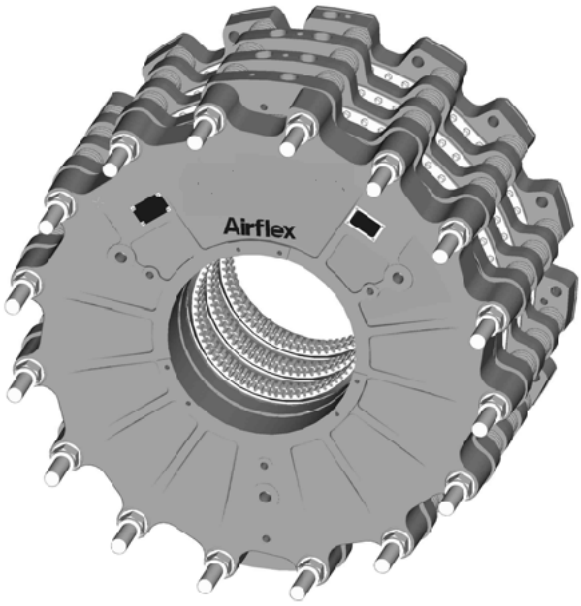
WCB 11075.1

⚠ Warning

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

Installation, Operation and Maintenance of Airflex® Model 36WCBDEP Brake Assemblies

Note: This manual is a supplement to Airflex manual WCB 11075. For complete information on WCBDEP brake assemblies, obtain a copy of WCB 11075 and use it in conjunction with this manual.



⚠ Caution

Use Only Genuine Airflex® Replacement Parts.
The Airflex Division of Danfoss Corporation recommends the use of genuine Airflex replacement parts. The use of non-genuine Airflex replacement parts could result in substandard product performance, and may void your Danfoss warranty. For optimum performance, contact Airflex:

March, 2010

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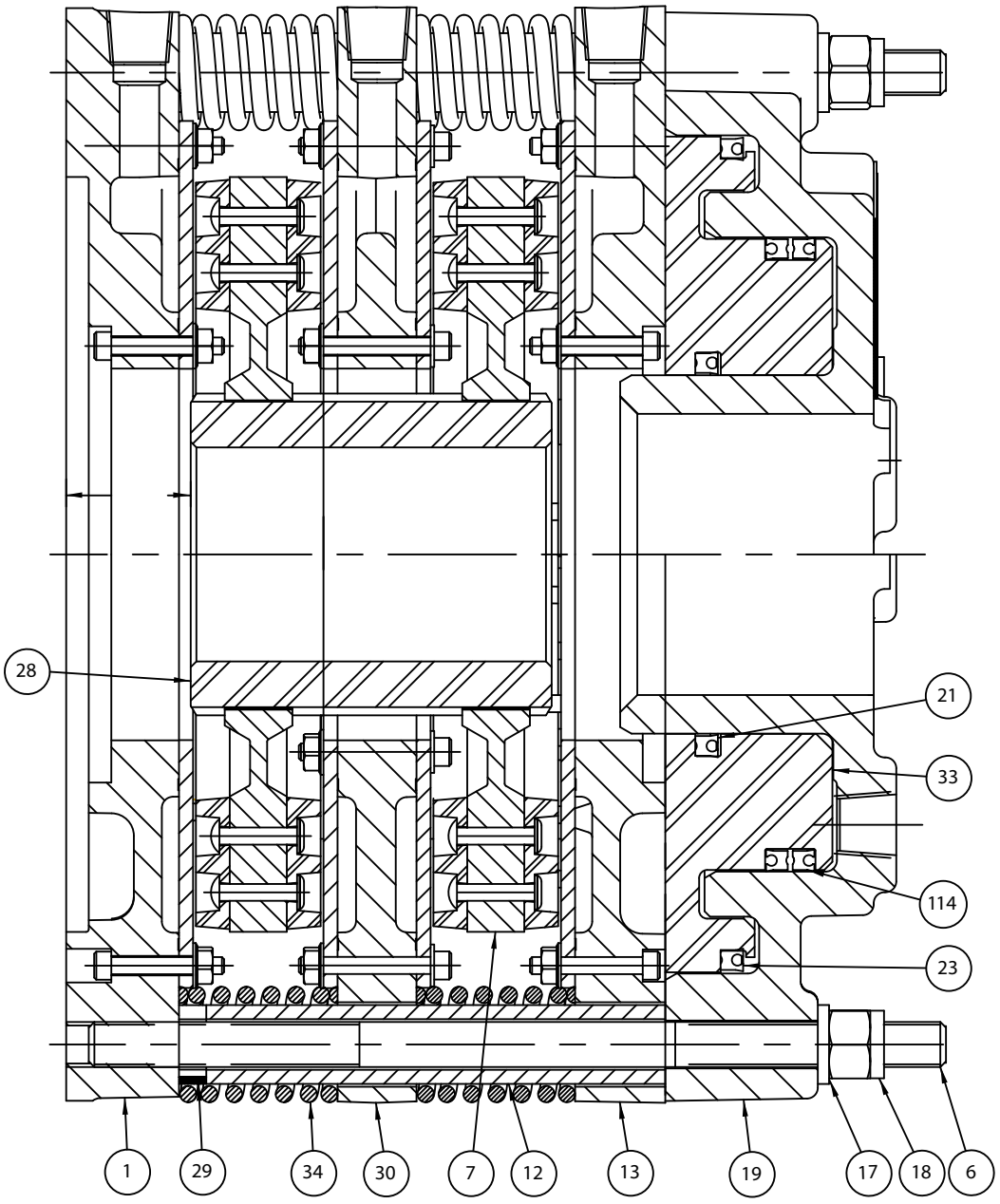

Figure 1

TABLE 1
Item Description

Item	Description	Item	Description	Item	Description
1	Mounting Flange S/A	18	Self Locking Nut	29	Wear Spacer
6	Stud	19	Cylinder	30	Reaction Plate S/A
7	Friction Disc Assembly	21	Seal (Inner)	33	Piston
12	Clamp Tube	23	Seal (Outer)	34	Release Spring
13	Pressure Plate S/A	28	Gear (Not Included in P/L)	114	Seal (Intermediate)
17	Flat Washer				

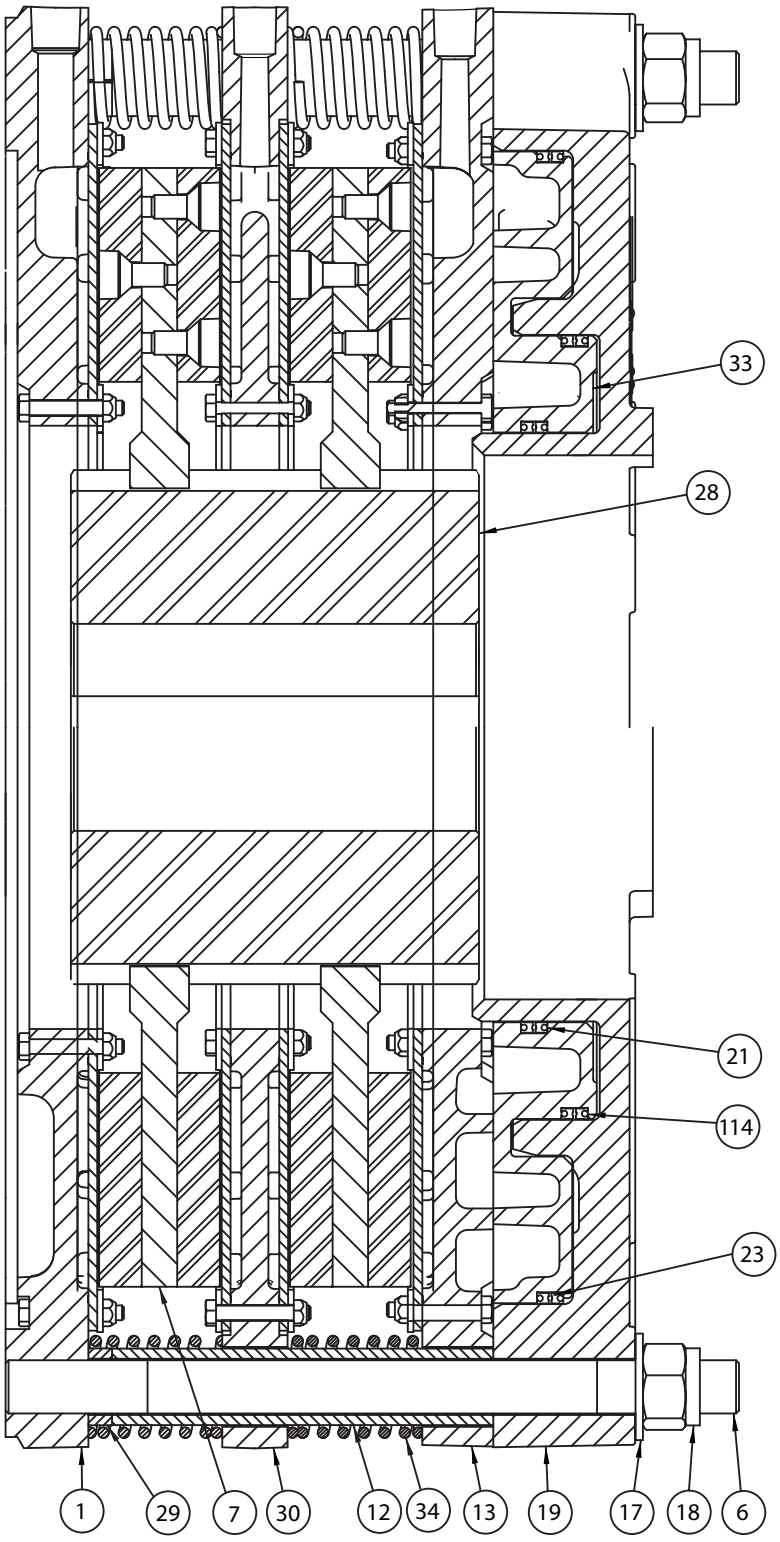

Figure 2

1.0 INTRODUCTION

Throughout this manual there are a number of HAZARD WARNINGS that must be read and adhered to in order to prevent possi ble 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 duty of all personnel involved in the installation, operation and maintenance of the equipment on which th is device is used to fully understand the

⚠ Danger

⚠ Warning

⚠ Caution

procedures by which hazards are to be avoided.

1.1 Description

1.1.1 The Airflex WCBDEP brake is identical to the Airflex WCB2EP brake 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 addendum to the manual for the basic WCB2EP brake that has a single chambered piston and cylinder. This manual should be used in conjunction with Danfoss manual WCB 11075 for installation, operation and maintenance of any WCBDEP brake. Refer to Danfoss manual WCB 11075 for all functions and parameters of the WCBDEP that are not specific to the power head subassembly, such as friction disc and wear plate maintenance.

1.2 How It Works

1.2.1 Referring to Figure 1 , the operation of the Airflex WCBDEP is identical to th at of the Airflex WCB2EP with the exception of the dual chambered piston/cylinder power head assembly. In the WCBDEP brake, 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 tensioner. The inner cylinder/piston chamber area of the power head is referred to as the sm all cylinder/piston, and the outer cylinder/piston chamber area is referred to as the large cylinder/piston.

Refer to Section 1.2 of Danfoss manual WCB 11075 for additional details of operation.

1.3 WCB2EP versus WCBDEP

1.3.1 The WCBDEP dual piston/cylinder power head offers more precise tensioning control than the WCB2EP by dividing the standard WCB2EP piston/cylinder into a small and large section. Th is provides the ability to improve fine modulation of clamping pressure on the brake discs 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 WCBDEP is equal to the area of the WCB2EP single piston/cylinder. In this way, the maximum applied torque for both styles of brakes is the same.

2.0 INSTALLATION

2.1 Preparation and Alignment

2.1.1 The preparation and alignment of the WCBDEP is identical to that of the WCB2EP. Refer to manual WCB 11075 for preparation and alignment procedures for the WCBDEP.

2.2 Mounting

2.2.1 Mounting of the WCBDEP is identical to that of the WCB2EP. Refer to manual WCB 11075 for mounting procedures.

2.3 Air System

⚠ Warning

Maximum allowable air pressure to any WCBDEP pressure port is 150 psig (10.2 bar). Application of pressure exceeding maximum allowable may result in damage to the tensioner.

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

2.3.2 Use only clean, filtered air (a 40 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)
36WCBDEP	3/8" - (18 NPT)	3/4" - (14 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 WCBDEP tensioner 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 WCBDEP coolant system is identical to the WCB2EP. Refer to Danfoss manual WCB 11075 for cooling system procedures and parameters for the WCBDEP.

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 WCBDEP is identical to operation of the WCB2EP. Refer to section 3.0 of manual WCB 11075 for conditions of operation of the WCBDEP.

3.1.2 When applying operation air pressure to only one of the two tensioner/brake 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.

4.0 MAINTENANCE

Note : Refer to WCB2EP manual WCB 11075 for maintenance of the WCBDEP brake, with the exception of section 4.6, which covers cylinder seal replacement. WCBDEP 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" (1 50 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 old seals and discard them.

Note : Some assemblies might have used a one piece bidirectional seals. These have been superceded by the use of TWO seals that fit back to back, as shown in Figures 1 and 2 .

4.1.8. Inspect the cylinder sea ling surface condition for nicks or scratches, corrosion, or any other defect which may prevent the seals from bein g effective. The maximum amount of radial wear on the seal surfaces is 0.005". 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 Dow Corning 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)(114).

4.1.10 Install the new seals in the grooves in the piston, noting the proper orientation of the seal lips. For locations where two seals are installed back to back, the O-ring expander in each seal should face away from the second seal. See Figures 1 and 2 .

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

4.1.12 Carefully place the pist on 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, sli de the cylinder/piston assembly onto the studs.

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 we ight of the cylinder/piston assembly, tighten the locknuts, ONE TURN AT A TIME and in an alternatin g (crosswise) pattern until the cylinder is seated firml y 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 tensioner components.

4.1.17 Test for proper seal installation as follows:

4.1.17.1 There are two sets of po rts on the cylinder; the outer most 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 air through a second outer cylinder port, after plugging the other outer NPT port to engage the break.

4.1.17.3 After the pressure has st abilized, 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 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 brake. Remove the plugs and gauges from the outermost ports and install them in the inner ports, leaving all of the outermost ports open.

4.1.17.5 Apply 80 psig air pressu re through one of the inner ports in the cylinder after pl ugging the other inner port to engage the break.

TABLE 3 Fastener Description and Assembly Torque - ft.lb. (Nm)		
Item # Description	Specification	36WCBDEP
18	Size	1 1/8-6 NC Gr. 8
	Torque (Lubed)	750 (1016)
Mounting Screw	Size	1-8 NC-2 Gr. 8
	Quantity	14
	Torque (Lubed)	660 (895)

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 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 wil l 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 brake and check the suspect seals and sealing surfaces for damage or other causes of leakage. Repair or replace components as required.

5.0 ORDERING INFORMATION / TECHNICAL ASSISTANCE

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

6.0 PARTS

⚠ Caution

The components listed in this manual are for the enhanced 36WCBDEP ONLY. For part reference and replacement kits for the prior model 36WCBD, refer to manual WCB 11070.1.

6.1 Parts (Standard / LO-CO)

Item	Description	136 WCBDEP 146534AE		236 WCBDEP 146538AE		336 WCBDEP 146542AE		436 WCBDEP 146547AE	
		Part Number	Qty	Part Number	Qty	Part Number	Qty	Part Number	Qty
1	Mounting Flange Sub Assembly*	515400-01	1	515400-01	1	515400-01	1	515400-01	1
6	Stud	307111-04	16	307111-10	16	307111-05	16	307111-07	16
7	Friction Disc Sub Assembly*	515404	1	515404	2	515404	3	515404	4
12	Clamp Tube	417359-01	16	417359-02	16	417359-03	16	417359-04	16
13	Pressure Plate Sub Assembly*	515400-03	1	515400-03	1	515400-03	1	515400-03	1
17	Flat Washer	000067 x 0042	16	000067 x 0042	16	000067 x 0042	16	000067 x 0042	16
18	Locknut	000110 x 0075	16	000110 x 0075	16	000110 x 0075	16	000110 x 0075	16
19	Cylinder	514586	1	514586	1	514586	1	514586	1
21	Lip Seal	000402 x 0005	2	000402 x 0005	2	000402 x 0005	2	000402 x 0005	2
23	Lip Seal	000402 x 0006	2	000402 x 0006	2	000402 x 0006	2	000402 x 0006	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	515400-02	1	515400-02	2	515400-02	3
33	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	000077 x 0021	1	000077 x 0021	1	000077 x 0021	1	000077 x 0021	1
114	Lip Seal	000402 x 0040	2	000402 x 0040	2	000402 x 0040	2	000402 x 0040	2

* - Individual parts breakdown for standard WCBDEP sub-assemblies are in section 6.4
For Item (1) Mounting Flange Sub Assembly - See Table 6.4.1
For Item (7) Friction Disc Sub Assembly - See Table 6.5.1
For Item (13) Pressure Plate Sub Assembly - See Table 6.4.2
For Item (30) Reaction Plate Sub Assembly - See Table 6.4.3

6.2 Parts (Standard / MID-CO)

Item	Description	136 WCBDEP 146534AF		236 WCBDEP 146538AF		336 WCBDEP 146542AF		436 WCBDEP 146547AF	
		Part Number	Qty	Part Number	Qty	Part Number	Qty	Part Number	Qty
1	Mounting Flange Sub Assembly*	515400-01	1	515400-01	1	515400-01	1	515400-01	1
6	Stud	307111-04	16	307111-10	16	307111-05	16	307111-07	16
7	Friction Disc Sub Asse mbly*	515401	1	515401	2	515401	3	515401	4
12	Clamp Tube	417359-01	16	417359-02	16	417359-03	16	417359-04	16
13	Pressure Plate Sub Assembly*	515400-03	1	515400-03	1	515400-03	1	515400-03	1
17	Flat Washer	000067 x 0042	16	000067 x 0042	16	000067 x 0042	16	000067 x 0042	16
18	Locknut	000110 x 0075	16	000110 x 0075	16	000110 x 0075	16	000110 x 0075	16
19	Cylinder	514586	1	514586	1	514586	1	514586	1
21	Lip Seal	000402 x 0005	2	000402 x 0005	2	000402 x 0005	2	000402 x 0005	2
23	Lip Seal	000402 x 0006	2	000402 x 0006	2	000402 x 0006	2	000402 x 0006	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	515400-02	1	515400-02	2	515400-02	3
33	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	000077 x 0021	1	000077 x 0021	1	000077 x 0021	1	000077 x 0021	1
114	Lip Seal	000402 x 0040	2	000402 x 0040	2	000402 x 0040	2	000402 x 0040	2

* - Individual parts breakdown for standard WCBDEP sub-assemblies are in section 6.4
For Item (1) Mounting Flange Sub Assembly - See Table 6.4.1
For Item (7) Friction Disc Sub Assembly - See Table 6.5.2
For Item (13) Pressure Plate Sub Assembly - See Table 6.4.2
For Item (30) Reacti on Plate Sub Assembly - See Table 6.4.3

6.3 Parts (Standard / HI-CO)

Item	Description	136WCBDEP TBD		236WCBDEP TBD		336WCBDEP TBD		436WCBDEP TBD	
		Part Number	Qty	Part Number	Qty	Part Number	Qty	Part Number	Qty
1	Mounting Flange Sub Assembly*	515400-01	1	515400-01	1	515400-01	1	515400-01	1
6	Stud	307111-04	16	307111-10	16	307111-05	16	307111-07	16
7	Friction Disc Sub Assembly*	TBD	1	TBD	2	TBD	3	TBD	4
12	Clamp Tube	417359-01	16	417359-02	16	417359-03	16	417359-04	16
13	Pressure Plate Sub Assembly*	515400-03	1	515400-03	1	515400-03	1	515400-03	1
17	Flat Washer	000067 x 0042	16	000067 x 0042	16	000067 x 0042	16	000067 x 0042	16
18	Locknut	000110 x 0075	16	000110 x 0075	16	000110 x 0075	16	000110 x 0075	16
19	Cylinder	514586	1	514586	1	514586	1	514586	1
21	Lip Seal	000402 x 0005	2	000402 x 0005	2	000402 x 0005	2	000402 x 0005	2
23	Lip Seal	000402 x 0006	2	000402 x 0006	2	000402 x 0006	2	000402 x 0006	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	515400-02	1	515400-02	2	515400-02	3
33	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	000077 x 0021	1	000077 x 0021	1	000077 x 0021	1	000077 x 0021	1
114	Lip Seal	000402 x 0040	2	000402 x 0040	2	000402 x 0040	2	000402 x 0040	2

* - Individual parts breakdown for standard WCBDEP sub-assemblies are in section 6.4
For Item (1) Mounting Flange Sub Assembly - See Table 6.4.1
For Item (7) Friction Disc Sub Assembly - See Table 6.5.3
For Item (13) Pressure Plate Sub Assembly - See Table 6.4.2
For Item (30) Reacti on Plate Sub Assembly - See Table 6.4.3

6.4 Sub-Assemblies (Standard)

6.4.1 WCBDEP Mounting Flange Sub-assemblies

Item		MODEL 36WCB2EP		
		Part Description	Part No.	
1		Sub Assembly Part #	515400-01	1
	2	Mounting Flange	513986	1
	3	Wear Plate	417335	1
	4	Screw	000153 x 0842	108
	5	Nut	000153 x 0844	108
	50	Inner Support Ring	414032-01	6
	51	Outer Support Ring	414033-01	9
		PTFE Gasket O.D.	308581-01	1
		PTFE Gasket I.D.	308581-02	1

6.4.2 WCBDEP Pressure Plate Sub-assemblies

Item		MODEL 36WCB2EP		
		Part Description	Part No .	(Qty)
13		Sub Assembly Part #	515400-03	1
	3	Wear Plate	417335	1
	4	Screw	000153 x 0842	108
	5	Nut	000153 x 0844	108
	14	Pressure Plate	512860	1
	50	Inner Support Ri ng	414032-01	6
	51	Outer Support Ring	414033-01	9
		PTFE Gasket O.D.	308581-01	1
		PTFE Gasket I.D.	308581-02	1

6.4.3 WCBDEP Reaction Plate Sub-assemblies

Item		MODEL 36WCB2EP		
		Part Description	Part No.	(Qty)
30		Sub Assembly Part #	515400-02	1
	3	Wear Plate	417335	2
	4	Screw	000153 x 0843	108
	5	Nut	000153 x 0844	108
	31	Reaction Plate	513989	1
	50	Inner Support Ring	414032-01	12
	51	Outer Support Ring	414033-01	18
		PTFE Gasket O.D.	308581-012	1
		PTFE Gasket I.D.	308581-02	2

6.5 Friction Disc Sub- Assemblies (Standard)

6.5.1 WCBDEP Friction Disc Sub-assemblies LO-CO

Item		MODEL 36 WCB2EP (LO-CO)		
		Part Description	Part No.	(Qty)
7		Sub Assembly Part #	515404	1
	8	Friction Block	515387	16
	9	Friction Disc Core	513667	1
	57	Screw	000294 x 0407	144

6.5.2 WCBDEP Friction Disc Sub-assemblies MID-CO

Item		MODEL 36WCB2EP (MID-CO)		
		Part Description	Part No.	(Qty)
7		Sub Assembly Part #	515401	1
	8	Friction Block	515388	16
	9	Friction Disc Core	513667	1
	57	Screw	000294 x 0407	144

6.5.3 WCBDEP Friction Disc Sub-assemblies HI-CO

Item		MODEL 36WCB2EP (C/R HI-CO)	
		Part Description	Part No.
7		Sub Assembly Part #	TBD
	8	Friction Block	TBD
	9	Friction Disc Core	513667
	57	Screw	000294 x 0407

7.0 KITS

7.1 Seal Kit

Parts Included in Kit		Lip Seal (Intermediate) (114)		Lip Seal (Inner) (21)		Lip Seal (Outer) (23)		Instruction Sheet	
Model	Kit P/N	Part No.	QTY	Part No.	QTY	Part No.	QTY	Part No.	QTY
36EP	107662CD	000402 x 0040	2	000402 x 0005	2	000402 x 0006	2	204183	1
All kits include one tube of Dow Corning 55 O-ring lubricant (000153 X 1239)									

8.0 REVISIONS

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

Danfoss PRODUCT WARRANTY

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

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Form ML-318
Rev. October 8, 2008

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TOMORROW

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