

WCB11076.1 WCBD Brake Assemblies with ORB Coolant Ports
Installation, Operation and Maintenance Manual
Airflex® Product Line



Powering Business Worldwide

WCBD Brake Assemblies 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: This manual is a supplement to Airflex manual WCB 11076. For complete information on WCBD brake assemblies, obtain a copy of WCB 11076 and use it in conjunction with this manual.

Note: Part lists in this manual are specifically for WCBD assemblies that have cooling ports threaded to accept SAE O-ring boss type fittings. If you are maintaining a WCBD assembly that has cooling ports threaded to accept NPT fittings, refer to manual WCB 11070.1 for the appropriate part lists or contact the factory for additional information.

Caution

Use Only Genuine Airflex® Replacement Parts
Eaton's Airflex division 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. and Canada: (216) 281-2211
Internet: www.eaton.com/airflex

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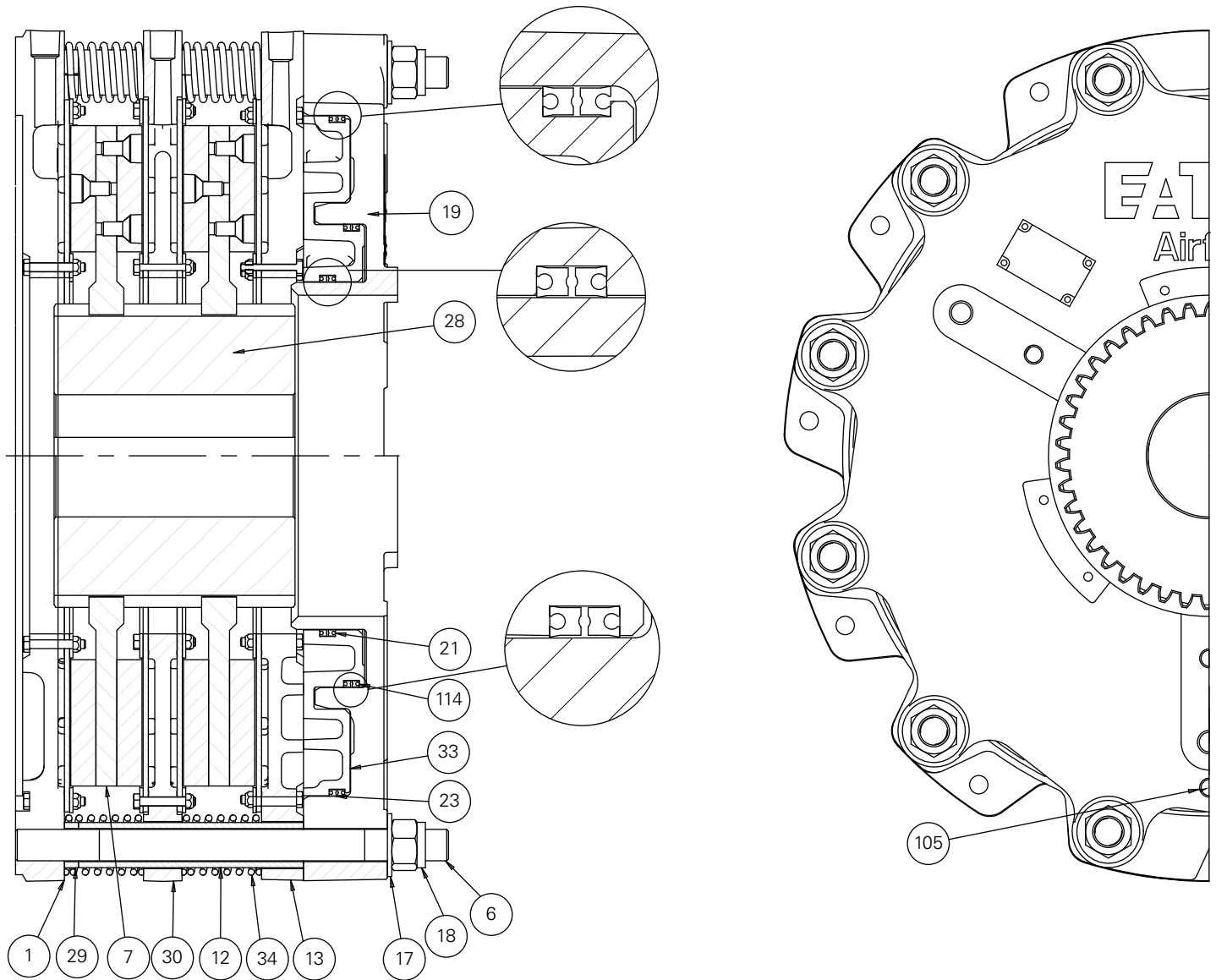



Figure 1

Table 1
Item Description

Item	Description	Item	Description	Item	Description
1	Mounting Flange S/A	18	Locknut	30	Reaction Plate S/A
6	Stud	19	Dual Cylinder	33	Dual Piston
7	Friction Disc S/A	21	Seal (Inner)	34	Release Spring
12	Clamp Tube	23	Seal (Outer)	105	Pipe Plug (36" & 48" Only)
13	Pressure Plate S/A	28	Gear (Not included)	114	Seal (Intermediate)
17	Flat Washer	29	Wear Spacer		

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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

 **Danger**  **Warning**  **Caution**
the procedures by which hazards are to be avoided.

1.1 Description

- 1.1.1 The Airflex WCBD brake assembly is identical to the Airflex WCB2 tensioner/brake's with the exception of a dual piston and cylinder that is also referred to as the "power head assembly". This manual describes the unique operation and maintenance features associated with the dual chambered power head, and is an WCBD brake assemblies addendum to the manual for the basic WCB2 tensioner/brake that has a single chambered piston and cylinder. This manual should be used in conjunction with Eaton manual WCB 11076 for installation, operation and maintenance of any WCBD brake assemblies. Refer to Eaton manual WCB 11076 for all functions and parameters of the WCBD brake assembly that are not specific to the power head subassembly, such as friction disc assembly and wear plate maintenance.

1.2 How It Works

- 1.2.1 Referring to Figure 1, the operation of the Airflex WCBD brake assembly is identical to that of the Airflex WCB2 tensioner/brake with the exception of the dual chambered piston/cylinder power head assembly. In the WCBD brake assembly, air pressure is applied to either the inner, outer, or both sets of the ports in the dual cylinder (19), causing the dual piston (33) and pressure plate assembly (13) to move towards the mounting flange, compressing the release springs. As the applied pressure to either or both of pressure chambers increases, the friction disc(s) are clamped between the pressure plate and mounting flange, stopping or controlling the shaft that the discs are mounted upon. Modulation of air pressure then controls applied torque of the WCBD brake assembly. The inner cylinder/piston chamber area of the power head is referred to as the small cylinder/piston, and the outer cylinder/piston chamber area is referred to as the large cylinder/piston.

Refer to Section 1.2 of Eaton manual WCB 11076 for additional details of operation.

- 1.1.4 All WCBD brake assemblies referred to in this IOM will 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 WCBD brake assembly during fitting installation.

1.3 WCB2 versus WCBD

- 1.3.1 The WCBD dual piston/cylinder power head offers more precise tensioning control than the WCB2 tensioner/brake by dividing the standard WCB2 tensioner/brake piston/cylinder into a small and large section. This provides the ability to improve fine modulation of clamping pressure on the friction disc assemblies and improved control over our standard single chamber design. For very light tensioning loads, the small piston can be used solely, with no pressure applied to the large piston. For larger tensioning loads, the large piston can be used solely, with no pressure applied to the small piston. For the largest tensioning loads, both pistons can be used together. The combined area of the small and large piston/cylinder power head of the WCBD brake assembly is equal to the area of the WCB2 tensioner/brake's single piston/cylinder. In this way, the maximum applied torque for both styles of WCB brake assemblies are the same.

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2.0 INSTALLATION

2.1 Preparation and Alignment

2.1.1 The preparation and alignment of the WCBD brake assembly is identical to that of the WCB2 tensioner/brake. Refer to IOM WCB 11076 for preparation and alignment procedures for the WCBD brake assembly.

2.2 Mounting

2.2.1 Mounting of the WCBD brake assembly is identical to that of the WCB2 tensioner/brake. Refer to IOM WCB 11076 for mounting procedures.

2.3 Air System



Warning

Maximum allowable air pressure to any WCBD brake assemblies pressure port is 150 psig (10.2 bar). Application of pressure exceeding maximum allowable may result in damage to the WCBD 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 2. Air inlets are located on the face of the cylinder (19). Some cylinders will have a single port to facilitate purging of moisture that may accumulate in the air system or cylinder. This lowest port should be located at or near the 6 o'clock position.

Table 2
Air Inlet Sizes (NPT)

Model	Small Cylinder (Inner Ports)	Large Cylinder (Outer Ports)
24WCBD	3/8"-18 NPT	1/2"-14 NPT
36WCBD	3/8"-18 NPT	3/4"-14 NPT
48WCBD	1/2"-14 NPT	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 elbow should be used.

2.3.5 The WCBD 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 Installation and operation of the WCBD brake assembly's coolant system is identical to the WCB2 tensioner/brake. Refer to Eaton manual WCB 11076 for cooling system procedures and parameters for the WCBD brake assemblies.

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3.0 OPERATION

3.1 Conditions of Operation

- 3.1.1 With the exception of the dual cylinder/piston power head (section 3.1.2, below), operation of the WCBD brake assembly is identical to operation of the WCB2 tensioner/brake. Refer to section 3.0 of IOM WCB 11076 for conditions of operation of the WCBD brake assembly.
- 3.1.2 When applying operation air pressure to only one of the two WCBD brake assemblies piston pressure ports (item 19), of the dual piston configuration, the second piston pressure port must be open/vented to the atmosphere, with a filter installed in the vent line, as appropriate, to avoid contamination by foreign objects into the cylinder during piston operation.

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4.0 MAINTENANCE

Note: Refer to WCB2 tensioner/brake manual WCB 11076 for maintenance of the WCBD brake assembly, with the exception of section 4.1, which covers cylinder seal replacement. The WCBD brake assembly cylinder seal replacement is covered in this manual.

4.1 Dual Cylinder Seal Replacement

4.1.1 Disconnect the air connections

4.1.2 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.

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

4.1.4 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.

4.1.5 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 any of the pressure ports on the cylinder.



Caution

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

4.1.6 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 or small brass drift 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.

4.1.7 Remove the seals. Note how the lips of the Inner (21), Outer (23), and Intermediate (114) seals are oriented. Refer to Figure 1

Note: Upon disassembly and inspection, a one-piece seal may be found for all intermediate seals (114) and on the inner (21) and outer (23) seals. These seals have since been superseded with two seals being installed 'back-to-back' as shown in Figure 1.

4.1.8 Inspect the cylinder sealing surface condition for nicks or scratches, corrosion, or any other defect which may prevent the seals from being effective. The maximum amount of radial wear on the seal surfaces is 0.005" (0,13 mm). The wear on the sealing surfaces will be in the form of grooves where the seals contact the cylinder wall. Replace the cylinder, if necessary.

4.1.9 Thoroughly clean the seal grooves in the piston (33) and apply a thin 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), and (114).

4.1.10 Install the new seals in the grooves in the piston, noting the orientation of the seal lips. See Figure 1.

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

4.1.12 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.

4.1.13 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.

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

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- 4.1.15 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).
- 4.1.16 While supporting the weight of the cylinder/piston assembly, tighten the locknuts, ONE TURN AT A TIME and in an alternating (cross-wise) pattern until the cylinder is seated firmly against the clamp tubes. Torque the locknuts to the appropriate value. See Table 3.



Caution

The locknuts (18) must be tightened gradually to prevent damage to the WCBD brake assembly's components.

- 4.1.17 Test for proper seal installation as follows:
- 4.1.17.1 There are two sets of ports on the cylinder; the outermost positioned ports connect to the larger pressure chamber. The innermost ports connect to the small pressure chamber. Remove any pipe plugs or fittings from the inner ports.
- 4.1.17.2 Install a pressure gauge in one of the outer cylinder ports. Apply 80 psig (5.1 bar) air through a second outer cylinder port after plugging the other outer NPT port to engage the WCBD.
- 4.1.17.3 After the pressure has stabilized, shut off the air supply. Monitor the pressure gauge for a drop in pressure for a period of ten minutes. If the air pressure does not drop below 60 psig (4.1 bar) within 10 minutes, the seals have been properly installed. If leakage is excessive, try to note the location of the leakage. If the intermediate seal is leaking, air will pass into the small (inner) chamber.

- 4.1.17.4 Exhaust all air pressure from the WCBD brake assembly. Remove the plugs and gauges from the outer-most ports and install them in the inner ports, leaving all of the outermost ports open.
- 4.1.17.5 Apply 80 psig (5.1 bar) air pressure through one of the inner ports in the cylinder port after plugging the other outer NPT port to engage the WCBD brake assembly.
- 4.1.17.6 After the pressure has stabilized, shut off the air supply. Monitor the pressure gauge for a drop in pressure for a period of ten minutes. If the air pressure does not drop below 60 psig (4.1 bar) within 10 minutes, the seals have been properly installed. If leakage is excessive, try to note the location of the leakage. If the intermediate seal is leaking, air will pass into the large (outer) chamber.
- 4.1.17.7 If excessive leakage is found in testing of the large or small pressure chamber, disassemble the WCBD brake assembly and check the suspect seals and sealing surfaces for damage or other causes of leakage. Repair or replace components as required.

Table 3
Fastener Description and Assembly Torque - ft.-lb. (Nm)

Item	Description	Specification	24WCBD	36WCBD	48WCBD
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)

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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
Hydraulics Group USA
Airflex Products
9919 Clinton Rd. Cleveland, Ohio 44144
Tel: (216) 281-2211
Fax: (216) 281-3890
www.eaton.com/hydraulics

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6.0 PARTS & KITS

6.1.1 24WCBD Parts (Standard)

Item	Description	124WCBD 146425RE		224WCBD 146426RE		324WCBD 146427RE		424WCBD 146428RE	
		Part Number	Qty	Part Number	Qty	Part Number	Qty	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	Lock Nut	000110X0073	12	000110X0073	12	000110X0073	12	000110X0073	12
19	Dual Cylinder	514690	1	514690	1	514690	1	514690	1
21	Seal (Inner)	000402X0023	2	000402X0023	2	000402X0023	2	000402X0023	2
23	Seal (Outer)	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	Dual Piston	514545	1	514545	1	514545	1	514545	1
34	Release Spring	416751-02	12	416751-02	24	416751-02	36	416751-02	48
114	Seal (Intermediate)	000402X0041	2	000402X0041	2	000402X0041	2	000402X0041	2

*Individual parts breakdown for standard WCB2 sub-assemblies are in section 6.4 of Eaton manual WCB 11076.

6.1.2 36WCBD Parts (Standard)

Item	Description	136WCBD 146429RE		236WCBD 146430RE		336WCBD 146413RE		436WCBD 146431RE	
		Part Number	Qty	Part Number	Qty	Part Number	Qty	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	Lock Nut	000110X0075	16	000110X0075	16	000110X0075	16	000110X0075	16
19	Dual Cylinder	514586	1	514586	1	514586	1	514586	1
21	Seal (Inner)	000402X0005	2	000402X0005	2	000402X0005	2	000402X0005	2
23	Seal (Outer)	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	Dual Piston	514485	1	514485	1	514485	1	514485	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
114	Seal (Intermediate)	000402X0040	2	000402X0040	2	000402X0040	2	000402X0040	2

*Individual parts breakdown for standard WCB2 sub-assemblies are in section 6.4 of Eaton manual WCB 11076.

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6.1.3 48WCBD Parts (Standard)

Item	Description	148WCBD 146432RE		248WCBD 146433RE		348WCBD 146434RE		448WCBD 146435RE	
		Part Number	Qty	Part Number	Qty	Part Number	Qty	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	Lock Nut	000110X0075	16	000110X0075	16	000110X0075	16	000110X0075	16
19	Dual Cylinder	514753	1	514753	1	514753	1	514753	1
21	Seal (Inner)	000402X0042	2	000402X0042	2	000402X0042	2	000402X0042	2
23	Seal (Outer)	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	Dual Piston	514484	1	514484	1	514484	1	514484	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
114	Seal (Intermediate)	000402X0043	2	000402X0043	2	000402X0043	2	000402X0043	2

*Individual parts breakdown for standard WCB2 sub-assemblies are in section 6.4 of Eaton manual WCB 11076.

6.2 Seal Kit

Model	Kit P/N	Description	Inner Seal (21)	Intermediate Seal (114)	Outer Seal (23)	Instruction Sheet
24	107727CD	Part Number Quantity	000402X0023 2	000402X0041 2	000402X0024 2	204183 1
36	107662CD	Part Number Quantity	000402X0005 2	000402X0040 2	000402X0006 2	204183 1
48	108055CD	Part Number Quantity	000402X0042 2	000402X0043 2	000402X0044 2	204183 1

Note: All kits include one 5.3 oz. tube of Dow Corning® 55 O-Ring lubricant. Part number 000153X1239

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