinder end of the WCB2 tensioner/brake assembly in certain high torque applications. Contact the factory for specific application information.

2.1 Preparation and Arrangements

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 WCB2 tensioner/brake assembly.

2.1.2 The WCB2 tensioner/brake assembly's reaction member (such as the machine frame) should have a machined register to allow for mounting and alignment control of the WCB2 tensioner/brake assembly. The mounting surface should be designed to provide full support of the face of the mounting flange (1), preventing deflection during operation.

2.1.3 For proper operation and service life, the WCB2 tensioner/brake assembly's reaction member must be aligned to the shaft within the limits shown in Table 2.

⚠ **Caution**
Proper alignment is necessary to ensure that the the friction disc assemblies 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.

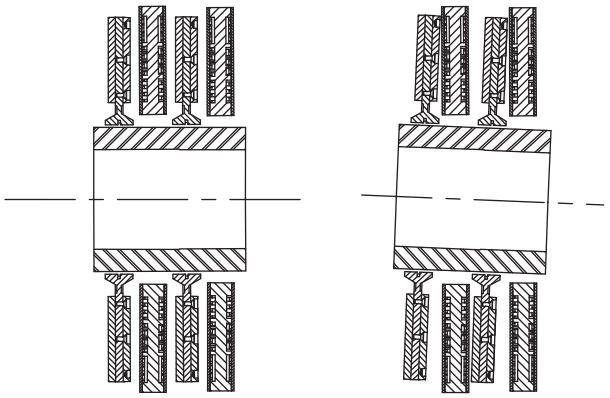


Figure 2

Table 2
Alignment Requirements

Size	Concentricity (Parallel, TIR) of Shaft and Tensioner Inches (mm)	Perpendicularity (Angular, TIR) of Mounting Flange to Shaft* Inches (mm)
24WCB2	0.010 (0,25)	0.012 (0,30)
36WCB2	0.010 (0,25)	0.019 (0,48)
48WCB2	0.010 (0,25)	0.025 (0,64)

*Perpendicularity measured near the outside diameter of the mounting flange.

Table 3
"A" dimension on Figure 1 - inches (mm)

Size	1xxWCB2	2xxWCB2	3xxWCB2	4xxWCB2
24WCB2	1.38 (35,1)	1.38 (35,1)	1.38 (35,1)	1.38 (35,1)
36WCB2	2.36 (59,9)	2.36 (59,9)	2.36 (59,9)	2.36 (59,9)
48WCB2	1.96 (50,0)	1.75 (44,0)	1.75 (44,0)	1.75 (44,0)

2.1.4 Refer to Table 3 for the setup dimension between the WCB2 tensioner/brake assembly's mounting surface and the end of the gear (dimension "A" on Figure 1). Gears should be positioned to ensure that when the WCB2 tensioner/brake assembly is mounted the friction disc assembly 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 WCB2 must be mounted to a clean, rigid surface 2with hardened flat washers and screws of the grade, quantity, and size as listed in Table 4. 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 the friction disc assemblies will track properly on the copper wear plates.

Note: To facilitate the mounting process, the friction disc Assemblies should be aligned to the gear and centered in the WCB2 tensioner/brake assembly. With the WCB2 tensioner/ brake assembly positioned with the mounting flange facing down, lower the gear (28) slowly and carefully into the splined bore of the friction disc assemblies (7). Adjust the discs so that they are centered in the WCB2 tensioner/brake assembly and fit in the gear. Apply and maintain an air pressure of 25 psig (1.7 bar) to the cylinder. This will engage and hold the friction disc assemblies in position during installation. Remove the gear.

⚠ **Danger**
Use only the proper number and grade fasteners shown in Table 4. 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 WCB2 tensioner/brake assembly to overheat.

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.

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 WCB2 tensioner/brake assembly's mounting surface ("A") is maintained. See Figure 1 and Table 3. Allow the gear to cool.

2.2.5 Apply a thin coat of MOLUB-ALLOY® 936 SF 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 friction disc assembly spline wear.

2.2.6 Pre-fill the grease channel in the friction disc assembly splines (if applicable) with MOLUB-ALLOY® 936 SF Heavy or equivalent grease, as shown on Figure 3.

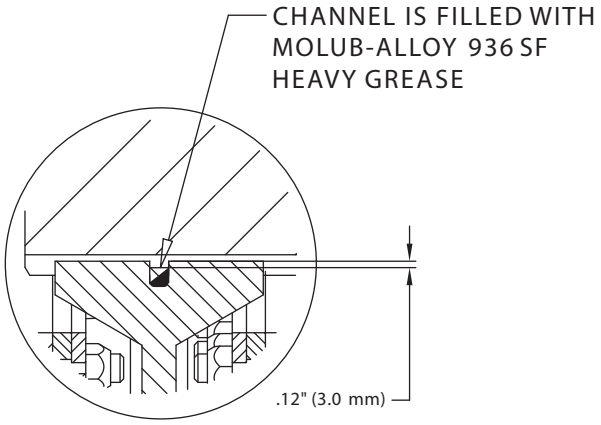


Figure 3

2.2.7 Rig the WCB2 into position and slide it over the gear. Avoid placing lifting straps or cables directly on the release springs (34).

Table 4
Fastener Description and Assembly Torque - ft.-lb. (Nm)

Item	Description	Specification	24WCB2	36WCB2	48 WCB2
4	Wear Plate Screw	Size	5/16-18 NC Gr. 8	3/8-16-NC2 Gr. 8	3/8-16-NC2 Gr. 8
5	Locknut	Quantity	90	108	120
		Torque, Dry	21 (28)	40 (54)	40 (54)
18	Locknut	Size	1 1/8-7 NC Gr. 8	1 3/8-6 NC Gr. 8	1 3/8-6 NC Gr. 8
		Quantity	12	16	16
		Torque, Lubed	500 (677)	750 (1016)	750 (1016)
Customer Supplied	Mounting Screw	Size	5/8-11NC-2 Gr. 8	1-8 NC Gr. 8	1 3/8-6NC Gr. 5
		Quantity	10	14	14
		Torque, Lubed	150 (203)	660 (895)	1100 (1490)
Customer Supplied	SAE Coolant Fittings	Size	SAE-12	SAE-20	SAE-20
		Quantity*	4	4	4
		Torque, O-Ring Lube	68-78 (92-105)	146-171 (198-231)	146-171 (198-231)

*Note: Increase the quanity of SAE coolant fittings by 4 for each Reaction Plate S/A (30) in the WCB2 tensioner/brake assembly.

2.2.8 Attach the mounting flange (1) to the mounting surface using the appropriate fasteners. If applied pressure was used to help position the discs during mounting, exhaust the air pressure prior to tightening the fasteners. Tighten the fasteners to the specified torque value. See Table 4.

⚠ **Caution**
Maximum allowable air pressure in the cylinder (19) is 150 psig (10.2 bar).

2.2.9 WCB2 tensioner/brake assemblies 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**
Maximum allowable air pressure is 150 psig (10.2 bar). Application of pressure exceeding maximum allowable may result in damage to the WCB2 tensioner/brake assembly.

2.3.1 Maximum allowable pressure is 150 psig (10.2 bar).

2.3.2 Use only clean, filtered air (a 50 micron filter or better is recommended) which is free of excess moisture.

2.3.3 Air inlet sizes are shown in Table 5. Air inlets are located on the face of the cylinder (19). For cylinders with three ports, the lowest port should be located at or near the 6 o'clock position to facilitate purging of moisture that may accumulate in the air system or cylinder.

Note: Positioning the drain plug (105) at a nominal 6 o'clock position will help insure the coolant inlets and outlets are at a nominal 12 o'clock and 6 o'clock position.

Table 5
Air Inlet Size

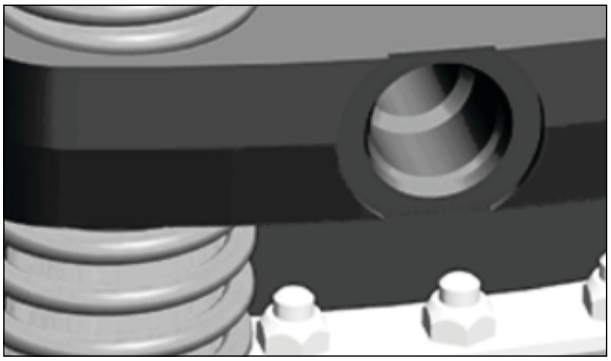
Size	Thread Size
24WCB2	1/2"-14 NPT
36WCB2	3/4"-14 NPT
48WCB2	1"-11.5 NPT

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.

2.3.5 The WCB2 tensioner/brake assembly does not require lubricated air; however associated control valves may. Consult the valve manufacturer for appropriate recommendations.

2.4 Coolant System

2.4.1 An ORB port can be identified by the machined spot face and a chamfer (for sealing of the O-ring). See Figure 4. See Table 4 for the torque values and the SAE fitting size associated with each WCB2 tensioner/brake assembly.



ORB PORT

Figure 4

⚠ **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 WCB2 tensioner/brake assembly.

⚠ **Caution**
Installation of NPT or other incompatible threaded piping or fittings into ORB ports will damage the ports, resulting in leakage or other failure.

2.4.2 Installation of straight SAE fittings.

2.4.2.1 Inspect the SAE fittings for damage and contamination.

2.4.2.2 Apply Molykote® 55 O- ring lubricant to the O- ring on the SAE fitting.

2.4.2.3 Turn the SAE fitting into ORB port until finger tight, then apply the respective assembly torque. Refer to Table 4.

2.4.3 Installation of adjustable SAE fittings.

2.4.3.1 Inspect the SAE fittings for damage and contamination.

2.4.3.2 Apply Molykote® 55 O- ring lubricant to the O- ring on the SAE fitting.

2.4.3.3 Ensure the O-ring and back up washer on the SAE fitting are in the proper position on non-threaded section of the SAE fitting nearest to locknut.

2.4.3.4 Tighten the SAE fitting by hand into the threads of the ORB port until the back-up washer contacts the face of the ORB port.

2.4.3.5 To position the SAE fitting, unscrew the SAE fitting up to one full turn then hold the SAE fitting in desired position and tighten locknut so that the back-up washer contacts face of ORB port and forces the O-ring on the SAE fitting within the boss cavity. Tighten to the torque listed in Table 4.

⚠ **Caution**
When installing SAE fittings male NPT fittings are very similar in size to SAE threads and will engage in the female SAE threaded ports. If this is done the WCB2 tensioner/brake assembly may be damaged! Only use SAE fittings in the coolant ports of the WCB2 tensioner/brake assembies.

2.4.4 Maximum allowable coolant pressure within the water cavity is water cavity is 40 psig (2.7 bar) for 36WCB2 and 48WCB2 tensioner/brake assemblies and water cavity is 45 psig (3.1 bar) 24WCB2 tensioner/brake assemblies. See Table 6 for coolant pressure limitations as measured at the inlets and outlets of water jackets. Note that inlet pressures exceeding the maximum allowable static pressures are only permissible under dynamic flow conditions, provided that the average pressure between the inlet and outlet does not exceed the maximum allowable pressure stated above. 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.

⚠ **Caution**
High outlet pressures or surges exceeding maximum allowable may result in damage to the WCB2 tensioner/brake assembly.

⚠ **Caution**
Maximum allowable water pressure is dependent upon WCB2 tensioner/brake assembly size and specific application requirements.

⚠ **Caution**
Inlet pressures exceeding the maximum allowable average pressure are only permissible when the outlet pressures are at or below the limits listed in Table 6.

Table 6
Coolant Pressure - psi (bar)

Size	Maximum Static Pressure	Maximum Inlet Pressure*	Maximum Average Pressure$_1$*
24WCB2	45 (3,1)	65 (4,5)	45 (3,1)
36WCB2	40 (2,7)	60 (4,1)	40 (2,7)
48WCB2	40 (2,7)	60 (4,1)	40 (2,7)

1 MaximumAverage Pressure = (Inlet + Outlet)/2
*Under Dynamic Flow Conditions
Note: Minimum outlet pressure under dynamic flow conditions equals zero.
Note: Above ratings for tensioning / winding type applications. For high cyclic applications, consult the factory.

2.4.5 The coolant supply and discharge hose, pipe and fitting sizes, along with minimum flow rates for the WCB2 tensioner/brake assembly's rated horsepower, are listed in Table 7.

2.4.6 Coolant supply connections to the WCB2 tensioner/brake assembly should provide a parallel flow through each section of the tensioner. Series flow is not recommended, as it can lead to overheating of the WCB2 tensioner/brake assembly.

2.4.7 Inlet and outlet coolant manifolds must be provided. Manifolds should be constructed to allow for even flow through all ports. Two hoses can be routed to the reaction plates (30) to assist with balancing the flow to each wear plate.

2.4.8 Use flexible connecting hose to each WCB2 tensioner/brake assembly's coolant section to allow axial travel of the pressure plate, reaction plate, and end plate during the WCB2 tensioner/brake assembly's operation without restricting the movement of components. When determining hose lengths, consideration should be given to movement and location of the pressure plate and reaction plate as friction material wears. Hose lengths running between the manifolds 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.

Table 7
Coolant Supply Data

Model	Thermal Rating HP (kW)[1]	Water Inlet and Outlet Pipe Size (Minimum piping I.D.)	Min. Flow Rate GPM (dm^3/min) 100% Water[2]	Min. Flow Rate GPM (dm^3/min) 70% Water, 30% Ethylene Glycol by vol.[3]	Min. Flow Rate GPM (dm^3/min) 60% Water, 40% Ethylene Glycol by vol.[4]	Min. Flow Rate GPM (dm^3/min) 50% Water, 50% Ethylene Glycol by vol.[5]
124	270 (201)	SAE-12	27 (102)	32 (121)	35 (132)	40 (151)
224	540 (402)	(3/4")	54 (204)	64 (242)	70 (265)	80 (303)
324	810 (603)		81 (305)	96 (361)	105 (395)	120 (451)
424	1080 (805)		108 (406)	128 (481)	140 (526)	160 (602)
136	650 (485)	SAE-20	65 (246)	76 (288)	84 (318)	98 (371)
236	1300 (969)	(1")	130 (489)	152 (572)	168 (632)	196 (737)
336	1950 (1454)		195 (738)	228 (863)	253 (958)	294 (1113)
436	2600 (1937)		260 (978)	304 (1143)	336 (1263)	392 (1474)
148	1300 (969)	SAE-20	130 (489)	152 (572)	168 (632)	196 (737)
248	2600 (1937)	(1-1/4")	260 (978)	304 (1143)	336 (1263)	392 (1474)
348	3900 (2906)		390 (1467)	456 (1715)	504 (1895)	588 (2211)
448	5200 (3874)		520 (1956)	608 (2286)	672 (2526)	784 (2948)

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. 10HP/GPM, (1.97kw/(dm^3/min))
3. 8.55HP/GPM, (1.68kw/(dm^3/min))
4. 7.74HP/GPM, (1.53kw/(dm^3/min))
5. 6.63HP/GPM, (1.31kw/(dm^3/min))

Note: Minimum Flow Rates listed above are to achieve thermal rating. Lower flow rates are acceptable provided that they satisfy peak thermal requirement

2.4.9 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.

2.4.10 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.

2.4.11 Figure 5 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.

2.4.12 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 8. However, in no event should there be more than a 50°F (28°C) temperature rise between inlet and outlet. See Table 8 for maximum allowable outlet coolant temperature with various water/ethylene glycol mixtures and other cooling media.

Table 8
Maximum Inlet & Outlet Coolant Temperature

Water/ Ethylene Glycol Mixture	Maximum Allowable Coolant Inlet Temperature °F (°C)*	Maximum Allowable Coolant Outlet Temperature °F (°C)	Maximum Allowable Coolant Temperature Rise°F (°C)
100/0	100 (38)	150 (66)	50 (28)
70/30	115 (46)	165 (74)	50 (28)
60/40	115 (46)	165 (74)	50 (28)
50/50	120 (49)	170 (77)	50 (28)

* Provided that temperature rise is no greater than 50°F (28°C)

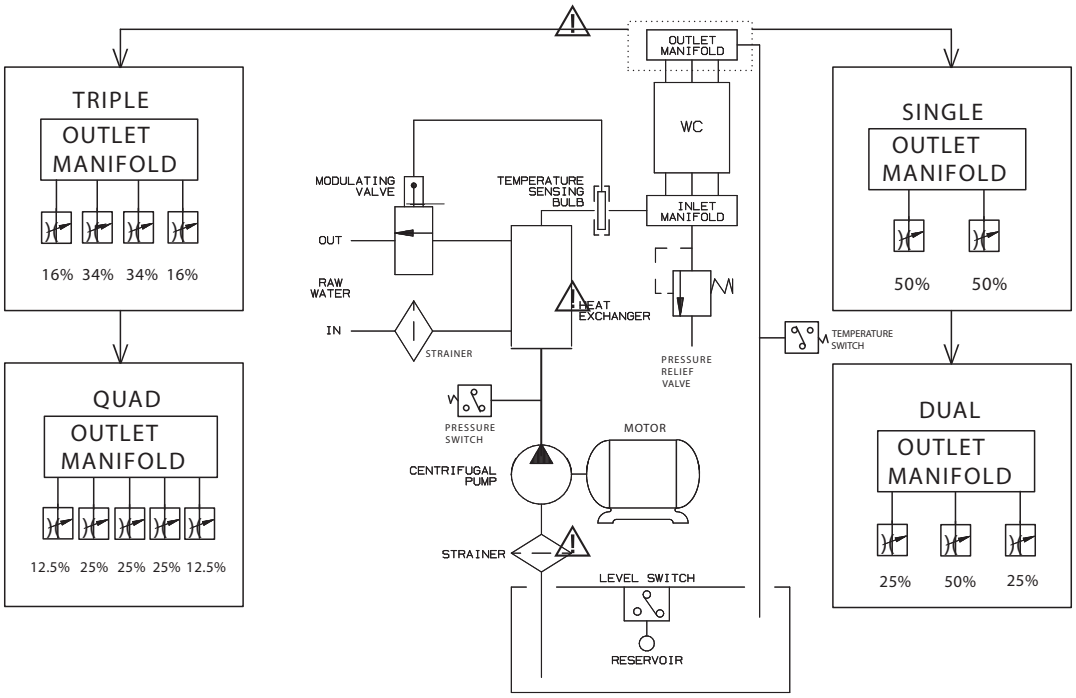


Figure 5

2.4.13 Open Loop Systems

For efficient operation of the WCB2 tensioner/brake assembly, an adequate supply of filtered fresh water is required. (See 2.4.4 - 2.4.5). Excessive water hardness promotes the formation of scale deposits, which, in time, will affect the service life of the WCB2 tensioner/brakeassembly.

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 thoroughlyflushed with clean fresh water after operation to reduce the corrosive effects of contaminants on internal components.

2.4.14 Closed Loop Systems

For efficient operation of the WCB2 tensioner/brake assembly 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 WCB2 tensioner/brake assembly's functioning:

⚠ **Warning**
Friction material must be worn-in to achieve product torque rating. For new installations or after repair, a minimum wear-in period for the friction couple of four hours at 50% of the rated horse-power is recommended to achieve rated torque. Verify proper operation before putting the product into service.

⚠ **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 9. Exposure to speeds in excess of these values may cause the friction discs (8) to burst and result in extensive damage to the the WCB2 tensioner/brake assembly and/or cause personal injury.

⚠ **Caution**
For proper cooling of the WCB2 tensioner/brake assembly, 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 8.

⚠ **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).

Table 9
Maximum Friction Disc Assembly Speeds

Size	Max. Slip Speed RPM	Max. Free Wheeling Speed RPM
24WCB2	715	1200
36WCB2	475	700
48WCB2	360	600

3.2 Pressure and Speed Limits

3.2.1 Maximum applied air pressure is 150 psig (10.2 bar).

3.2.2 Maximum coolant pressure allowable within the water cavities is 40 psig (2,7 bar) for for the 36WCB2 and 48WCB2 tensioner/brake assemblies and 45 psig (3,1 bar) for the 24WCB2 tensioner/brake assemblies. 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 the WCB2 tensioner/brake assemblies model type. Water piping elevations, restrictions in outlet piping or pressure surges may cause pressures that exceed the maximum allowable, resulting in damage to the WCB2 tensioner/brake assembly.

3.2.3 Maximum slip speeds and free-wheeling friction disc assembly speeds are shown in Table 9.

⚠ **Caution**
Excessive slip speeds will result in rapid friction material wear. For good life of wear components, the operating values in Table 9 should not be exceeded.

3.3 Periodic Maintenance

3.3.1 As the friction material wears, adjustment of the WCB2 tensioner/brake assembly may be required to keep pistons within the proper stroke range. See Section 4.1 - 4.2 and Table 13 for wear measurements, adjustment procedures and component wear indication.

3.3.2 Periodically check for external air leakage in the area of the piston seals (21) (23). For replacement, refer to procedures in Section 4.6.

3.3.3 Moisture that may accumulate in the cylinder can be purged. 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 psig (0.69 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.

3.3.4 Periodically observe the rotating friction disc assemblies while the WCB2 tensioner/brake assembly is fully released. Dragging discs may be caused by wear or contamination of the gear or friction disc assemblies splines, lack of spline lubrication, friction disc assemblies imbalance, warped friction disc assemblies, or misalignment. Correct as required.

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

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

3.3.6.1 Static Pressure Test:

(a) Release the WCB2 tensioner/brake assembly by exhausting the air pressure from the WCB2 tensioner/brake assembly and secure the air supply during this test.

⚠ **Warning**
Ensure that the machinery will remain in a safe position prior to releasing the WCB2 tensioner/brake assembly.

(b) Bleed all air from within the coolant cavity. Air bleeding must be accomplished by running coolant through the cavity with the WCB2 tensioner/brake assembly 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 40 psig (2.7 bar) for the 36WCB2 and 48WCB2 tensioner/brake assemblies, and 45 psig (3.0 bar) for the 24WCB2 tensioner/brake assemblies. Maintain this pressure for 30 minutes. Check for leakage at O.D. and I.D. sealing areas.

⚠ **Caution**
Be sure that air pressure is exhausted from 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.

3.3.6.2 Dynamic Flow Test:

(a) Dynamic flow testing of the WCB2 tensioner/brake assembly should be conducted at the required flow rate for the rated HP dissipation and coolant quality, as given in Table 7. Inlet and outlet pressures for the appropriate WCB2 tensioner/brake assembly model as listed in Table 6 should not to be exceeded.

(b) There should be no restrictions on the outlet side of the WCB2 tensioner/brake assembly to cause any back pressure to the unit. Coolant inlet and outlet sizes are listed in Table 7. 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 WCB2 tensioner/brake assembly, 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 WCB2 tensioner/brake assembly. 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.

4.1 Wear Limits

⚠ **Warning**
Periodically examine the WCB2 tensioner/brake assembly for wear of friction material and wear plates. Failure to perform this examination periodically may result in excessive wear to components, improper operation or a significant reduction in torque, and may result in personal injury and/or damage to the machinery.

4.1.1 Wear limits for the WCB2 tensioner/brake assembly's components are shown in Table 13. If any wear limit has been reached or exceeded, that component must be repaired or replaced.

4.2 Wear Adjustment

⚠ **Warning**
If a wear adjustment is not made when required, the brake torque may deteriorate to the point where the equipment will not stop properly.

4.2.1 Determining Wear

The friction material must be replaced when worn to the bottom of the groove of the friction material as shown on Figure 6 (or O.D. "step" for 48WCB2 tensioner/brake assembly) or any "Y" or "Z" dimension exceeds the limits shown on Table 10. On multi-disc units, a wear adjustment is required when the "X" dimension has been reached and the friction discs or "Y" or "Z" dimension(s) are NOT worn to their limits.

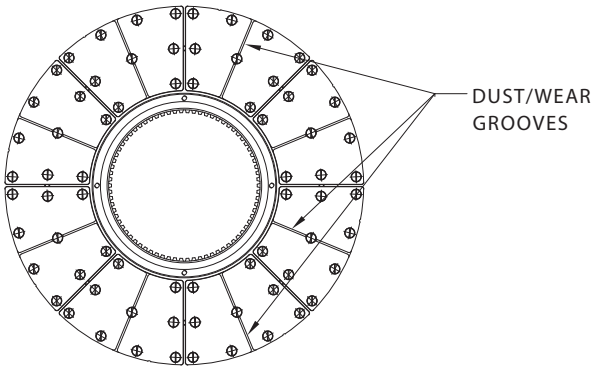


Figure 6

4.2.1.1 Single Disc Units

Apply approximately 25 psig (1.7 bar) air pressure to the cylinder to engage the WCB2 tensioner/brake assembly. Measure the "X" gap between the cylinder (19) and the pressure plate (13) or the gap "Y" between the pressure plate (13) and the mounting flange (2) as shown in Figure 7. If either gap exceeds the limits shown in Table 10, the friction discs and/or wear plates must be inspected to ensure that the wear limits listed in Table 13 have not been exceeded.

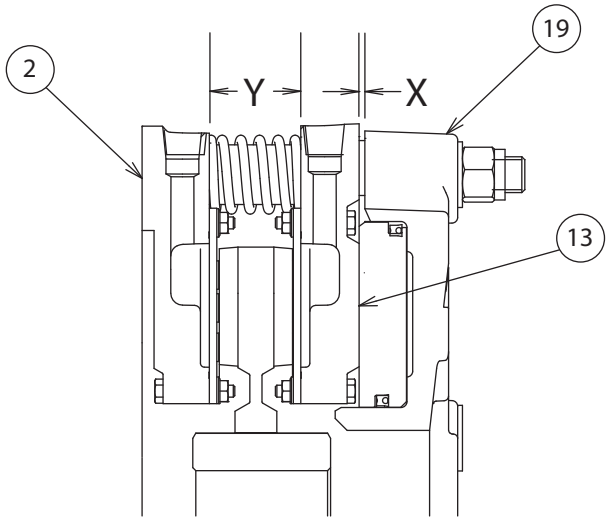


Figure 7

4.2.1.2 Multi - Disc Units

Apply approximately 25 psig (1.7 bar) air pressure to the cylinder to engage the tensioner. Measure the gap "X" between the cylinder (19) and the pressure plate (13) to determine if adjustment may be required.

Measure the "Y" gap between the pressure plate (13) and the reaction plate (31), the "Y" gap between the reaction plate (31) and the mounting flange (2), and the "Z" gap between the reaction plates (31) as shown in Figures 8, 9, 10.

If the "X worn" dimension has been reached or exceeded and the "Y" or "Z" dimensions have not reached the limits shown in Table 10 and none of the friction discs are worn to the bottom of the wear groove / step, wear adjustment is required. It is also recommended that wear plates be inspected to ensure that the wear limits listed in Table 13 have not been exceeded.

⚠ **Warning**
If wear adjustment is not made, the piston may extend out of the cylinder beyond an acceptable operating range, resulting in loss of torque and/or seal damage.

If the "Y" or "Z" dimensions have been reached or any of the friction discs are worn to the bottom of the wear groove (or step), the WCB2 tensioner/brake assembly should be taken out of service and rebuilt with new components as required.

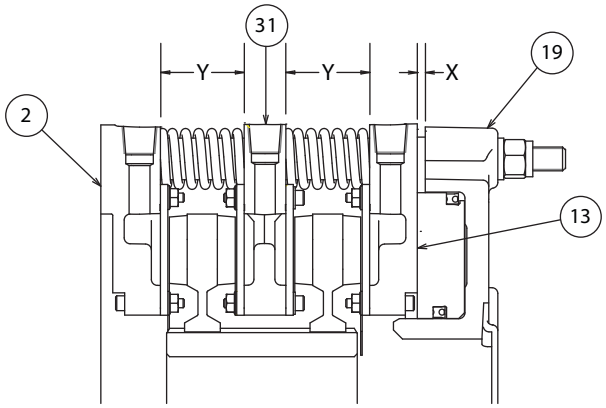


Figure 8

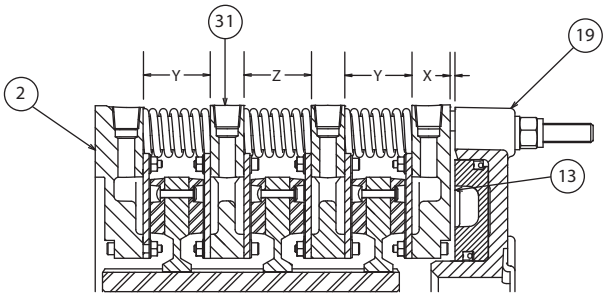


Figure 9

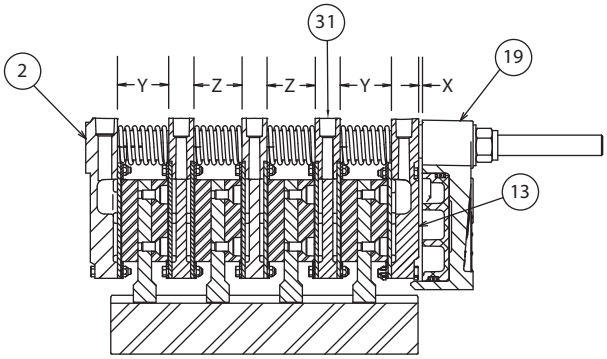


Figure 10

4.2.2 Adjustment Procedure

Wear adjustment can be conducted without full disassembly of the WCB2 tensioner/brakeassembly. The wear adjustment spacers are slotted to allow for easy removal with a chisel.

⚠ **Warning**
Before performing any maintenance work on the WCB2 tensioner/brakeassembly, make sure that the machinery will remain in a safe position. Failure to do so could result is serious injury or possibly death.

Note: It may be necessary to disconnect air and water supply lines to prevent damage to the hoses and binding of components during the adjustment procedure.

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.

⚠ **Warning**
Removal of spacers in quantities other than complete sets (layers) will result in severe damage to WCB2 tensioner/brake assembly components during reassembly, and could cause the WCB2 tensioner/brake assembly to not function properly.

Table 10
Wear Measurements X, Y, & Z Gaps - Inches (mm)

Model	X - New*	X - Max (Adjustment)	Y - New	Y - Min	Z - New	Z - Min
124	0.09 (2,3)	0.59 (15,0)	2.92 (74,2)	2.42 (61,5)	_	_
224	0.18 (4,6)	0.68 (17,3)	2.92 (74,2)	2.25 (57,2)	_	_
324	0.27 (6,9)	0.77 (19,6)	2.92 (74,2)	2.25 (57,2)	2.58 (65,5)	2.08 (52,8)
424	0.36 (9,1)	0.86 (21,8)	2.92 (74,2)	2.25 (57,2)	2.58 (65,5)	2.08 (52,8)
136	0.12 (3,0)	0.54 (13,7)	2.75 (69,9)	2.31 (58,7)	_	_
236	0.24 (6,1)	0.66 (16,8)	2.75 (69,9)	2.31 (58,7)	_	_
336	0.36 (9,1)	0.78 (19,8)	2.75 (69,9)	2.31 (58,7)	2.75 (69,9)	2.31 (58,7)
436	0.48 (12,2)	0.90 (22,9)	2.75 (69,9)	2.31 (58,7)	2.75 (69,9)	2.31 (58,7)
148	0.15 (3,8)	0.57 (14,5)	3.37 (85,6)	2.95 (74,9)	_	_
248	0.30 (7,6)	0.72 (18,3)	3.37 (85,6)	2.95 (74,9)	_	_
348	0.45 (11,4)	0.87 (22,1)	3.37 (85,6)	2.95 (74,9)	3.37 (85,6)	2.95 (74,9)
448	0.60 (15,2)	1.02 (25,9)	3.37 (85,6)	2.95 (74,9)	3.37 (85,6)	2.95 (74,9)

*Value shown is gap after wear adjustment.
New or rebuilt brakes may vary slightly from this value due to tolerances.

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) evenly (ONE TURN AT A TIME) and in an alternating (cross wise) pattern to prevent binding of the cylinder on the studs. Continue to loosen the locknuts until the force of the release springs is relieved, allowing for access to the wear spacers. It may be necessary to push the pressure plate and reaction plate(s) away from the mounting flange so that the release springs can be moved to gain access to the wear spacers.

4.2.2.4 Wear spacers are slotted to allow for in-place removal. Using a narrow chisel wedged into the slot in the spacer, as shown in Figure 11, 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 (one spacer from each stud location).

⚠ **Warning**
Be sure to collect all wear spacers when removed. Spacers lodging in between WCB2 tensioner/brake assemblies components could prevent the WCB2 tensioner/brake assembly from properly engaging or releasing.

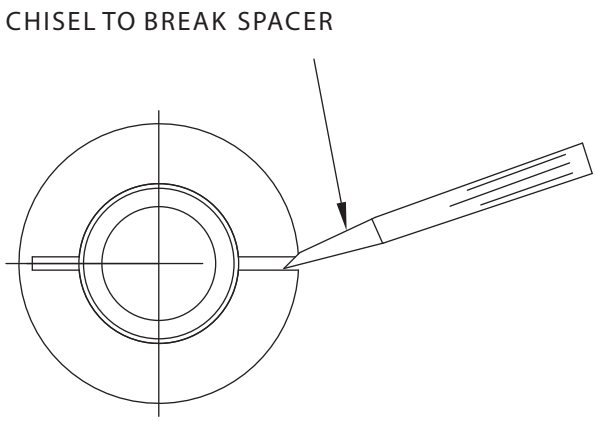


Figure 11

4.2.2.5 While supporting the weight of the cylinder/piston assembly, tighten the locknuts (18) ONE TURN AT A TIME and in a crosswise pattern, until the cylinder is seated firmly against the clamp tubes. Torque the locknuts to the appropriate value. See Table 4.

⚠ **Caution**
The locknuts (18) must be tightened gradually and evenly to prevent damage to the WCB2 tensioner/brake assemblies components.

4.2.2.6 Reinstall the support bracket if required.

4.2.2.7 Restore any pipingor covers removed prior to operating the WCB2 tensioner/brake assembly.

4.3 Disassembly Procedures

⚠ **Warning**
Ensure that the machinery is and will remain in a safe position prior to loosening fasteners or removing the WCB2 tensioner/brake assembly.

4.3.1 Disconnect the air supply lines and water lines from the WCB2 tensioner/brake assembly.

4.3.2 Remove the fasteners that secure the WCB2 tensioner/brake assembly (and support bracket, if applicable) to the mounting structure.

4.3.3 Using soft slings, rig the WCB2 tensioner/brake assembly and slide the WCB2 tensioner/brake assembly off of the gear. Avoid placing slings or straps directly on the release springs (34).

4.3.4 Transport the WCB2 tensioner/brake assembly to a clean working area and position the unit on a flat surface with the mounting flange (1) 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 (1), reaction plates (30), pressure plate (13) and cylinder (19) to one another prior to disassembly to adequately show the proper orientation of components and various ports to one another.

4.3.7 Loosen the locknuts (18) ONE TURN AT A TIME and in sequence until the release spring force is relieved.

4.3.8 Lift the cylinder and piston off of the studs as an assembly. Set the assembly aside on a clean, level area, making sure to avoid damaging the face of the piston.

4.3.9 Continue removing the remaining components if required.

4.3.10 Inspect all components using the wear limits in Table 13 as a reference.

4.3.11 For friction disc replacement refer to Section 4.4

4.3.12 For wear plate replacement refer to Section 4.5.

4.3.13 For seal replacement refer to Section 4.6.

4.3.14 Assemble the WCB2 tensioner/brake assembly per Section 4.8.

4.4 Friction Material Replacement

Note: When replacing friction material, it is recommended that the mating wear surface be replaced or machined flat to ensure good contact between the mating surfaces. See Table 13 for wear limits.

4.4.1 Friction disc cores may be relined with new friction material per the following instructions. Refer to Section 7.1 or 7.2 for the appropriate friction disc (or block) replacement part numbers.

⚠ **Caution**
Use only genuine Airflex friction material. Use of friction material not of Airflex origin may result in unpredictable performance.

4.4.2 Disassemble the WCB2 tensioner/brake assembly 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 all burrs, corrosion etc. from the friction disc core or mounting surface.

4.4.5 Position the friction material to align the screw holes. Install several screws loosely at several of the outer most screw hole locations to properly align the friction discs or blocks. For friction discs on the 24WCB2 tensioner/brake assembly install the remaining screws in an even, crosswise pattern per the procedure in the next paragraph. When installing screws in friction blocks on the 36WCB2 and 48WCB2 tensioner/brake assemblies, install and tighten the screws from the centermost position in the block, then progress towards the outer edges of the block.

Following the above pattern, install one screw at a time by applying Loctite® #262 to the screw threads and tightening the screw to the proper torque value. Tighten screws to 15 ft.-lb. (20.3 Nm). Install and torque each remaining screw immediately after application of Loctite®, then proceed to the next screw. Be sure to remove, apply Loctite® and properly tighten the initial screws used for alignment of the friction disc or block.

Note: Note the relevant safety precautions in the following column when assembling screws.

⚠ **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 WCB2 tensioner/brake friction disc assemblies (7) for the 36WCB2 and 48WCB2 tensioner/brake assemblies require that the friction material be machined flat after assembly to allow for even contact and minimize wear-in. Attach the friction blocks (8) to one side of the disc core (9) and machine to 0.748" (19 mm) +/- 0.010" (0,25 mm). Install the friction blocks to the opposite side of the disc core and machine those friction blocks to make a thickness of 2.25" (57,15 mm) for the entire friction disc assembly. The flatness specification is 0.010" (0,25 mm) and the parallelism specification is 0.010" (0,25 mm) for the entire friction disc assembly. The perpendicularity specification is 0.010" (0,25 mm) from the disc blocks to the spline of the disc core.

⚠ **Warning**
Use appropriate safety equipment and dust collection systems when machining friction material.

4.4.7 After replacement of friction material, re-assemble the WCB2 tensioner/brake per Section 4.8. During startup, observe wear-in and operation precautions per Section 3.0, Operation.

⚠ **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.

4.5 Wear Plate Replacement

Note: As of July, 2014 wear plate replacement kits for 24WCB2 and 36WCB2 tensioner/brake assemblies are supplied with sealant tape. This is now the preferred method of sealing the water cavity. Wear plate replacement kits for sizes 24WCB2 and 36WCB2 tensioner/brake assemblies prior to July, 2014 used Loctite Superflex® #596 Sealant. Should the wear plate replacement kit being used contain Loctite Superflex® #596 Sealant, refer to Section 4.5.6 for assembly procedures.

Note : When replacing wear surfaces, it is recommended that the mating friction material be replaced or machined flat to ensure good contact between the mating surfaces. See Table 13 for wear limits.

4.5.1 Disassemble the WCB2 tensioner/brake assembly 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 re-painting is necessary, sand blast the water passages and paint the surfaces with PLASITE® Epoxy #9052 Polymine coating. Dry film thickness should be 8 to 12 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**
Follow manufacturer's instructions and proper safety precautions for application of epoxy coatings.

⚠ **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.

4.5.4 For wear plate replacement kits that contain Loctite Superflex® #596 Sealant proceed to section 4.5.6 for assembly instructions.

4.5.5 Assembly with Gasket Tape.

Note: The Mounting Flange (1), Pressure Plate (14), and Reaction Plate(s) (31) will be referred to as IRON in the following paragraphs. Refer to Figure 22 for item number references shown in parenthesis (#).

4.5.5.1 Preparation and cleaning the IRON:

Ensure that the IRON surface is smooth and free of paint 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.

⚠ **Caution**
Use only clean, dry air for blow-off.

⚠ **Caution**
Follow manufacturer's instructions and proper safety precautions for the use of solvent based cleaners (acetone, mineral spirits or general purpose) for oil/grease remover.

4.5.5.2 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**
Use only clean, dry air for blow-off.

⚠ **Caution**
Follow manufacturer's instructions and proper safety precautions for the use of solvent based cleaners (acetone, mineral spirits or general-purpose) for oil/grease remover.

4.5.5.3 Preparation of the Gasket Tape Ends

Cut the leading and trailing ends of the gasket tape at 45 degrees per Figure 12. This initial step is required to insure a smooth transition of the leading and trailing ends of the tape when it is overlapped per Section 4.5.5.4 (b).

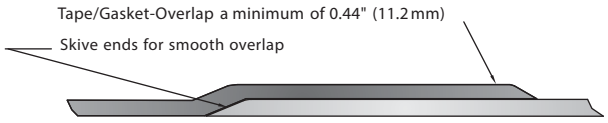
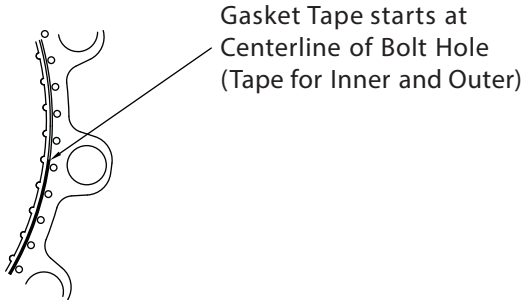


Figure 12

4.5.5.4 Applying the Gasket Tape to the IRON.

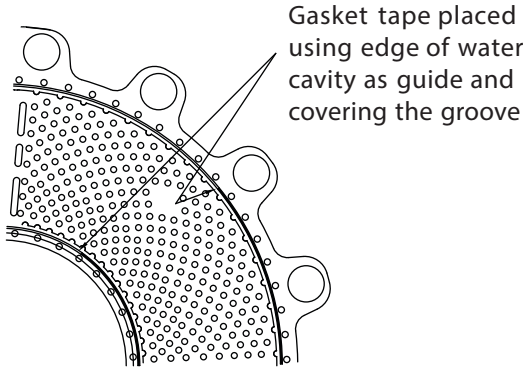
(a) Start with the sealing area nearest to the inner diameter on the IRON. Remove the adhesive backing on the gasket tape a little at a time to prevent the adhesive from picking up dirt during installation. Start by positioning one end of the tape at the center-line of a bolt hole as shown in Figure 13, using the edge of the water cavity as a guide, as shown in Figure 14. Proceed to apply the tape on the sealing surface following a smooth circular path, being sure to press the tape in place.

Note: The tape will cover the machined groove that is located between the water cavity and the bolt holes.



Start location of gasket tape

Figure 13



Placement of Gasket Tape

Figure 14

(b) After the gasket tape has been placed around the entire circumference, overlap the starting end of the end of the tape by a minimum of 0.44" (11.2 mm). See Figure 12. Be sure to smooth the tape at the overlap transition in order to get a good seal. No air gaps or bubbles should be present.

(c) Repeat steps (a) and (b) in Section 4.5.5.4 for the outer sealing area nearest to the outer diameter of the IRON, again using the edge of the water cavity as a guide.

4.5.5.5 Proceed to Section 4.5.7 to complete the wear plate (3) replacement.

⚠ **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.

4.5.6 Assembly with Loctite Superflex® #596 Sealant

4.5.6.1 Clean and completely dry the sealing surfaces at the I.D. and O.D. on the pressure plate (14), reaction plate(s) (31) and mounting flange. These surfaces should be free of nicks and scratches to prevent leaks. Minor nicks and scratches may be filled with Loctite Superflex® #596 Sealant during assembly.

4.5.6.2 Apply a uniform bead of Loctite Superflex® #596 Sealant in the grooves of the pressure plate, reaction plate(s) and/or mounting flange. Recommended bead diameter is 0.060" - 0.090" (1,5 mm - 2,3 mm) for the 24WCB2 and 36WCB2 tensioner/brake assemblies except for the 48WCB2 tensioner/brake assemblies. For the 48WCB2 tensioner/brake assemblies, refer to procedure 4.5.6.3 for proper sealant application procedure. For the 24WCB2 and 36WCB2 tensioner/brake assemblies skip to Section 4.5.7 after application of sealant.

⚠ **Caution**
Loctite Superflex® #596 Silicon Sealant will begin to set up and skin over in approximately 10 minutes. The wear plate must be fastened to the mating component within 10 minutes of applying the sealant.

4.5.6.3 The 48WCB2 incorporates a dual groove for both the Loctite Superflex® #596 Sealant and an O-ring. An initial bead of sealant 0.030" - 0.060" (0,7 mm - 1,5 mm) in size must be applied to the bottom of the deep groove in order to hold the O-ring in place. See Figure 15.

4.5.6.4 Install the O-rings (I.D. and O.D.) on top of the sealant, working them into position so that they lay flat in the bottom of the groove. See Figure 16. A second bead of sealant 0.060" - 0.090" (1,5 mm - 2,3 mm) in size should then be applied in the shallow groove. See Figure 17.

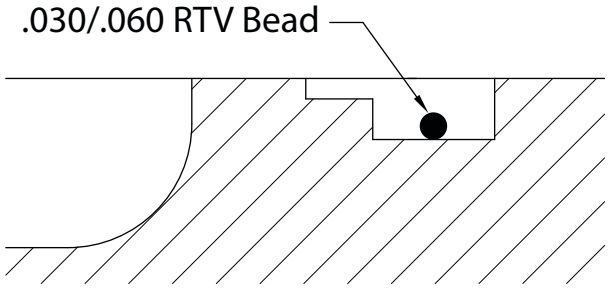


Figure 15

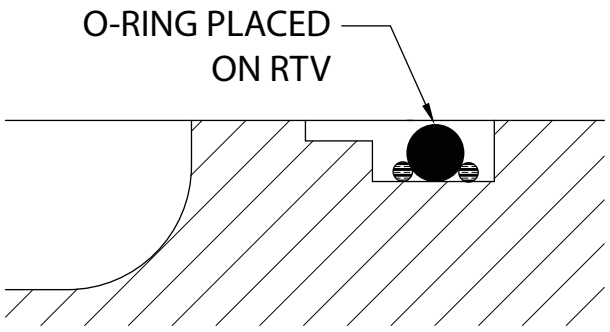


Figure 16

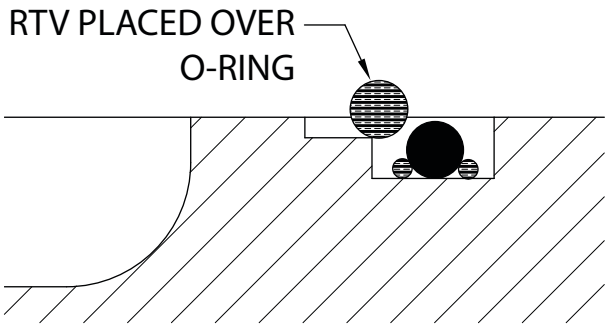


Figure 17

4.5.7 Inspect the new wear plates (3) 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.

4.5.8 Position the support rings (50) & (51) over the holes in the wear plates (3) and install the new hex head screws (4) and locknuts (5) provided, securing them finger tight.

⚠ **Caution**
To prevent excessive warping of the wear plate and to endure a good seal, the following torque tightening procedure must be followed.

4.5.9 For each wear plate being replaced, the torque tightening instructions are as follows:

Note: The torque of the screws & nuts (4) (5) that attach the wear plate (3) to the mounting flange (1), reaction plate (30) & pressure plate (13) is a four step process.

(a) For the first 16 screws, bring the initial torque of each screw up to 33% of the torque value shown in Table 11 using the tightening sequence shown in Figure 18. Install and torque the remaining screws in any reasonable crosswise pattern to 33% of the torque value shown in Table 11.

Table 11
Wear Plate Fastener Torque - ft.lb.(Nm)

Size	Size	Torque
24WCB2	5/16-18NC	21 (28)
36WCB2	3/8-16NC2	40 (54)
48WCB2	3/8-16NC2	40 (54)

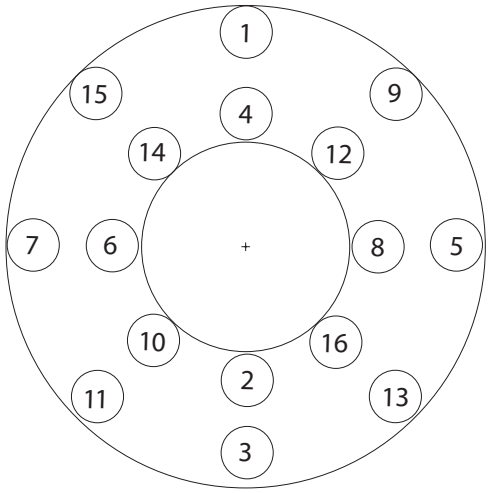


Figure 18

(b) Repeat the sequence of torque tightening on the first 16 screws as shown in Figure 18 and bring each screw up to 66% of the torque value shown in Table 11. Torque the remaining screws in any reasonable crosswise pattern to 66% of the torque value shown in Table 11.

(c) Repeat the sequence of torque tightening on the first 16 screws as shown in Figure 18 and bring each screw up to 100% of the torque value shown in Table 11. Torque the remaining screws in any reasonable crosswise pattern to 100% of the torque value shown in Table 11.

(d) Finish torque tightening by selecting a starting position (usually at the 12 o'clock position) and check the 100% torque of each screw going in a sequential clockwise or counterclockwise rotation. Mark or highlight screw head or nut & shank after final torque check as a visual indication that the screw/nut has been tightened to specification shown in Table 11.

⚠ **Caution**
Allow the Loctite Superflex® #596 Sealant 24 hours to completely cure before performing the following leak test procedure

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

4.5.11 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 12 for water port sizes.

Table 12
Inlet and Outlet Water Port Sizes

Size	Size
24WCB2	SAE-12
36WCB2	SAE-20
48WCB2	SAE-20

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

4.5.13 Install SAE threaded pipe plug(s) in the outlet port(s) and apply appropriate water pressure 40 psig (2.7 bar) for the 36WCB2 and 48WCB2 tensioner/brake assemblies and 45 psig (3.1 bar) for the 24WCB2 tensioner/brake assemblies measured at the inlet. Maintain this pressure for a minimum of 30 minutes.

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

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

4.5.16 Follow steps in Section 4.8 to reassemble the WCB2 tensioner/brakeassembly.

4.5.17 Machining of the wear surfaces is required for 36WCB2 and 48WCB2 tensioner/brakeassemblies after replacement of the wear plates or the adjoining friction material. See Figure 19 for machining specifications. Clean all wear surfaces after machining to remove any residual contaminates.

⚠ **Warning**
Failure to machine wear plates flat could result in poor contact between the friction couple and subsequent reduction or erratic torque of the WCB2 tensioner/ brake assembly.

⚠ **Caution**
After replacement or machining of wear plates, a minimum wear-in period of four hours at 50% of the rated horsepower is recommended for the friction couple to achieve rated torque.

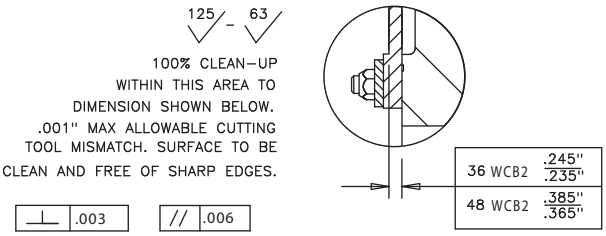


Figure 19

4.6 Cylinder Seal Replacement

Note: Item numbers (#) are shown on Figure 1.

4.6.1 Disconnect the air connections.

4.6.2 While supporting the cylinder, loosen the locknuts (18) ONE TURN AT A TIME and in an alternating (crosswise) pattern until the spring force is completely relieved. Remove the locknuts and washers (17). Deep well sockets are required for removal of the locknuts.

4.6.3 Using lifting equipment, carefully remove the cylinder (19) and piston (33) as an assembly. Set aside in a clean area.

4.6.4 Place the cylinder and piston assembly with the piston facing down on blocks approximately 6" (150 mm) high. The blocks must only contact the cylinder (19) so that the piston (33) will be free to move out of the cylinder bore.

4.6.5 If a regulated air line is available, the piston can be partially ejected from the cylinder by applying no more than 15 psig (1.0 bar) to the cylinder.

⚠ **Caution**
Application of a higher pressure may cause damage to the components.

4.6.6 To complete the removal of the piston from the cylinder, open all air inlets. Alternately insert a 0.50" (12 mm) diameter by 6" (150 mm) long wood dowel into each air inlet and gently tap the piston with a mallet so that it moves evenly out of the cylinder. Be careful not to damage the sealing surfaces of the piston or cylinder by cocking the piston in the cylinder.

4.6.7 Remove the old seals and discard.

4.6.8 Inspect the cylinder sealing surface condition for nicks or scratches or any other defect which may prevent the seals from being effective. See Table 13 for wear limits of the sealing surface. Replace the cylinder, if necessary.

4.6.9 Thoroughly clean the seal grooves in the piston (33) and apply a thin, even coat of Molykote® 55 O- ring lubricant to the piston seal grooves and chamfer on the piston, the sealing surfaces in the cylinder (19), and the seals (21)(23).

4.6.10 Install the new seals in the grooves in the piston, noting the orientation of the seal lips. See Figure 20.

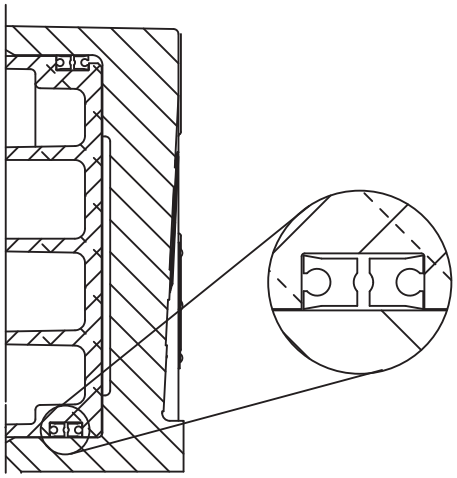


Figure 20

4.6.11 Position the cylinder on a flat, level surface so that the pressure cavity faces upward.

4.6.12 Carefully place the piston onto the cylinder with the chamfered edge of the piston facing downward, taking special care to avoid damaging the seal lips.

4.6.13 Gradually apply an evenly distributed force to press the piston into the cylinder being sure not to cock the piston which may damage the sealing surfaces. The use of 'C-clamps' may assist with the assembly process.

4.6.14 Using a lifting strap, slide the cylinder/piston assembly onto the studs.

4.6.15 Lubricate the threads on the end of the studs with 30 wt. oil or anti-seizing compound and install the washers (17) and locknuts (18).

4.6.16 While supporting the weight of the cylinder/piston assembly, tighten the locknuts, ONE TURN AT A TIME and in an alternating (crosswise) pattern until the cylinder is seated firmly against the clamp tubes. Torque the locknuts to the appropriate value. See Table 4.

⚠ **Caution**
The locknuts (18) must be tightened gradually to prevent damage to the WCB2 tensioner/brake assembly components.

4.6.17 Connect an air supply line to one of the ports in the cylinder, plugging the remaining port(s).

4.6.18 Perform an air test by applying 80 psig (5.5 bar) to engage the tensioner. Shut off the air supply. If the air pressure does not drop below 70 psig (4.8 bar) after 10 minutes, the seals have been properly installed. If excessive leaking is found, disassemble the piston/cylinder and inspect the seals or sealing surfaces for damage, repair or replace components as required.

4.7 Bushing Replacement

Note: Some pressure plate and reaction plates have bushings installed in the reaction holes. (Typically corrosion resistant units, WCB2 tensioner/brake assemblies). See Figure 21. If applicable, replacement of the bushings can be performed per the following procedures.

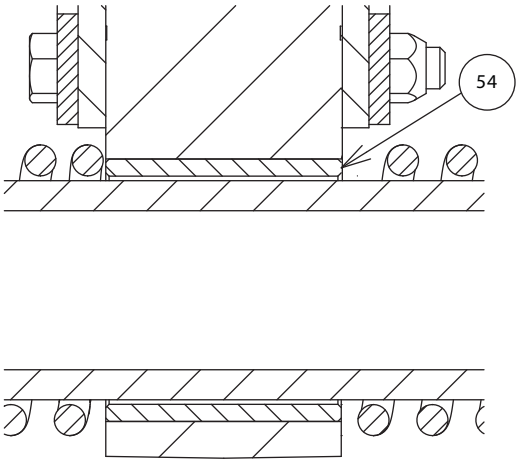


Figure 21

4.7.1 Disassemble the WCB2 tensioner/brake assembly per Section 4.3.

4.7.2 Refer to Figure 21 for the bushing location and Table 13 for the wear limits of the bushings (54) to determine if replacement is required.

4.7.3 Heat up the area around each bushing to soften the Loctite® and press out the old bushings.

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

4.7.5 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.

4.7.6 Assemble the WCB2 tensioner/brake assembly per Section 4.8, as required.

4.8 Assembly Procedures

Note: Friction disc assemblies and water jackets (mounting flange, end plate, and reaction plate- if applicable) should be assembled per the appropriate maintenance procedures prior to final assembly of the WCB2 tensioner/brake assembly.

4.8.1 Position the mounting flange (1) on a flat, level surface, mounting face down.

4.8.2 Install the studs (6) into the mounting flange. 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 Locquic® Primer Grade "T" to the threads. After the threads have dried, apply Loctite® #271 on the threads to be assembled and insert the stud completely into the threaded hole in the mounting flange so that the installed end is flush or slightly recessed inside the face of mounting flange. See Figure 1. Using a machinists square as a reference, hold the stud in position so that it remains perpendicular to the machined surface of the mounting flange until the Loctite® has cured. Repeat for the remaining studs.

⚠ **Caution**
Loctite Locquic® Primer Grade "T" contains harmful vapors. Refer to the product label and follow proper safety precautions.

⚠ **Caution**
The end of the stud must not extend past the mounting surface of the mounting flange.

4.8.3 Install the appropriate number of wear spacers (29) and clamp tubes (12) over the studs.

4.8.4 Place a friction disc assembly onto the mounting flange. Center the friction disc.

4.8.5 Install a release spring (34) over every clamp tube. For single disc WCB2 tensioner/brake assemblies, proceed to Section 4.8.9.

4.8.6 Noting the location of the water inlets in the mounting flange, lift the reaction plate (30) into position, align the water inlets with those in the mounting flange, and slide the reaction plate over the studs and clamp tubes.

4.8.7 Install a release spring (34) over every clamp tube.

4.8.8 Place friction disc assembly onto the reaction plate. Repeat the sequence of steps 4.8.5 through 4.8.8 until all friction disc assemblies, reaction plates and release springs are assembled.

4.8.9 Noting the location of the water inlets in the mounting flange, lift the pressure plate (13) into position and align the water inlets with those in the mounting flange. Slide the pressure plate over the studs and clamp tubes.

4.8.10 Thoroughly clean the seal grooves in the piston (33) and apply a thin, even coat of Molykote 55 O-ring lubricant to the piston seal grooves and chamfer on the piston, the sealing surfaces in the cylinder (19), and the seals (21) (23).

4.8.11 Install the new seals in the grooves in the piston, noting the orientation of the seal lips. See Figure 20

4.8.12 Position the cylinder on a flat level surface so that the pressure cavity faces upward.

4.8.13 Carefully place the piston onto the cylinder with the chamfered edge of the piston facing downward, taking special care to avoid damaging the seal lips.

4.8.14 Gradually apply an evenly distributed force to press the piston into the cylinder being sure not to cock the piston which may damage the sealing surfaces or seals. The use of 'C-clamps' may assist with the assembly process.

4.8.15 Lift the cylinder/piston assembly into position and slide it over the studs, noting the orientation of the ports on the cylinder face.

4.8.16 Lubricate the threads on the end of the studs with 30 wt. oil or anti-seizing compound and assemble the washers (17) and locknuts (18).

4.8.17 Tighten the locknuts, ONE TURN AT A TIME and in an alternating (crosswise) pattern until the cylinder is seated firmly against the clamp tubes. Torque the locknuts to the appropriate value. See Table 4.

⚠ **Caution**
The locknuts (18) must be tightened gradually to prevent damage to the WCB2 tensioner/brake assembly components.

4.8.18 Re-install the WCB2 tensioner/brake assembly per Section 2.0

Table 13
Wear Limits for WCB2 Components - inches (mm)

Item	Component	Description	Wear Limit / Remarks		Original Sizes/Remarks	
3	Wear Plate	Friction Wear Signature	Brake Size: 24 WCB2 36 WCB2 48 WCB2	Maximum Wear: 0.045 (1,14) 0.050 (1,27) 0.060 (1,52)	Wear will be in the form of even wear or circular grooves in the copper surface.	
8	Friction Disc	Friction Material	Fully worn at the bottom of the dust groove or wear notch, or step on O.D. for size 48WCB2. See Figure 7. Friction Material must also be replaced if contaminated with oil or grease.		Brakes have adjustment provision. See Section 4.2	
9 28	Friction Disc Core & Gear	Gear Backlash	Maximum total backlash is 0.060 (1.5).		If step is worn in gear, gear must be replaced.	
12	Clamp Tube	Reaction Area	Maximum wear is 0.015 (0.38).		Wear will be in the form of a notch or step on the side of tube.	
14 31 54	Pressure Plate Reaction Plate Bushings	Reaction Holes	Wear will be in the form of elongation of the holes. Maximum wear is 0.031 (0.80).		Original Reaction Hole and Bushing Sizes Brake Size: 24 WCB2 36 WCB2 48 WCB2	 Bore Size: 1.668 (42,88) 2.065 (52,45) 2.375 (60,33)
19	Cylinder	Seal Area	Maximum wear is 0.005 (0.13).		Wear will be in form of grooves where the seals contact the cylinder wall.	
34	Spring	Spring Free Height	Springs must be replaced in complete sets. Brake Size: 24 and 36 WCB2 48 WCB2	 Minimum Free Height: 3.88 (98,55) 4.85 (123,19)	 Brake Size: 24 and 36 WCB2 48 WCB2	 Original Free Height: 4.00 (101,6) 5.00 (127,6)

4.9 Corrosion Protection

⚠ **Caution**
All previously painted areas must be touched up after maintenance or installation to provide corrosion protection.

4.9.1 Clean any contamination, scale, or loose paint from disturbed surfaces.

4.9.2 Touch up any disturbed area with an organic zinc primer.

4.9.3 Paint areas with two coats of a high solid two part, marine grade epoxy paint as per manufacturer's instructions.

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 contact your Danfoss representative.

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Molykote® is a registered trademark of Dow Corning Corporation.

MOLUB-ALLOY® is a trademarkof Castrol Industrial Lubricants.

6.0 PARTS & KITS

6.1.1 24WCB2 Parts (Standard)

Item	Description	124WCB2 146465R Part Number	Qty	224WCB2 146466R Part Number	Qty	324WCB2 146467R Part Number	Qty	424WCB2 146468R Part Number	Qty
1	Mounting Flange Sub Assembly*	515661-01	1	515661-01	1	515661-01	1	515661-01	1
6	Stud	000245X0069	12	000245X0071	12	000245X0081	12	000245X0082	12
7	Friction Disc Sub Assembly*	513964-01	1	513964-01	2	513964-01	3	513964-01	4
12	Clamp Tube	306542-05	12	306542-20	12	306542-23	12	306542-24	12
13	Pressure Plate Sub Assembly*	515661-03	1	515661-03	1	515661-03	1	515661-03	1
17	Flat Washer	000153X0641	12	000153X0641	12	000153X0641	12	000153X0641	12
18	Locknut	000110X0073	12	000110X0073	12	000110X0073	12	000110x0073	12
19	Cylinder	513264	1	513264	1	513264	1	513264	1
21	Lip Seal	000402X0023	2	000402X0023	2	000402X0023	2	000402X0023	2
23	Lip Seal	000402X0024	2	000402X0024	2	000402X0024	2	000402X0024	2
28	Gear (not included with assembly)	411672	1	410970	1	412433	1	413195	1
29	Wear Spacer	N/A	N/A	308396	12	308396	24	308396	36
30	Reaction Plate Sub Assembly*	N/A	N/A	515661-02	1	515661-02	2	515661-02	3
33	Piston	513317	1	513317	1	513317	1	513317	1
34	Release Spring	416751-02	12	416751-02	24	416751-02	36	416751-02	48
105	Pipe Plug	000077X0021	1	000077X0021	1	000077X0021	1	000077X0021	1

*Individual parts breakdownfor standard WCB2 sub-assemblies are in Section 6.3

6.1.2 36WCB2 Parts (Standard)

Item	Description	136WCB2 146469R Part Number	Qty	236WCB2 146470R Part Number	Qty	336WCB2 146471R Part Number	Qty	436WCB2 146472R Part Number	Qty
1	Mounting Flange Sub Assembly*	515617-01	1	515617-01	1	515617-01	1	515617-01	1
6	Stud	307111-04	16	307111-10	16	307111-05	16	307111-07	16
7	Friction Disc Sub Assembly*	513990	1	513990	2	513990	3	513990	4
12	Clamp Tube	308204-07	16	308204-02	16	308204-04	16	308204-05	16
13	Pressure Plate Sub Assembly*	515617-03	1	515617-03	1	515617-03	1	515617-03	1
17	Flat Washer	000067X0042	16	000067X0042	16	000067X0042	16	000067X0042	16
18	Locknut	000110X0075	16	000110X0075	16	000110X0075	16	000110X0075	16
19	Cylinder	513988	1	513988	1	513988	1	513988	1
21	Lip Seal	000402X0005	2	000402X0005	2	000402X0005	2	000402X0005	2
23	Lip Seal	000402X0006	2	000402X0006	2	000402X0006	2	000402X0006	2
28	Gear (not included with assembly)	416538	1	416536	1	416535	1	416537	1
29	Wear Spacer	N/A	N/A	308397	16	308397	32	308397	48
30	Reaction plate Sub Assembly*	N/A	N/A	515617-02	1	515617-02	2	515617-02	3
33	Piston	512858	1	512858	1	512858	1	512858	1
34	Release Spring	416751-01	16	416751-01	32	416751-01	48	416751-01	64
105	Pipe Plug	000077X0021	1	000077X0021	1	000077X0021	1	000077X0021	1

*Individual parts breakdownfor standard WCB2 sub-assemblies are in Section 6.3

6.1.3 48WCB2 Parts (Standard)

Item	Description	148WCB2 146473R Part Number	Qty	248WCB2 146474R Part Number	Qty	348WCB2 146475R Part Number	Qty	448WCB2 146476R Part Number	Qty
1	Mounting Flange Sub Assembly*	515601-05	1	515601-05	1	515601-05	1	515601-05	1
6	Stud	307111-23	16	307111-22	16	307111-21	16	307111-20	16
7	Friction Disc Sub Assembly*	514325	1	514325	2	514325	3	514325	4
12	Clamp Tube	308440-08	16	308440-07	16	308440-06	16	308440-05	16
13	Pressure Plate Sub Assembly*	515601-01	1	515601-01	1	515601-01	1	515601-01	1
17	Flat Washer	000067X0042	16	000067X0042	16	000067X0042	16	000067X0042	16
18	Locknut	000110X0075	16	000110X0075	16	000110X0075	16	000110X0075	16
19	Cylinder	514516	1	514516	1	514516	1	514516	1
21	Lip Seal	000402X0042	2	000402X0042	2	000402X0042	2	000402X0042	2
23	Lip Seal	000402X0044	2	000402X0044	2	000402X0044	2	000402X0044	2
28	Gear (not included with assembly)	416794	1	416795	1	416688	1	416797	1
29	Wear Spacer	N/A	N/A	308398	16	308398	32	308398	48
30	Reaction plate Sub Assembly*	N/A	N/A	515601-02	1	515601-02	2	515601-02	3
33	Piston	514745	1	514745	1	514745	1	514745	1
34	Release Spring	416751-04	16	416751-04	32	416751-04	48	416751-04	64
105	Pipe Plug	000077X0021	1	000077X0021	1	000077X0021	1	000077X0021	1

*Individual parts breakdownfor standard WCB2 sub-assemblies are in Section 6.3

WCB2 Tensioner/Brake with ORB Coolant Ports

6.2.1 24WCB2 Parts (Corrosion Resistant)

Item	Description	124WCB2 146465RJ Part Number	Qty	224WCB2 146466RJ Part Number	Qty	324WCB2 146467RJ Part Number	Qty	424WCB2 146468RJ Part Number	Qty
1	Mounting Flange Sub Assembly*							515667-01	1
6	Stud							308160-08	12
7	Friction Disc Sub Assembly*							514131	4
12	Clamp Tube							308206-08	12
13	Pressure Plate Sub Assembly*							515667-03	1
17	Flat Washer							000153X0854	12
18	Locknut							000110X0076	12
19	Cylinder							514039	1
21	Lip Seal							000402X0023	2
23	Lip Seal							000402X0024	2
28	Gear (not included with assembly)							414343	1
29	Wear Spacer							308407	36
30	Reaction Plate Sub Assembly*							515667-02	3
33	Piston							513924	1
34	Release Spring							416751-02	48
105	Pipe Plug							000077X0021	1
N/A	Grease							000153X1182	1

*Individual parts breakdownfor standard WCB2 sub-assemblies are in Section 6.3

6.2.2 36WCB2 Parts (Corrosion Resistant)

Item	Description	136WCB2 146469RJ Part Number	Qty	236WCB2 146470RJ Part Number	Qty	336WCB2 146471RJ Part Number	Qty	436WCB2 146472RJ Part Number	Qty
1	Mounting Flange Sub Assembly*			515706-01	1	515706-01	1	515706-01	1
6	Stud			307111-10	16	307111-05	16	307111-07	16
7	Friction Disc Sub Assembly*			514129	2	514129	3	514129	4
12	Clamp Tube			308204-02	16	308204-04	16	308204-05	16
13	Pressure Plate Sub Assembly*			515706-03	1	515706-03	1	515706-03	1
17	Flat Washer			000067X0042	16	000153X0850	16	000153X0850	16
18	Locknut			000110X0075	16	000110X0075	16	000110X0075	16
19	Cylinder			512809	1	512809	1	512809	1
21	Lip Seal			000402X0005	2	000402X0005	2	000402X0005	2
23	Lip Seal			000402X0006	2	000402X0006	2	000402X0006	2
28	Gear (not included with assembly)			416435	1	416435	1	416495	1
29	Wear Spacer			308400	16	308400	32	308400-05	48
30	Reaction plate Sub Assembly*			515706-02	1	515706-02	2	515706-02	3
33	Piston			513872	1	513872	1	513872	1
34	Release Spring			416751-01	32	416751-01	48	416751-01	64
105	Pipe Plug			000077X0021	1	000077X0021	1	000077X0021	1
N/A	Grease			000153X1182	2	000153X1182	3	000153X1182	4

*Individual parts breakdownfor standard WCB2 sub-assemblies are in Section 6.3

6.3.1 Parts Breakdown of WCB2 Standard Mounting Flange Sub-assemblies (Item 1). Reference: Figure 22.

Size		24 WCB2		36 WCB2		48 WCB2	
Sub-Assembly Part Number		515661-01		515617-01		515601-05	
Item	Description	Part Number	Qty	Part Number	Qty	Part Number	Qty
2	Mounting Flange	515662	1	515619	1	515606	1
4	Wear Plate Screw	000153X0685	90	000153X0842	108	000153X1224	120
5	Locknut	000153X0642	90	000153X0844	108	000153X0844	120
3	Wear Plate	508459	1	416527	1	416690	1
50	Inner Support Ring	413107	3	414032-01	6	416618	5
51	Outer Support Ring	413108	5	414033-01	9	416673	10
I	Inner O-ring	N/A	N/A	N/A	N/A	000073X0410	1
O	Outer O-ring	N/A	N/A	N/A	N/A	000073X0411	1

6.3.2 Parts Breakdown of WCB2 Standard Pressure Plate Sub-assemblies (Item 13). Reference: Figure 22.

Size		24 WCB2		36 WCB2		48 WCB2	
Sub-Assembly Part Number		515661-03		515617-03		515601-01	
Item	Description	Part Number	Qty	Part Number	Qty	Part Number	Qty
14	Pressure Plate	515664	1	515618	1	515602	1
4	Wear Plate Screw	000153X0685	90	000153X0842	108	000153X1223	120
5	Locknut	000153X0642	90	000153X0844	108	000153X0884	120
3	Wear Plate	508459	1	416527	1	416690	1
50	Inner Support Ring	413107	3	414032-01	6	416618	5
51	Outer Support Ring	413108	5	414033-01	9	416673	10
I	Inner O-ring	N/A	N/A	N/A	N/A	000073X0410	1
O	Outer O-ring	N/A	N/A	N/A	N/A	000073X0411	1

6.3.3 Parts Breakdown of WCB2 Standard Reaction Plate Sub-assemblies (Item 30). Reference: Figure 22.

Size		24 WCB2		36 WCB2		48 WCB2	
Sub-Assembly Part Number		515661-02		515617-02		515601-02	
Item	Description	Part Number	Qty	Part Number	Qty	Part Number	Qty
31	Reaction Plate	515663	1	515609	1	515603	1
4	Wear Plate Screw	000153X0685	90	000153X0842	108	000153X1224	120
5	Locknut	000153X0642	90	000153X0844	108	000153X0884	120
3	Wear Plate	508459	2	416527	2	416690	2
50	Inner Support Ring	413107	6	414032-01	12	416618	10
51	Outer Support Ring	413108	10	414033-01	18	416673	20
49	Washer	N/A	N/A	N/A	N/A	N/A	N/A
I	Inner O-ring	N/A	N/A	N/A	N/A	000073X0410	1
O	Outer O-ring	N/A	N/A	N/A	N/A	000073X0411	1

6.3.4 Parts Breakdown of WCB2 Standard Friction Disc Sub-assemblies (Item 7). Reference: Figure 22.

Size		24 WCB2		36 WCB2		48 WCB2	
Sub-Assembly Part Number		513964-01		513990		514325	
Item	Description	Part Number	Qty	Part Number	Qty	Part Number	Qty
8	Friction Disc	508725	2	513658	16	514286	16
9	Friction Disc Core	510745	1	513667	1	514287	1
57	Screw	000421X0407	36	000294X0407	144	000042X0407	224

6.3.5 Parts Breakdown of WCB2 Corrosion Resistant Mounting Flange Sub-assemblies (Item 1). Reference: Figure 22.

Size		24 WCB2		36 WCB2	
Sub-Assembly Part Number		515667-01		515706-01	
Item	Description	Part Number	Qty	Part Number	Qty
2	Mounting Flange	515662	1	515619	1
4	Wear Plate Screw	000153X0685	90	000153X0842	108
5	Locknut	000153X0856	90	000153X0844	108
3	Wear Plate	508459	1	416527	1
50	Inner Support Ring	413107	3	414032-01	6
51	Outer Support Ring	413108	5	414033-01	9

6.3.6 Parts Breakdown of WCB2 Corrosion Resistant Pressure Plate Sub-assemblies (Item 13). Reference: Figure 22.

Size		24 WCB2		36 WCB2	
Sub-Assembly Part Number		515667-03		515706-03	
Item	Description	Part Number	Qty	Part Number	Qty
14	Pressure Plate	515669	1	515687	1
4	Wear Plate Screw	000153X0685	90	000153X0842	108
5	Locknut	000153X0856	90	000153X0844	108
3	Wear Plate	508459	1	416527	1
50	Inner Support Ring	413107	3	414032-01	6
51	Outer Support Ring	413108	5	414033-01	9
54	Bushing	203866-01	12	203863-04	16

6.3.7 Parts Breakdown of WCB2 Corrosion Resistant Reaction Plate Sub-assemblies (Item 30). Reference: Figure 22.

Size		24 WCB2		36 WCB2	
Sub-Assembly Part Number		515667-02		515706-02	
Item	Description	Part Number	Qty	Part Number	Qty
31	Reaction Plate	515668	1	515686	1
4	Wear Plate Screw	000153X0685	90	000153X0843	108
5	Locknut	000153X0856	90	000153X0844	108
3	Wear Plate	508459	2	416527	2
50	Inner Support Ring	413107	6	414032-01	12
51	Outer Support Ring	413108	10	414033-01	18
54	Bushing	203866-04	12	203863-03	16

6.3.8 Parts Breakdown of WCB2 Corrosion Resistant Friction Disc Sub-assemblies (Item 7). Reference: Figure 22.

Size		24 WCB2		36 WCB2	
Sub-Assembly Part Number		514131		514129	
Item	Description	Part Number	Qty	Part Number	Qty
8	Friction Disc	508725	2	513658	16
9	Friction Disc Core	514140	1	514139	1
57	Screw	000421X0407	36	000294X0407	144

WCB2 Tensioner/Brake with ORB Coolant Ports

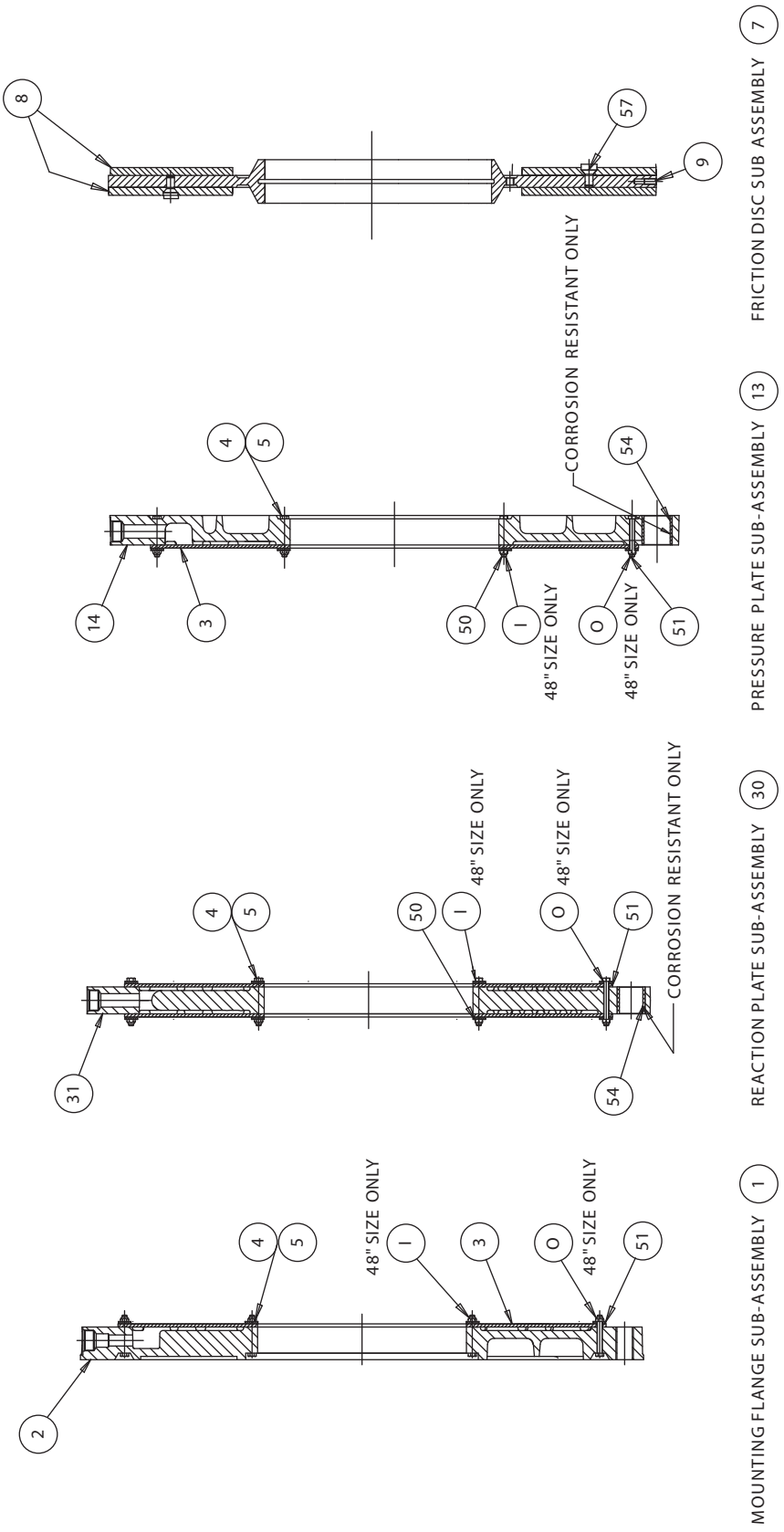


Figure 22

7.0 KITS

7.1 Friction Disc Kit (Standard)

Model	Kit P/N	Description	Friction Disc (8)	Wear Spacer (29)	Flat Head Screw (57)	Loctite® #262 Sealant	Instruction Sheet
124WCB2	107821B	Part No. Quantity	508725 2	N/A N/A	000294X0407 36	000153X1016 1	204097 1
224WCB2	107821BA	Part No. Quantity	508725 4	308396 12	000294X0407 72	000153X1016 2	204097 1
324WCB2	107821BB	Part No. Quantity	508725 6	308396 24	000294X0407 108	000153X1016 3	204097 1
424WCB2	107821BC	Part No. Quantity	508725 8	308396 36	000294X0407 144	000153X1016 4	204097 1
136WCB2	107822B	Part No. Quantity	513658 16	N/A N/A	000294X0407 144	000153X1168 1	204097 1
236WCB2	107822BA	Part No. Quantity	513658 32	308397 16	000294X0407 288	000153X1168 2	204097 1
336WCB2	107822BB	Part No. Quantity	513658 48	308397 32	000294X0407 432	000153X1168 3	204097 1
436WCB2	107822BC	Part No. Quantity	513658 64	308397 48	000294X0407 576	000153X1168 4	204097 1
148WCB2	108058B	Part No. Quantity	514286 16	N/A N/A	000294X0407 224	000153X1168 2	204097 1
248WCB2	108058BA	Part No. Quantity	514286 32	308398 16	000294X0407 448	000153X1168 3	204097 1
348WCB2	108058BB	Part No. Quantity	514286 48	308398 32	000294X0407 672	000153X1168 5	204097 1
448WCB2	108058BC	Part No. Quantity	514286 64	308398 48	000294X0407 896	000153X1168 6	204097 1

7.2 Friction Disc Kit (Corrosion Resistant)

Model	Kit P/N	Description	Friction Disc (8)	Wear Spacer (29)	Flat Head Screw (57)	Loctite® #262 Sealant	936SF MOLUB-ALLOY	Instruction Sheet
124WCB2	107821C	Part No. Quantity	508725 2	N/A N/A	000421X0407 36	000153X1016 1	000153X1182 1	204130 1
224WCB2	107821CA	Part No. Quantity	508725 4	308824 12	000421X0407 72	000153X1016 2	000153X1182 1	204130 1
324WCB2	107821CB	Part No. Quantity	508725 6	308824 24	000421X0407 108	000153X1016 3	000153X1182 1	204130 1
424WCB2	107821CC	Part No. Quantity	508725 8	308824 36	000421X0407 144	000153X1016 4	000153X1182 1	204130 1
136WCB2	107822C	Part No. Quantity	513658 16	N/A N/A	000421X0407 144	000153X1168 1	000153X1182 1	204130 1
236WCB2	107822CA	Part No. Quantity	513658 32	308425 16	000421X0407 288	000153X1168 2	000153X1182 1	204130 1
336WCB2	107822CB	Part No. Quantity	513658 48	308425 32	000421X0407 432	000153X1168 3	000153X1182 1	204130 1
436WCB2	107822CC	Part No. Quantity	513658 64	308425 48	000421X0407 576	000153X1168 4	000153X1182 4	204130 1

7.3 Cylinder Seal Kit

Size	Kit P/N	Description	Lip Seal (Inner) (21)	Lip Seal (Outer) (23)	Seal Lubricant	Instruction Sheet
24WCB2	107727C	Part No. Quantity	000402X0023 2	000402X0024 2	000153X1239 1	204067 1
36WCB2	107662C	Part No. Quantity	000402X0005 2	000402X0006 2	000153X1239 1	204067 1
48WCB2	108055C	Part No. Quantity	000402X0042 2	000402X0044 2	000153X1239 1	204067 1

7.4 Wear Plate Kit for Mounting Flange and Pressure Plate

Size	Kit P/N	Description	Screw (4)	Lock Nut (5)	Wear Plate (3)	Inner Support Ring (50)	Outer Support Ring (51)	PTFE Gasket (O.D.)	PTFE Gasket (I.D.)	Instruction Sheet
24WCB2	107727A	Part No. Quantity	000153X0642 180	000153X0685 180	508459 2	413107 6	413108 10	308581-01 2	308581-02 2	204063 1
36WCB2	107662A	Part No. Quantity	000153X0842 216	000153X0844 216	416527 2	414032-01 12	414033-01 18	308581-01 2	308581-02 2	204063 1

Size	Kit P/N	Description	Screw Pressure Plate (4)	Screw Mounting Flange (4)	Lock Nut (5)	Wear Plate (3)	Inner Support Ring (50)	Outer Support Ring (51)	Inner O-Ring (I)	Outer O-Ring (O)	Loctite #596	Instruction Sheet
48WCB2	108855A	Part No. Quantity	000153X1223 120	000153X1224 120	000153X0844 240	416690 2	416618 10	416673 20	000073X0410 2	000073X0411 2	000153X1071 3	204063 1

7.5 Wear Plate Kit for Reaction Plate

Size	Kit P/N	Description	Screw (4)	Lock Nut (5)	Washer (49)	Wear Plate (3)	Inner Support Ring (50)	Outer Suport Ring (51)	PTFE Gasket (O.D.)	PTFE Gasket (I.D.)	Instruction Sheet
24WCB2	107727E	Part No. Quantity	000153X0642 90	000153X0685 90	N/A	508459 2	413107 6	413108 10	308581-01 2	308581-02 2	204063 1
36WCB2	107662E	Part No. Quantity	000153X0843 108	000153X0844 108	N/A	416527 2	414032-01 12	414033-01 18	308581-01 2	308581-02 2	204063 1

Size	Kit P/N	Description	Screw (4)	Lock Nut (5)	Wear Plate (3)	Inner Support Ring (50)	Outer Suport Ring (51)	Inner O-Ring (I)	Outer O-Ring (O)	Loctite #596	Instruction Sheet
48WCB2	108855E	Part No. Quantity	000153X1224 120	000153X0844 120	416690 2	416618 10	416673 20	000073X0410 2	000073 X0411 2	000153X1071 3	204063 1

8.0 REVISIONS

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