

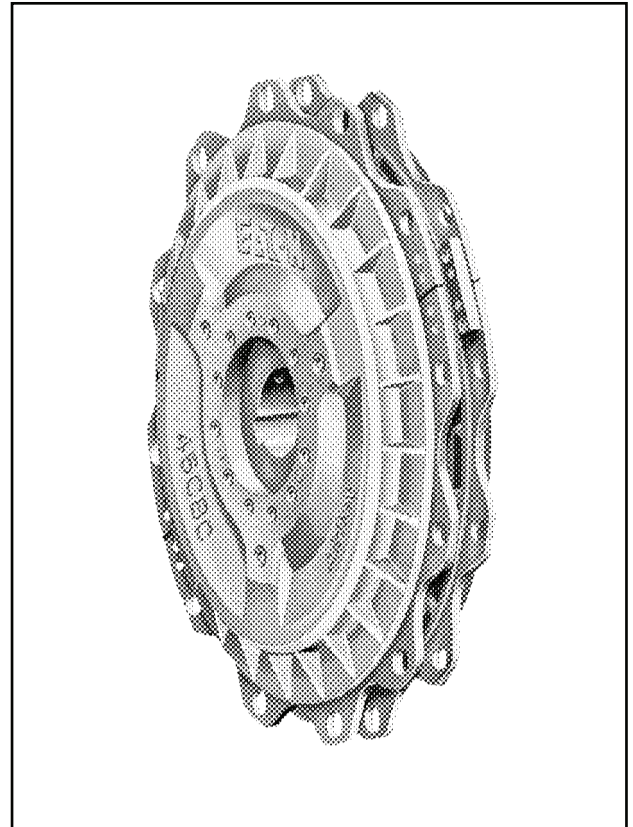
CBC 16100

**Installation, Operation
and Maintenance of
Airflex® Model
CBC Clutch\Brake
Combination**

EAT•N|Airflex®

⚠ Warning

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



⚠ Caution

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

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

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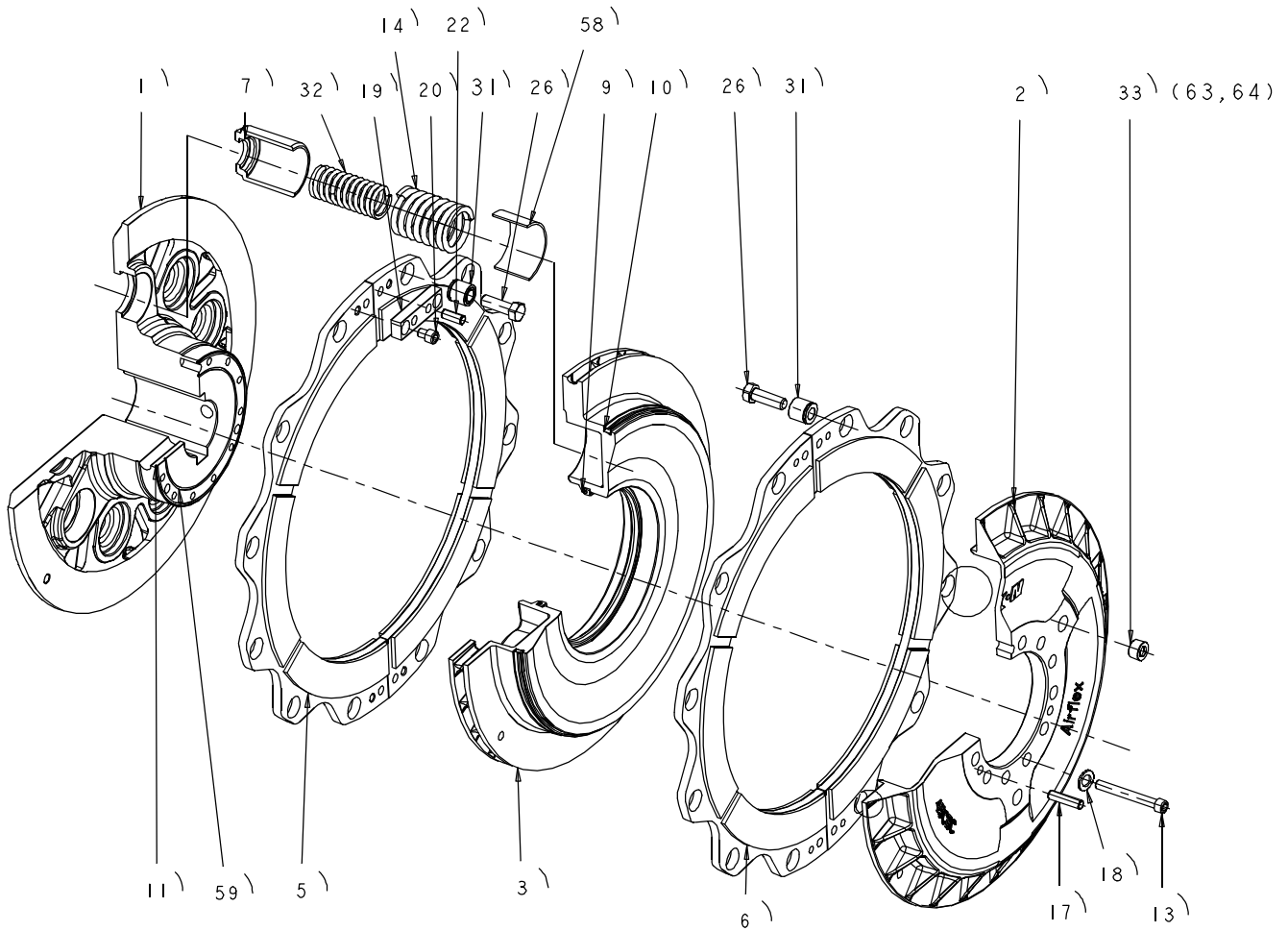
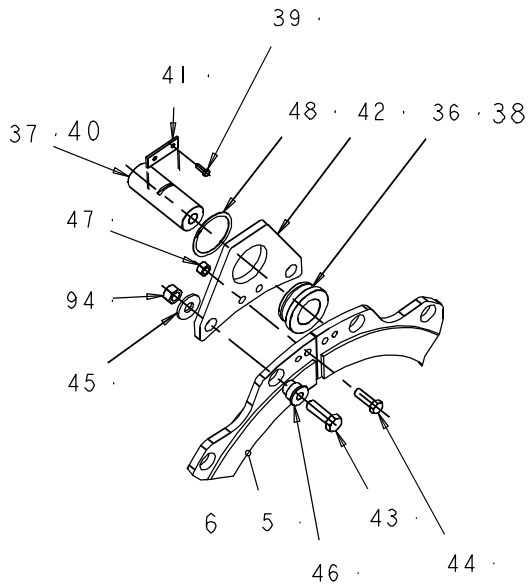
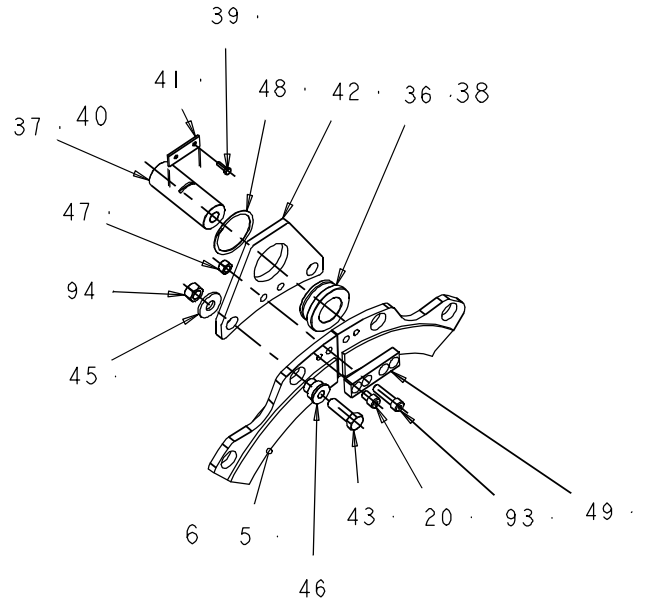


Figure 1

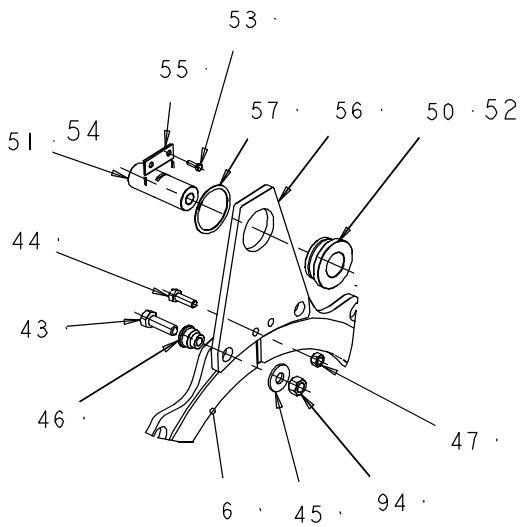
TABLE 1					
Item	Description	Item	Description	Item	Description
1	Hub	26	Hex Head Screw	48	Retaining Ring
2	Cylinder	31	Bushing	49	Strap (Sizes 30-72)
3	Piston	32	Inner Spring	50	Long Arm Bushing (Round)
5	Clutch Friction Disc	33	Plug	51	Long Arm Reaction Pin (Round)
6	Brake Friction Disc	36	Short Arm Bushing (Round)	52	Long Arm Bushing (Rectangular)
7	Torque Tube	37	Short Arm Reaction Pin (Round)	53	Hex Head Screw
9	Piston Seal (I.D.)	38	Short Arm Bushing (Rectangular)	54	Long Arm Reaction Pin (Square)
10	Piston Seal (O.D.)	39	Hex Head Screw	55	Retaining Plate
11	Face Seal	40	Short Arm Reaction Pin (Square)	56	Long Arm Reaction Arm
13	Socket Head Screw	41	Retaining Plate	57	Retaining Ring
14	Outer Spring	42	Short Reaction Arm	58	Torque Tube Bushing
17	Spring Pin	43	Hex Head Screw	59	O-Ring
18	Serrated Safety Washer	44	Hex Head Screw	63	Quick Release Valve (Not Shown)
19	Strap	45	Washer	64	Manual Release Screw (Not Shown)
20	Socket Head Screw	46	Bushing	93	Socket Head Screw



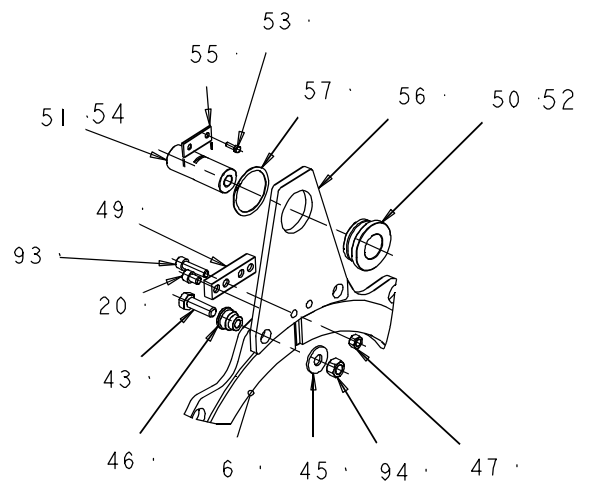
Short Arm Components
(Size 25 Only)



Short Arm Components
(Sizes 30 - 66)



Long Arm Components
(Size 25 Only)



Long Arm Components
(Sizes 30 - 66)

Figure 2

1.0 INTRODUCTION

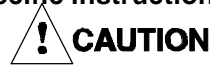
Throughout this manual there are a number of HAZARD WARNINGS that must be read and adhered to in order to prevent possible personal injury and/or damage to the equipment. Three signal words "DANGER", "WARNING", and "CAUTION" are used to indicate the severity of the hazard, and are preceded by the safety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



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



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



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

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

1.1 Description

1.1.1 The Airflex® Model CBC is a pneumatically operated clutch-brake combination, which is designed and manufactured to provide dependable clutch-brake service to a multitude of industrial applications. It is suitable for high speed and cyclic operation. The CBC requires no lubrication or adjustment.

1.2 How it Works

NOTE: Refer to Figures 1 and 2 for Item call outs, which are listed in parentheses (#).

1.2.1 The CBC hub (1) is mounted to the machine input shaft, and the cylinder (2) is attached

to the hub. These components are axially stationary. The clutch disc (5) is mounted to the machine drive system. The brake disc (6) is mounted to a stationary member, such as the machine frame. Air pressure is routed through a supply line, through a rotary seal, and into the cylinder (2). As air pressure is introduced into the cylinder cavity, the piston (3) begins to move away from the cylinder, releasing the brake friction disc (6). When the pressure builds to overcome the force of the springs (14)(32), the piston continues moving until it clamps the clutch friction disc assembly against the flange on the hub (1), engaging the clutch. As air pressure is exhausted from the cylinder cavity, the springs force the piston toward the cylinder, clamping the brake disc between the piston and cylinder to stop the machine.

1.3 Technical Information

1.3.1 Maximum speeds and pressures are shown in Table 2. Please note that the actual maximum *operating* speed for each application might be less than the maximum *allowable* speed due to the energy (heat) capacity of the CBC assembly. Contact the factory for operating limits specific to your application.



Operation at speeds and pressures that exceed the limits in Table 2 will cause damage to the CBC.

CBC Model	Maximum Speed RPM	Maximum Air Pressure	Brake Release Air Pressure	CBC Weight (lbs.)
25	1400	100 PSI	40 PSI for Standard Spring Configuration	88
30	1200			166
35	1100			221
40	1000			260
45	900			360
50	800			527
55	700			752
60	600			1173
66	550			1522

2.0 INSTALLATION

2.1 Preparation

- 2.1.1 The friction discs in the CBC can be attached to the machinery in a variety of different methods or combination of methods, depending on the machinery requirements. Figures 3 through 8 show some of the more common arrangements based on the use of short arms, long arms, or 12 guide bushings.
- 2.1.2 The machine frame and flywheel should be machined to accept the 12 point bushing fasteners or the reaction pins used with the support arms, depending on the specific arrangement selected. Refer to the appropriate assembly drawing (available upon request) for mounting hole locations, sizes and tolerances.
- 2.1.2 CBC lifting weights are shown on Table 2.



Warning:

Prior to perform any work insure that machinery is and will stay in a safe condition.



Warning:

Failure to use proper lifting equipment could result in damage to the CBC. Refer to Table 2 for gross weights of the CBC assembly.

2.2 Bore and Key Mounting (Interference Fit)

- 2.2.1 Verify the dimensions of the shaft and CBC hub to ensure that the cross drilled holes for the air passages will be properly aligned after installation of the CBC, and that the fits are as required. It is advantageous to have a shoulder or stop collar on the shaft to assist with positioning the CBC during assembly.
- 2.2.2 Prior to installing the CBC insure that the shaft and key are free of nicks and burrs. Install the key into the shaft keyway. Apply a light coat of anti-seize compound to the shaft and key to help minimize gauling.

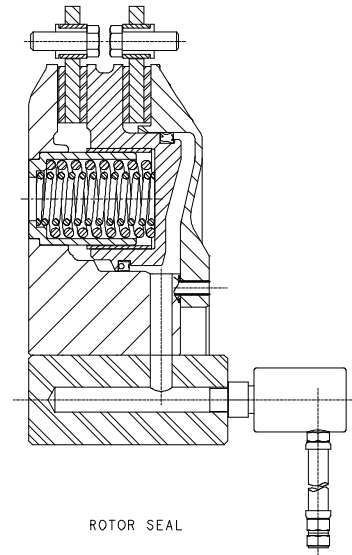


Figure 3

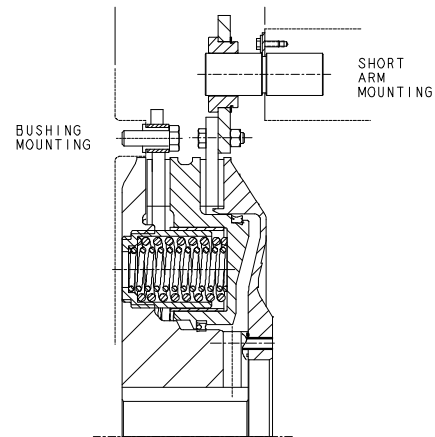


Figure 4

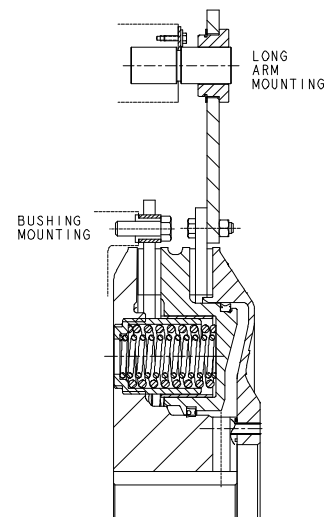


Figure 5

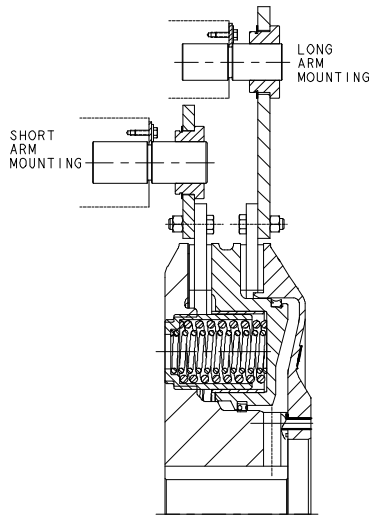


Figure 6

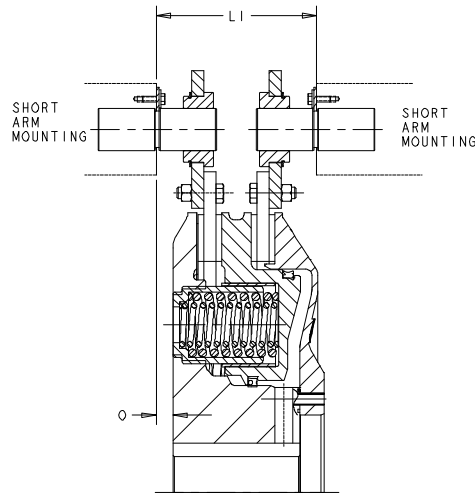


Figure 7

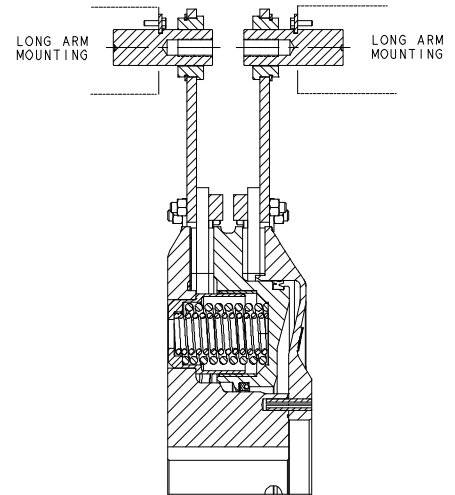


Figure 8

2.2.3 To accommodate installation for an interference fit, the hub of the CBC can be warmed to a maximum temperature of 150° F. It might also be necessary to freeze the shafting to allow for easier assembly. Rig the CBC into position. A hydraulic jack and a strong back or draw stud may be required to assist with the installation.



Caution:

Do not heat the CBC above 150°F. Heating above 150° F will cause damage to the piston seals (9)(10).

- 2.2.4 Draw the CBC onto the shaft, aligning the air hole positions. Allow to cool if heated.
- 2.2.5 See section 2.3 for bushing mounting instructions and section 2.4 for instructions outlining assembly procedures for short arm and long arm kits.

2.3 Bushing Installation (12 point support)

The following procedures cover installation of the bushings (31), when used to support the clutch or brake discs, as shown in Figures 3, 4 & 5.

2.3.1 Loosen the socket head screws (20) that secure the strap (19) to the two halves of the clutch or brake friction disc.

Note: CBC assemblies include brake discs that do not have the strap and screw installed. If mounting the brake disc with the bushings, strap kits should be purchased, which include the straps (19), screws (20), and spring pin (22) hardware. See section 8.7 for the appropriate kit part number.

2.3.2 Refer to Figure 9 for proper bushing orientation. Noting the proper orientation, insert the hex head screw (28) through the bushing. Apply Loctite® #243 to the threads of the socket head screw (28) and insert the bushing into the counterbore in the flywheel or support structure. Immediately tighten the hex head screw before the Loctite cures, tightening the screw to the torque to value listed in Table 3. Repeat these procedures to install remaining bushings.



Caution:

Loctite® #243 Must be shaken prior to application. Also Loctite® #243 may irritate sensitive skin. Refer to the product label proper application and safety instructions.

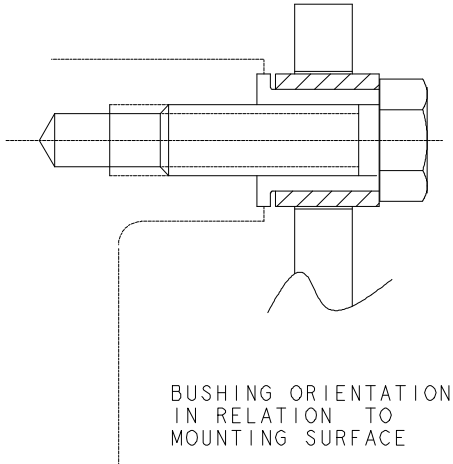


Figure 9

- 2.3.3 Ensure that the springs pins (22) are fully engaged through the friction disc core and strap (19). The ends of the spring pin should not extend beyond the face of the friction disc core or the face of the strap.
- 2.3.4 Remove each screw (20) from the strap and apply Loctite® #243 to the threads, tightening the screws to the torque value listed in Table 3. Repeat for remaining three screws. Check the friction disc assembly to be sure that it is free to float on bushings and does not bind.



Warning:
A pinch point exists when air is applied to the CBC.

- 2.3.5 When installing bushings to support brake disc assemblies (6), it might be necessary to apply air pressure to the CBC assembly, releasing the brake. Support the two halves of the brake disc when releasing the brake to prevent the brake disc halves from falling.



Caution:
A pinch point exists near the clutch and brake discs when actuating the CBC assembly.



Warning:
Maximum applied air pressure is 100 psi. Air pressures above 100 psi will cause damage to the CBC.



Caution:
Clutch and brake discs must be free to float on the bushings to prevent dragging and overheating. Be sure that they do not bind.

2.4 Short and Long Arm Installation and Assembly

2.4.1 Installation of the Reaction Pins

Install the reaction pins (37 & 40 or 51 & 54) per the following procedures. See Figure 2 for illustrations of part locations and orientation.

- 2.4.1.1 The reaction pins should be installed with an interference fit into the flywheel, machine frame, or reaction bracket, as required for the particular arrangement. See Table 3 for recommended holes sizes. All holes should be reamed smooth for good contact and fit of the pin. The edges of the holes should be slightly eased to reduce stress risers.



Warning:
Improper fits of the reaction pins could result in loosening or failure of the reaction pins, preventing the clutch or brake from functioning properly, potentially resulting in serious injury. Ensure that the reaction pins are properly fitted.

TABLE 3 Reaction Pin Hole Size		
CBC Model	Short Arm Reaction Pin (37)(40) Bore Dimension	Long Arm Reaction Pin (51)(54) Bore Dimension
25	1.1809"/1.1819"	0.8660"/0.8670"
30	1.5748"/1.5758"	1.8109"/1.8119"
35	1.5758"/1.5748"	1.1819"/1.1809"
40	1.5725"/1.5715"	1.1785"/1.1775"
45	1.7716"/1.7726"	1.5748"/1.5758"
50	2.1665"/2.1655"	1.7726"/1.7716"
55	2.1655"/2.1665"	1.7726"/1.7716"
60	2.5565"/2.5555"	2.1625"/2.1615"
66	2.5602"/2.5592"	2.1665"/2.1655"

TABLE 4
Fastener Size and Torque

CBC Model	Description	Strap Screw	Hex Head Screw	Hex Head Screw	Hex Head Screw	Nut with Nylon Insert	Hex Head Screw	Socket Head Screw	Nut with Nylon Insert
	Item Number	20	39	43	44	47	53	93	94
25	Size	M6x10	M5x16	M8x30	M8x25	M8	M5x16	N/A	---
	Torque	69 in.lb.	42 in.lb.	14 ft.lb.	14 ft.lb.	20 ft.lb.	42 in.lb.		---
30	Size	M8x16	M6x20	M10x45	---	M10	M5x16	M10x40	---
	Torque	14 ft.lb.	69 in.lb.	20 ft.lb.	---	20 ft.lb.	42 in.lb.	28 ft.lb.	---
35	Size	M8x16	M6x20	M10x45	---	M10	M5x16	M10x40	---
	Torque	14 ft.lb.	69 in.lb.	20 ft.lb.	---	20 ft.lb.	42 in.lb.	28 ft.lb.	---
40	Size	M8x16	M6x20	M10x45	---	M10	M5x16	M10x40	---
	Torque	14 ft.lb.	69 in.lb.	20 ft.lb.	---	20 ft.lb.	42 in.lb.	28 ft.lb.	---
45	Size	M12x20	M6x20	M12x75	---	M12	M6x20	M12x50	---
	Torque	49 ft.lb.	69 in.lb.	49 ft.lb.	---	49 ft.lb.	69 in.lb.	49 ft.lb.	---
50	Size	M12x20	M8x25	M12x60	---	M12	M6x20	M12x60	---
	Torque	49 ft.lb.	14 ft.lb.	49 ft.lb.	---	49 ft.lb.	69 in.lb.	49 ft.lb.	---
55	Size	M12x20	M8x25	M12x60	---	M12	M6x20	M12x60	---
	Torque	49 ft.lb.	14 ft.lb.	49 ft.lb.	---	49 ft.lb.	69 in.lb.	49 ft.lb.	---
60	Size	M12x30	M8x25	M12x70	---	M12	M8x25	M12x70	---
	Torque	49 ft.lb.	14 ft.lb.	49 ft.lb.	---	49 ft.lb.	14 ft.lb.	49 ft.lb.	---
66	Size	M12x30	M8x25	M14x70	---	M12	M8x25	M12x70	M14
	Torque	49 ft.lb.	14 ft.lb.	78 ft.lb.	---	49 ft.lb.	14 ft.lb.	49 ft.lb.	78 ft.lb.

2.4.1.2 Freeze the pins to help ease the insertion into the holes.

2.4.1.3 Noting the orientation of the slot in the side of the pin, insert the pin into the fitted hole. The slot on the side of the pin should be positioned 180 degrees from the centerline of the machine shaft, with the pin installed to the proper depth, allowing for assembly of the retaining plate. See Figure 10.

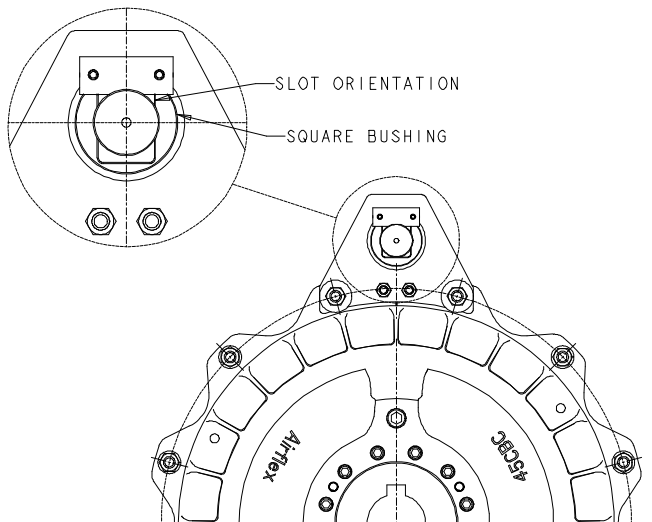


Figure 10

2.4.1.4 Assemble the retaining plate (41 or 55) to the flywheel or machine frame with the appropriate hex head screws (39 or 53). Apply Loctite #243 to the threads of the hex head screws, install and tighten to the value listed in Table 4.

2.4.2 Assembly of Support Arms

2.4.2.1 See Figure 2 to find the appropriate illustration for component locations of short or long arms.

2.4.2.2 Slide a retaining ring (48 or 57) onto the previously mounted reaction pin (37, 40, 51 or 54).

2.4.2.3 For clutch discs, remove the strap (19), socket head screws (20), and spring pins (22) and discard. Prior to removal, support the two halves of the clutch disc so that they do not fall.



Caution:

Failure to support the loose clutch or brake disc during assembly could result in personal injury or damage to the disc. Be sure that the discs are adequately supported at all times.

- 2.4.2.4 Position the arm on the outer face of the friction disc assembly and assemble it to the arm with the hex head screws (43), bushings (46), washers (45), and locknut (94). Do not tighten the fasteners at this time.
- 2.4.2.5 For sizes 30 and larger, assemble the strap (49) to the opposite face of the friction disc with socket head screws (20) and (93). For size 25, assemble socket head screws (44) and locknuts (47). Do not tighten the fasteners at this time.
- 2.4.2.6 Insert the round bushing ((36 or 51) over the reaction pin and into one of the arms, and secure it with the retaining ring (48 or 57).
- 2.4.2.7 Insert the rectangular bushing (38 or 52) into the remaining arm, noting the orientation of the rectangular slot. Proper orientation of the bushing allows for radial thermal expansion of the friction disc during operation. See Figure 10. Secure the bushing with the retaining ring (48 or 57).
- 2.4.2.8 One at a time, remove each screw that attaches the arm or strap to the friction disc, apply Loctite 243 to the threads, and tighten the screw to the appropriate torque value listed on Table 4. Repeat for each screw.

Note: For brake discs, the brake should be released (air pressure applied to the CBC assembly) to prevent binding of components during the assembly process. Be sure that the disc is properly supported to prevent it from falling.

! Caution:

Failure to support the loose clutch or brake disc during assembly could result in personal injury or damage to the disc. Be sure that the discs are adequately supported at all times.

! Caution:

Clutch and brake discs must be free to float on bushings to prevent dragging and overheating.

2.5 Air System Requirements

NOTE: Refer to Table 2 for air pressure limits.

- 2.5.1 Refer to Figure 11 for a typical air system schematic.
- 2.5.2 For air systems with restricted supply lines, a surge tank and check valve must be used to insure quick response to the clutch.
- 2.5.3 For air systems with a supply pressure that exceeds 100 psi, a pressure relief valve(100 psi) may be placed between the rotor seal and dual valve.
- 2.5.4 For faster brake response, the dual valve should be placed as close to the rotor seal as possible. A quick release valve can also be used at the rotor seal to improve the exhaust time.
- 2.5.5 Limiting the use of elbows will lower the air restriction resulting in faster brake response.
- 2.5.6 A flexible hose is required between the dual valve supply line and the rotor seal to prevent bearings in the rotor seal from being overloaded and binding.
- 2.5.7 Clean, filtered air should be supplied to the CBC. Avoid excessive air lubrication, to prevent contamination of the friction discs and surrounding components.
- 2.5.8 Be sure to follow all appropriate safety regulations specific to the machinery or industry when designing and assembling the air system.

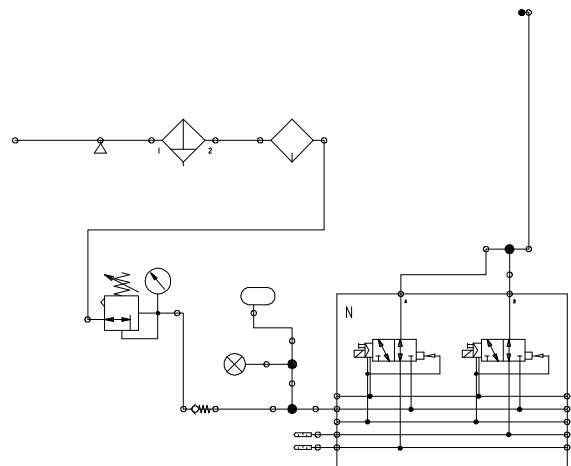


Figure 11

3.0 OPERATION

3.1 Periodic Maintenance

- 3.1.1 Inspect friction material for signs of wear. Refer to Figure 12, Table 5 and Table 9 for evaluating wear. Repair if limits are reached.
- 3.1.2 Check for air leaks in the air system and at the clutch/brake.
- 3.1.3 Check rotor seal bearings for freedom of movement
- 3.1.4 Insure that all guards are free and clear of the CBC.
- 3.1.5 Check for loose fasteners or other component damage resulting from loose fasteners. Replace, repair and secure as required in the Installation section of this manual.
- 3.1.6 Inspect arm bushings, reaction pins, and drive bushings for looseness or wear. Refer to Table 8 for wear limits. Replace as required.



Warning:

Exceeding wear limits can result in product failure.

3.2 Friction Disc Wear Inspection

- 3.2.1 Refer to Figure 12. Exhaust all air pressure and measure the "X" dimension between the clutch disc and the flange on the hub. Refer to Table 5 for wear gap limits. If the maximum gap is achieved refer to the maintenance section for repair instructions.
- 3.2.2 Check the friction disc lining thickness for wear. If the friction lining thickness on either side of the disc is less than the minimum allowable, the disc must be replaced. See Table 8 for wear limits.

CBC Model	Maximum "X" Gap
25	0.297"
30	0.327"
35	0.363"
40	0.365"
45	0.396"
50	0.435"
55	0.499"
60	0.593"
66	0.651"

4.0 MAINTENANCE



Warning:

Prior to perform any work insure that machinery is and will stay in a safe condition.



Warning:

New nylon locknuts must be used when performing maintenance on the clutch disc, brake disc, or arm supports. Failure to replace may result in inadvertent loosening and subsequent product failure, preventing the machine from functioning properly.

4.1 Removal of the CBC Assembly

- 4.1.1 Remove rotor seal and air supply lines.
- 4.1.2 Remove any interference which would keep the CBC from being removed from shaft.
- 4.1.3 Remove 4 screws (13), 90 degrees apart, from the cylinder and install high strength studs for pulling the CBC off of the shaft. Use a plate as a backing surface for a jack utilizing all four studs. Refer to Table 6 for thread size, pitch and minimum engagement.

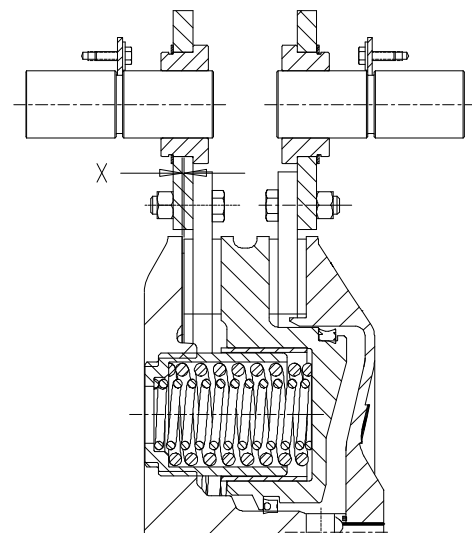


Figure 12

TABLE 6 Cylinder Screw (13) Sizes	
CBC Model	Item (13) Screw (class12.9)
25	M8x1.25 x 35 mm lg.
30	M10x1.50 x 50 mm lg.
35	M10x1.50 x 80 mm lg.
40	M12x1.75 x100 mm lg.
45	M12x1.75 x100 mm lg.
50	M14x2.0 x 100 mm lg.
55	M14x2.0 x 100 mm lg.
60	M16x2.0 x 130 mm lg.,
66	M20x2.5 x 120 mm lg.

4.1.4 Rig the CBC to support it during the removal process. See Table 2 for lifting weight.

4.1.5 Pull the CBC assembly off of the shaft and transport to a clean work space.

Note: Due to the fit between the hub and shaft, it might be necessary to heat the hub to assist with the removal from the shaft. If necessary, follow the disassembly procedures to remove the cylinder, piston and all other components prior to heating the hub.

4.1.6 Refer to sections 4.2 for disassembly and 4.3 for inspection procedures.

4.2 Disassembly of the CBC

Note: Refer to Table 8 for wear limits. Components must be repaired or replaced if wear limits are reached.



Warning:
Cylinder socket head screws (13) must be removed gradually to release the brake spring pressure. Failure to follow instruction could result in injury and/or damage to the CBC.

4.2.1 Lay the CBC assembly on a clean, flat, level working surface, hub side down. Remove the socket head screws (13), turning in 90 degree increments and following a cross-wise pattern until ALL spring force is relieved. Watch to ensure that the cylinder, screws, or spring pins (17) are not binding during the disassembly procedure.



Warning:
High spring forces are contained in the CBC assembly until fully disassembled. Avoid cocking of the cylinder during the disassembly process. Uneven loosening of the fasteners will cause the cylinder or fasteners to bind and not properly, creating a hazardous situation. Insure that spring pins (17) do not restrict the cylinder movement.

4.2.2 Lift the cylinder (2) off of the piston (3). Remove the spring pins (17) from the cylinder and/or hub (1) and set them aside.

4.2.3 Remove the brake disc (6) and set it aside, noting the orientation of the disc in the assembly in the event that it will be re-used.

4.2.4 Match mark the piston assembly (3) and hub (1). Lift the piston assembly off of the hub and set aside.

4.2.5 Remove the clutch disc assembly (5) and springs (14) (35) and set aside. Note the spring quantities, orientation and location for reassembly in the same positions.

4.3 Inspection

4.3.1 Inspect the cylinder (2) for wear and cracks, refer to Table 8. Repair or replace as required.

4.3.2 Remove the seals (9)(10) from the piston(3) assembly and discard.

4.3.3 Inspect the friction wear surfaces and torque tube wear pockets on piston (3) assembly and repair or replace.

4.3.4 Inspect the friction disc assemblies (5)(6) for wear, contamination or damage. Refer to Table 9 for friction lining wear limits. Replace as required.

4.3.5 Inspect the springs (14)(32) for free height and wear. Refer to Table 10 for limits. Replace as required.

4.3.6 Inspect the hub(1) seal surface and friction wear face for wear or damage. Repair or replace as required.

4.3.7 Inspect the torque tubes (7) for internal and

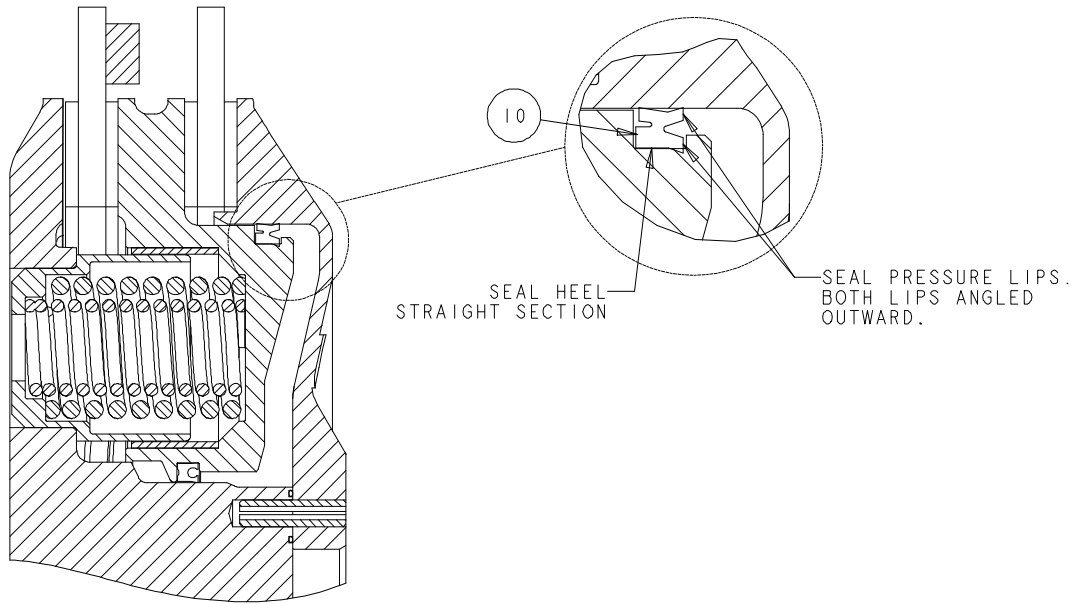


Figure 13

external wear. Press out and replace as required.

4.3.8 Inspect the bushings (58) in the piston for cracks and wear. Replace as required. Refer to section 4.6 for replacement.

4.3.9 For CBC's with short and long arms, inspect the Reaction Pins (37,40, 51 & 54) for looseness in the machine mounting holes or wear on the bushing interface. If replacement is required, refer to Table 3 for the proper holes size for reaction pins.

4.4 Assembly

4.4.1 Place the hub (1) on a flat, level working surface with seal surface facing up and the flange side down.

4.4.1.1 If torque tubes (7) were removed, apply Loctite® #620 into the appropriate counterbores in the hub(1) and press the torque tubes (7) into the mating holes in the hub until the torque tube seats flat against the hub mating surface.



Caution:
Loctite® #620 Must be shaken prior to application. Also Loctite® #620 may irritate sensitive skin. Refer to the product label proper application and safety instructions.

4.4.1.2 Install seals (11) and (59) when used - not all sizes/configurations use both seals - into the seal grooves on the face of the hub. Lubricate seal(s) in place with a light coating of Parker O-Lube®.

4.4.2 Install the springs (14)(32) into the same orientation and spring pockets in the hub from where they were removed. At minimum, one spring should be installed into each torque tube.

4.4.3 Ensure that the bushings (58) are installed in the piston prior to assembly of the piston. If installation is required, apply Loctite® #609 into the appropriate counterbore in the piston (3) as well as the O.D. of the bushing, and press the bushing (58) into the torque tube hole until it is even with the top the piston counterbore. Repeat for the remaining bushings.



Caution:
Loctite® #609 Must be shaken prior to application. Also Loctite® #609 may irritate sensitive skin. Refer to the product label proper application and safety instructions.

4.4.4 Position the cylinder (2) with the EATON Airflex CBC identification lettering facing up. Press the spring pins (17) into the cylinder (2) so that they are flush with the outer surface.

TABLE 7 Alignment Rod Specifications			
CBC Model	Maximum Diameter	Minimum Diameter	Length
25 - 30	0.332"	0.326"	9"
35 - 45	0.472	0.467"	12"
50 - 60	0.472	0.467"	16"
66	0.472	0.467"	20"

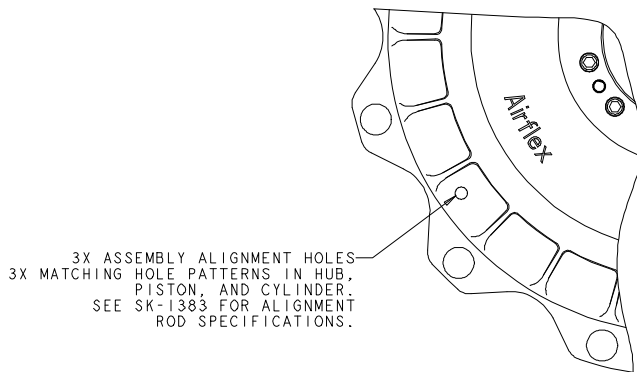


Figure 14

- 4.4.5 Apply Dow Corning® #55 lubricant to the piston seals (9)(10) and install on the piston. Refer to Figure 14 for seal orientation.
- 4.4.6 Lubricate the exposed seal lips with a thin coat of Dow Corning® #55.
- 4.4.7 Lubricate entire seal contact area of the hub(1) and cylinder (22) with a thin coat of Dow Corning® #55.
- 4.4.8 Noting the position of the torque tubes in the hub and corresponding holes in the piston, lift the piston into position and rest it on the springs. Align the springs with the spring pockets and the conical centering posts in the piston.
- 4.4.9 Install three alignment rods into the three alignment holes in the piston, as shown in Figure 15. See Table 7 for specifications of the alignment rods.
- 4.4.10 Adjust the piston (3) until the alignment rods can be installed into the hub(1) alignment holes.
- 4.4.11 Install the cylinder (2) onto the three alignment rods and the piston (3) This will seat the cylinder on the piston seals.

- 4.4.12 Install three cylinder screws (13) with three serrated safety washers (18) into the counterbored holes of the flywheel, equally spaced, adjacent to the three plugged air inlet holes on the cylinder face.

NOTE: The screws may not engage the threads at this time.

- 4.4.13 If the cylinder assembly screws have not engaged the threads in the hub, using alternate blows with a rubber mallet (dead blow hammer), tap down on the cylinder until the outer piston seal engages the cylinder bore. Use care to ensure that the seal properly engages into the cylinder without damage.

NOTE: The cylinder should be tapped down far enough so that the previously installed cylinder assembly screws will engage for about three threaded holes in the hub - DO NOT fully tap down cylinder at this time since that would not allow for assembly of the brake friction disc assembly (6).

An alternate procedure, to insure that the cylinder is not assembled too far down over the piston would be to cut three wood spacer blocks that are 1/8" thicker than the friction disc and temporary install them, equally spaced, on the upper surface of the piston ventilated rotor, adjacent to the alignment rods. After the cylinder is in position, remove the wooden blocks and continue with the assembly.

- 4.4.14 Install both halves of the brake friction disc assembly (6). For new disc assemblies, position the side marked "THIS SIDE UP" towards the cylinder, centering the friction disc relative to the cylinder O.D.. If re-using the brake disc assembly, be sure to orient the worn face against the same surface from which it was removed.

Note: Friction disc assemblies are manufactured as a matched set. To ensure proper orientation, one corner or each disc half is notched at a 45 degree angle. The notch on each disc half should be adjacent to the notch on the remaining disc half.



Caution:

Friction disc assemblies consist of "matched-pair" halves that are strapped together. For proper performance, ALWAYS use "matched-pair" halves together when installing friction disc assemblies and install them in the proper orientation, noting the position of the notched corner on the disc.

- 4.4.15 Tighten the three cylinder assembly screws (13), ONE TURN AT A TIME IN A CROSSWISE PATTERN, until the cylinder is flush with the hub face.



Caution:

Insure that the cylinder is drawn down evenly to prevent damage to the seals and/or cylinder bore causing seal leakage.

- 4.4.16 ONE AT A TIME, assemble a serrated safety washer (13) onto one of the remaining screws (13), apply a bead of Loctite® #243 to the first 10 threads at the end of the screw and install into one of the counter-bored hole. Tighten the to the specifications listed in Table 3. Repeat this procedure with the remaining screws, assembling them in a crosswise pattern. Remove the three screws initially installed in section 4.4.12, apply Loctite and reinstall, tightening to the proper torque value.
- 4.4.17 Install both halves of the clutch friction disc assembly(5). For new disc assemblies, position the side of teh friction disc assembly that is marked "THIS SIDE UP" in the upward position, and centering the friction disc relative to the cylinder. If re-using the clutch disc assembly, be sure to orient the worn face against the same surface from which it was removed.

Note: Friction disc assemblies are manufactured as a matched set. To ensure proper orientation, one corner or each disc half is notched at a 45 degree angle. The notch on each disc half should be adjacent to the notch on the remaining disc half.

- 4.4.18 For clutch discs or brake discs that will be mounted with the 12 bushings, install the straps (19) on the disc by loosely installing screws (20) to position straps. Press the spring pins (22) into the strap and into the mating holes in the friction disc core plate so that it is flush with the outer strap surface. Remove the screws and apply Loctite® #243 and install to the torque listed in Table 4.

Note: If the clutch disc will be assembled to support arms, installation of the strap is not required. Wire the two halves of the disc together to keep the discs from falling out of the assembly during storage or transport.

- 4.4.19 Refer to Section 2.0 to install the assembly.

4.5 Friction Disc Replacement

- 4.5.1 For friction lining replacement only where full disassembly of the CBC is not required, refer to section 2.0 to reference the various types of mounting arrangements.

For new disc assemblies, position the side of the friction disc assembly that is marked "THIS SIDE UP" towards the cylinder.

Note: Friction disc assemblies are manufactured as a matched set. To ensure proper orientation, one corner or each disc half is notched at a 45 degree angle. The notch on each disc half should be adjacent to the notch on the remaining disc half.



Caution:

New friction disc assemblies consist of "matched-pair" halves that are strapped together for shipping purposes. For proper performance, ALWAYS use "matched-pair" halves together when installing friction disc assemblies and install them in the proper orientation, noting the position of the notched corner on the disc.

4.6 Bushing Replacement (Item 58)

- 4.6.1 Disassemble the CBC assembly per section 4.2.
- 4.6.2 Using a long, narrow chisel, break the old bushing (58) away from the piston (3) bushing bore in several places taking care to not score the bore. Pull back on the chisel and separate bushing from cast bore. Bushing should pop out of bore once the bushing sidewall becomes loose and moves away from the casting bore. Using a propane torch you may heat the casting around the piston bushing bore to soften the locking compound. Do not exceed 200° F.



Caution:

Do not heat piston in excess of 200°F. Heat higher than 200° F may warp and/or crack the piston.

- 4.6.3 Clean the bore surface and measure for wear. Refer to Table 8 for wear limits.
- 4.6.4 Follow the assembly procedures in section 4.4.

5.0 TROUBLESHOOTING

Problem	Probable Cause	Remedy
Loss or Torque	Low Air Pressure	Increase air pressure, Insure air system is not restricted. Refer to Section 3.0 for air system setups.
	Worn Friction Disc	Measure X dimension refer in Section 3.0. replace friction discs if required.
	Contaminated Friction Disc	Clean disc with brake cleaner. Replace if required
Excessive Heat	Cycling rate too high	Reduce cycling rate
	Low air pressure	Check air system
	No ventilation holes in flywheel oor brake flange	Provide more acees holes in componants
	Excessive speed	Reduce speed

6.0 ORDERING INFORMATION / TECHNICAL ASSISTANCE

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

Eaton Corporation
 Airflex Division
 9919 Clinton Road
 Cleveland, Ohio 44144
 Tel.: (216) 281-2211
 Fax: (216)281-3890
 Internet: www.airflex.com

Loctite® is a registered trademark of Loctite

**TABLE 8
CBC Wear Limits**

Item	Description	Wear Limit	Remarks
Hub (1)	Seal Wear Area	0.008" for size 25 - 35 0.015" for sizes 40 - 66	Wear will show as a groove on the O.D. of the hub. Wear limit is value below the hub diameter.
	Friction Surface	See Table below.	Original thickness reference is the unworn area.
Cylinder (2)	Seal Surface	0.008" for size 25 - 35 0.015" for sizes 40 - 66	Wear will show as a groove in the I.D. of the cylinder. Wear limit is value greater than the cylinder diameter.
	Friction Surface	See Table below.	Original thickness reference is the unworn area.
Piston (3)	Friction Surface	See Table below.	Original thickness reference is the unworn area. Note minimum thickness value also.
Torque Tube (7)	Torque Tube	0.015" - All sizes	Wear will be in the form of a notch or step on the O.D. of the torque tube. Wear limit is value below the unworn diameter of the torque tube.
Friction Disc (5) (6)	Core plate holes (12 point bushing)	0.020" - All sizes	Maximum wear in the I.D. of each of the 12 holes that bushings (31) engage into.
	Friction Lining	See Table 9.	See Table for minimum thickness
Arm Bushing (36) (50) (38) (52)	I.D. of Bushing	0.020" - All sizes	Wear is measured in the I.D. of the part. Wear limit is value greater than the unworn I.D.
Reaction Pin (37) (51) (40) (54)	O.D. of Pin	0.030" - All sizes	Wear will be in the form of a notch or step on the O.D. of the bushing contact area on the pin. Wear limit is value below the unworn area.
Piston Bushing (58)	I.D. of Bushing	0.015" - All sizes	Wear will show as a groove in the I.D. of the part. Wear limit is value greater than the adjacent unworn area in the I.D.

**Iron Component Wear Limits
(Friction Contact Surfaces)**

Item / Size	25	30	35	40	45	50	55	60	66
Hub (1)	0.031"	0.031"	0.040"	0.029	0.038"	0.040"	0.050"	0.047"	0.045"
Cylinder (2)	0.028"	0.027"	0.032"	0.025"	0.028"	0.035"	0.041"	0.040"	0.040"
Piston (1 surface)	0.038"	0.038"	0.050"	0.056"	0.062"	0.062"	0.074"	0.088"	0.088"
Piston (3) (Minimum Thickness)	0.698"	0.768"	0.946"	1.189"	1.179"	1.302"	1.413"	1.897"	1.907"
Total Wear Allowable *	0.045"	0.049"	0.054"	0.054"	0.060"	0.064"	0.074"	0.089"	0.065"

* Total allowable accumulation of wear to all surfaces (Hub, Cylinder & Piston). After measuring each component for wear, the wear measurements should be totaled. The sum of the wear should not exceed this value. If necessary, replace some or all components to remain below this value.

TABLE 9
Friction Material Wear Limit

CBC Model	Friction Lining Thickness (NEW)	Minimum Thickness
25	0.178"	0.045"
30	0.197"	0.049"
35	0.217"	0.054"
40	0.217"	0.054"
45	0.236"	0.060"
50	0.256"	0.064"
55	0.296"	0.074"
60	0.355"	0.089"
66	0.355"	0.065"

(Item 14) - Outer Spring
(Item 32) - Inner Spring

TABLE 10
Spring Free Height

CBC Model	Spring	Spring Free Height (NEW)	Minimum Spring Free Height
25	Inner	3.750"	3.578"
	Outer	3.600"	3.432"
30	Inner	4.970"	4.761"
	Outer	4.730"	4.582"
35	Inner	6.460"	6.206"
	Outer	6.220"	5.973"
40	Inner	6.510"	6.255"
	Outer	6.130"	5.886"
45	Inner	7.130"	6.856"
	Outer	6.750"	6.488"
50	Inner	7.930"	7.632"
	Outer	7.550"	7.264"
55	Inner	9.230"	8.893"
	Outer	8.850"	8.525"
60	Inner	10.880"	10.494"
	Outer	10.500"	10.125"
66	Inner	10.380"	10.009"
	Outer	10.000"	9.640"

7.0 CBC IDENTIFICATION

7.1 Explanation of Alpha Designations

7.1.1 Bill of Material Numeric Numbers

1080XXAA ← These numbers will designate the unit size.

1080XX**AA** ← This letter designates the style of element.

- A Bore & Key
- C Rough Bore

1080XX**AA** ← The second letter designates the mounting configuration.

- A SHORT ARMS
- B LESS BUSHING
- C BUSHINGS
- D SHORT & LONG
- E BUSHING LONG ARM
- F BUSHING SHORT ARM

7.1.2 Element Assembly Number

1464**XXAA**#### ← These numbers will designate the unit (Model) size.

1464XX**AA**#### ← This letter designates the style of element.

- A BORE & KEY/ROUGH BORE
- B TAPER LOCK
- C ROUGH BORE

1464XX**AA**#### ← This letter designates the spring configuration.

Letter Designator	A	B	C	D	E	F	G	H	I	J	K	L
Outer Springs	9	9	9	9	6	6	6	6	3	3	3	3
Inner Springs	9	6	3	0	9	6	3	0	9	6	3	0
Standard Configuration		25-66 CBC										
Letter Designator	M	N	P	Q	R	S	T	U	V	W	X	
Outer Springs	0	0	0	12	12	12	12	15	15	15	15	
Inner Springs	9	6	3	9	6	3	0	9	6	3	0	

1464XXAA**####** ← The pound signs designate a unique part number for each bore size.

7.2 CBC Basic Part Number

1080XXAA	BORE AND KEY W/2 SHORT ARMS
1080XXCA	ROUGH BORE W/2 SHORT ARMS
1080XXAB	BORE AND KEY L/BUSHING MIN. BORE
1080XXCB	ROUGH BORE L/BUSHING MIN.. BORE
1080XXAC	BORE AND KEY W/BUSHING MIN.. BORE
1080XXCC	ROUGH BORE W/BUSHING MIN.. BORE
1080XXAD	BORE AND KEY W/SHORT ARM AND LONG ARM
1080XXCD	ROUGH BORE W/SHORT ARM AND LONG ARM
1080XXAE	BORE AND KEY W/BUSHING AND LONG ARM
1080XXCE	ROUGH BORE W/BUSHING AND LONG ARM
1080XXAF	BORE AND KEY W/BUSHING AND SHORT ARM
1080XXCF	ROUGH BORE W/BUSHING AND SHORT ARM

7.3 CBC Assembly Numbers

<u>Model</u>	<u>BOM</u>	<u>Element</u>	<u>Assy. drawing</u>	<u>Kits</u>
25CBC	108032	146442		146486
30CBC	108033	146443		146487
35CBC	108034	146445		146488
40CBC	108035	146446	514777	146489
45CBC	108036	146438	514737	146490
50CBC	108037	146488	514776	146491
55CBC	108038	146449	514764	146492
60CBC	108039	146450	514833	146493
66CBC	108040	146451	514841	146494

7.4 CBC Kit Alpha Designations

Kit Description	Alpha Designation
Bushing Kit	AA
Short Arm Kit	BB
Long Arm Kit	CC
Lining Kit	DD
Element Seal Kit	FF
Shaft Seal Kit	GG
Shaft Seal Repair Kit	HH
Strap Kit	JJ

EXAMPLE: 45CBCLONG ARM KIT = **146490CC**

Kit	Item	Contents
Bushing Kit	31	12 Bushings
	26	12 Bolts
	-	Loctite®
Short Arm Kit	-	Short Arm Hardware
	-	Loctite®
Long Arm Kit	-	Long Arm Hardware
	-	Loctite®
Lining Kit	5(6)	Friction Disc
Element Seal Kit	-	Inner Piston Seal
	-	Outer Piston Seal
	-	Inner Face seal
	-	Outer Face Seal
	-	Dow® 55 O-ring Lube
Strap Kit	19	Strap
	20	Four Bolts
	22	Four Spring Pins

8.0 PARTS AND KITS

8.1 Rough Bore & Key Assembly

Item	Description	Model		Model		Model		Model		Model	
		25 CBC 146442AB	Qty	30 CBC 146443AB	Qty	35 CBC 146445AB	Qty	40 CBC 146445AB	Qty	45 CBC 146438AB	Qty
1	Hub	514911-####	1	514903-####	1	514890-####	1	514799-####		514765-####	1
2	Cylinder	514907-0100	1	514899-0100	1	514886-0100	1	514803-0100	1	514739-0100	1
3	Piston	514909	1	514901	1	514888	1	514801	1	514741	1
5	Friction Disc	416860	2	416917	2	416918	2	416855	2	416812	2
7	Torque Tube	416815-05	3	416815-06	3	416815-07	3	416815-08	3	416815-09	3
9	Piston Seal (I.D.)	000402x0066	1	000402x0065	1	000402x0064	1	000402x0056	1	000402x0055	1
10	Piston Seal (O.D.)	000431x0010	1	000431x0009	1	000431x0008	1	000431x0007	1	000431x0006	1
11	Face Seal (outer)	000073x0402	1	000073x0401	1	000073x0400	1	000073x0392	1	000073x0393	1
13	Socket Head Screw	000401x0026	12	000401x0025	12	000401x0024	12	000401x0018	12	000401x0018	12
14	Outer Spring	416816-17	9	416816-15	9	416816-13	9	416816-01	9	416816-03	9
17	Spring Pin	000382x0054	3	000382x0043	3	000382x0043	3	000382x0030	3	000382x0036	3
18	Serrated Safety	000404x0001	12	000404x0003	12	000404x0003	12	000404x0009	12	000404x0009	12
19	Strap	416810-04	2	416810-03	2	416810-03	2	416810-03	2	416810-02	2
20	Socket Head Screw	000433x0601	4	000433x0801	4	000433x0801	4	000433x0801	4	000433x1201	4
22	Spring Pin	000382x0051	4	000382x0047	4	000382x0047	4	000382x0047	4	000382x0048	4
32	Inner Spring	416816-18	6	416816-16	6	416816-14	6	416816-02	6	416816-04	6
33	Pipe Plug	000077x0003	3	000077x0003	3	000077x0003	3	000077x0008	3	000077x0008	3
58	Polylube Bushing	000432x0008	3	000432x0007	3	000432x0006	3	000432x0006	3	000432x0005	3
59	O-ring	000073x0403	1	000073x0297	1	000073x0297	1	000073x0390	1	000073x0391	1

Item	Description	Model	Qty	Model	Qty	Model	Qty	Model	Qty
		50 CBC 146448AB		55 CBC 146449AB		60 CBC 146450AB		66 CBC 146496AB	
1	Hub	514784-####	1	514796-####	1	514840-####	1	514848-####	1
2	Cylinder	514779-0100	1	514791-0100	1	514835-0100	1	514843-0100	1
3	Piston	514781	1	514793	1	514837	1	514845	1
5	Friction Disc	416856	2	416857	2	416858	2	416859	2
7	Torque Tube	416815-10	3	416815-11	3	416815-12	3	416815-13	3
9	Piston Seal (I.D.)	000402x0054	1	000402x0053	1	000402x0052	1	000402x0051	1
10	Piston Seal (O.D.)	000431x0005	1	000431x0004	1	000431x0003	1	000431x0002	1
11	Face Seal (outer)	000073x0395	1	000073x0396	1	000073x0397	1	000073x0398	1
13	Socket Head Screw	000401x0019	12	000401x0020	12	000401x0021	12	000401x0022	12
14	Outer Spring	416816-05	9	416816-07	9	416816-09	9	416816-11	9
17	Spring Pin	000382x0036	3	000382x0036	3	000382x0036	3	000382x0056	4
18	Serrated Safety	000404x0010	12	000404x0010	12	000404x0007	12	000404x0012	12
19	Strap	416810-02	2	416810-02	2	416810-01	2	416810-01	2
20	Socket Head Screw	000433x1201	4	000433x1201	4	000433x1204	4	000433x1204	4
22	Spring Pin	000382x0048	4	000382x0049	4	000382x0050	4	000382x0050	4
32	Inner Spring	416816-06	6	416816-08	6	416816-10	6	416816-12	6
33	Pipe Plug	000077x0008	3	000077x0008	3	000077x0008	3	000077x0007	3
58	Polylube Bushing	000432x0004	3	000432x0003	3	000432x0002	3	000432x0002	3
59	O-ring	000073x0399	1	000073x0394	1	000073x0396	1	000073x0396	1

8.2 12 Point Bushing Kit

Item	Description	Model		Model		Model		Model		Model	
		25 CBC 146486AA	Qty	30 CBC 146487AA	Qty	35 CBC 146488AA	Qty	40 CBC 146489AA	Qty	45 CBC 146490AA	Qty
26	Hex Head Screw	000391x1002	12	000391x1401	12	000391x1401	12	000391x1401	12	000391x1607	12
31	CBC Clutch Bushing	416809-05	12	416809-06	12	416809-07	12	416809-07	12	416809-08	12
-	Loctite® #243, 10ml	000153x1238	1	000153x1238	1	000153x1238	1	000153x1238	1	000153x1238	1
-	CBC 16100.1, Instruction Sheet	204178	1	204178	1	204178	1	204178	1	204178	1
Item	Description	Model		Model		Model		Model			
		50 CBC 146491AA	Qty	55 CBC 146492AA	Qty	60 CBC 146493AA	Qty	66 CBC 146494AA	Qty		
26	Hex Head Screw	000391x2007	12	000391x2406	12	000391x2406	12	000391x3002	12		
31	CBC Clutch Bushing	416809-09	12	416809-10	12	416809-11	12	416809-12	12		
-	Loctite® #243, 10ml	000153x1238	1	000153x1238	1	000153x1238	1	000153x1238	1		
-	CBC 16100.1, Instruction Sheet	204178	1	204178	1	204178	1	204178	1		

8.3 CBC Lining Kit

Item	Description	Model		Model		Model		Model		Model	
		25 CBC 146486DD	Qty	30 CBC 146487DD	Qty	35 CBC 146488DD	Qty	40 CBC 146489DD	Qty	45 CBC 146490DD	Qty
5	Friction Disc Assembly	416860	1	416917	1	416918	1	416855	1	416812	1
19	CBC Clutch Strap	416810-04	2	416810-03	2	416810-03	2	416810-03	2	416810-02	2
20	Socket Head Screw (low head)	000433x0601	4	000433x0801	4	000433x0801	4	000433x0801	4	000433x1201	4
22	Roll Pin	000382x0051	4	000382x0047	4	000382x0047	4	000382x0047	4	000382x0048	4
-	CBC 16100.1 Instruction Manual	204178	1	204178	1	204178	1	204178	1	204178	1
-	Loctite® #243, 10 ml Bottle	000153x1238	1	000153x1238	1	000153x1238	1	000153x1238	1	000153x1238	1
Item	Description	Model		Model		Model		Model			
		50 CBC 146491DD	Qty	55 CBC 146492DD	Qty	60 CBC 146493DD	Qty	66 CBC 146494DD	Qty		
5	Friction Disc Assembly	416856	1	416857	1	416858	1	416859	1		
19	CBC Clutch Strap	416810-02	2	416810-02	2	416810-01	2	416810-01	2		
20	Socket Head Screw (low head)	000433x1201	4	000433x1201	4	000433x1204	4	000433x1204	4		
22	Roll Pin	000382x0048	4	000382x0049	4	000382x0050	4	000382x0050	4		
-	CBC 16100.1 Instruction Manual	204178	1	204178	1	204178	1	204178	1		
-	Loctite® #243, 10 ml Bottle	000153x1238	1	000153x1238	1	000153x1238	1	000153x1238	1		

8.4 CBC Long Arm Kit

Item	Description	Model		Model		Model		Model		Model	
		25 CBC 146486CC	Qty	30 CBC 146487CC	Qty	35 CBC 146488CC	Qty	40 CBC 146489CC	Qty	45 CBC 146490CC	Qty
43	Hex Head Screw	000391x0803	4	000433x0801	4	000433x0801	4	000433x0801	4	000433x1201	4
44	Hex Head Screw	000391x0802	8	000391x1004	4	000391x1004	4	000391x1004	4	000391x1202	4
45	Flat Washer	000067x0057	4	-	-	-	-	-	-	-	-
46	CBC Arm Step Bushing	308380-04	4	000067x0051	4	000067x0051	4	000067x0051	4	000067x0052	4
47	Lock Nut	000414x0008	4	308380-05	4	308380-05	4	308380-05	4	308380-06	4
49	CBC arm backing Plate	-	-	000414x0009	8	000414x0009	8	000414x0009	8	000414x0010	8
50	CBC Round Reaction Pin	416804-02	1	416808-03	2	416808-03	2	416808-03	2	416808-02	2
51	CBC Round Reaction Pin	416802-02	1	416804-03	1	416804-03	1	416804-03	1	416804-04	1
52	CBC Square Reaction Pin	416805-02	1	416802-03	1	416802-03	1	416802-03	1	416802-04	1
53	Hex Head Screw	000391x0503	4	416805-03	1	416805-03	1	416805-03	1	416805-04	1
54	CBC Square Reaction Pin	416803-02	1	000391x0503	4	000391x0503	4	000391x0503	4	000391x0601	4
55	CBC Retaining Plate	308381-02	2	416803-03	1	416803-03	1	416803-03	1	416803-04	1
56	CBC Long ArmPlate	416807-05	2	308381-02	2	308381-02	2	308381-02	2	308381-03	2
57	Snap Ring	000190x0104	2	416807-06	2	416807-07	2	416807-08	2	416807-09	2
93	Socket Head Screw	-	-	000190x0103	2	000190x0103	2	000190x0103	2	000190x0102	2
94	Lock Nut	-	-	000433x1002	4	000433x1002	4	000433x1001	4	000433x1202	4
-	Loctite® #243, 10 ml	000153x1238	1	-	-	-	-	-	-	-	-
-	CBC 16100.1, Instruction sheet	204178	1	000153x1238	1	000153x1238	1	000153x1238	1	000153x1238	1

Item	Description	Model		Model		Model		Model	
		50 CBC 146491CC	Qty	55 CBC 146492CC	Qty	60 CBC 146493CC	Qty	66 CBC 146494CC	Qty
20	Socket Head Screw	000433x1201	4	000433x1201	4	000433x1204	4	000433x1204	4
43	Hex Head Screw	000391x1207	4	000391x1207	4	000391x1209	4	000391x1403	4
44	Hex Head Screw	-	-	-	-	-	-	-	-
45	Flat Washer	000067x0053	4	000067x0053	4	000067x0054	4	000067x0055	4
46	CBC Arm Step Bushing	308380-07	4	308380-07	4	308380-08	4	308380-09	4
47	Lock Nut	000414x0010	8	000414x0010	8	000414x0010	8	000414x0010	4
49	CBC arm backing Plate	416808-02	2	416808-02	2	416808-01	2	416808-01	2
50	CBC Round Reaction Pin	416804-05	1	416804-05	1	416804-06	1	416804-06	1
51	CBC Round Reaction Pin	416802-05	1	416802-05	1	416802-06	1	416802-06	1
52	CBC Square Reaction Pin	416805-05	1	416805-05	1	416805-06	1	416805-06	1
53	Hex Head Screw	000391x0601	4	000391x0601	4	000391x0802	4	000391x0802	4
54	CBC Square Reaction Pin	416803-05	1	416803-05	1	416803-06	1	416803-06	1
55	CBC Retaining Plate	308381-03	2	308381-03	2	308381-04	2	308381-04	2
56	CBC Long ArmPlate	416807-10	2	416807-10	2	416807-12	2	416807-13	2
57	Snap Ring	000190x0101	2	000190x0101	2	000190x0100	2	000190x0100	2
93	Socket Head Screw	000433x1203	4	000433x1203	4	000433x1205	4	000433x1205	4
94	Lock Nut	-	-	-	-	-	-	000414x0003	4
-	Loctite® #243, 10 ml	000153x1238	1	000153x1238	1	000153x1238	1	000153x1238	1
-	CBC 16100.1, Instruction sheet	204178	1	204178	1	204178	1	204178	1

8.5 CBC Short Arm Kit

Item	Description	Model		Model		Model		Model		Model	
		25 CBC 146486BB	Qty	30 CBC 146487BB	Qty	35 CBC 146488BB	Qty	40 CBC 146489BB	Qty	45 CBC 146490BB	Qty
20	Socket Head Screw			000433x0009	4	000433x0801	4	000433x0801	4	000433x1201	4
36	CBC Round Reaction Pin Bushing	416804-03	1	416804-04	1	416804-04	1	416804-04	1	416804-05	1
37	CBC Round Reaction Pin	416802-03	1	416802-04	1	416802-04	1	416802-04	1	416802-05	1
38	CBC Square Reaction Pin Bushing	416805-03	1	416805-04	1	416805-04	1	416805-04	1	416805-05	1
39	Hex Head Screw	000391x0503	4	000391x0601	4	000391x0601	4	000391x0601	4	000391x0601	4
40	CBC Square Reaction Pin	416803-03	1	416803-04	1	416803-04	1	416803-04	1	416803-05	1
41	CBC Retainer Plate	308381-02	2	308381-03	2	308381-03	2	308381-03	2	308381-03	2
42	CBC Short Arm Plate	416806-05	2	416806-06	2	416806-07	2	416806-08	2	416806-09	2
43	Hex Head Screw	000391x0803	8	000391x1005	4	000391x1005	4	000391x1005	4	000391x1202	4
44	Hex Head Screw	N/A	4	N/A	4	N/A	4	N/A	4		
45	Flat Washer	000067x0056	4	000067x0051	4	000067x0051	4	000067x0051	4	000067x0052	4
46	CBC Arm Step Bushing	308380-04	4	308380-05	4	308380-05	4	308380-05	4	308380-06	4
47	Lock Nut	000414x0008	8	000414x0009	8	000414x0009	8	000414x0009	8	000414x0010	8
48	Snap Ring	000190x0103	2	000190x0102	2	000190x0102	2	000190x0102	2	000190x0101	2
49	CBC Arm Backing Plate	-	-	416808-03	2	416808-03	2	416808-03	2	416806-02	2
93	Socket Head Screw	-	-	000433x1001	4	000433x1001	4	000433x1001	4	000433x1202	4
94	Lock Nut	-	-	-	-	-	-	-	-		
-	Loctite® #243, 10 ml	000153x1238	1	000153x1238	1	000153x1238	1	000153x1238	1	000153x1238	1
-	CBC 16100.1 Instruction Sheet	204178	1	204178	1	204178	1	204178	1	204178	1

Item	Description	Model		Model		Model		Model	
		50 CBC 146491BB	Qty	55 CBC 146492BB	Qty	60 CBC 146493BB	Qty	66 CBC 146494BB	Qty
20	Socket Head Screw	000433x1201	4	000433x1201	4	000433x1204	4	000433x1204	4
36	CBC Round Reaction Pin Bushing	416804-06	1	416804-06	1	416804-07	1	416804-07	1
37	CBC Round Reaction Pin	416802-06	1	416802-06	1	416802-07	1	416802-07	1
38	CBC Square Reaction Pin Bushing	416805-06	1	416805-06	1	416805-07	1	416805-07	1
39	Hex Head Screw	000391x0802	4	000391x0802	4	000391x0802	4	000391x0802	4
40	CBC Square Reaction Pin	416803-06	1	416803-06	1	416803-07	1	416803-07	1
41	CBC Retainer Plate	308381-04	2	308381-04	2	308381-04	2	308381-04	2
42	CBC Short Arm Plate	416806-10	2	416806-11	2	416806-12	2	416806-13	2
43	Hex Head Screw	000391x1200	4	000391x1200	4	000391x1208	4	000391x1403	4
44	Hex Head Screw								
45	Flat Washer	000067x0053	4	000067x0053	4	000067x0054	4	000067x0055	4
46	CBC Arm Step Bushing	308380-07	4	308380-08	4	308380-08	4	308380-09	4
47	Lock Nut	000414x0010	8	000414x0010	8	000414x0010	8	000414x0010	8
48	Snap Ring	000190x0100	2	000190x0100	2	000190x0099	2	000190x0099	2
49	CBC Arm Backing Plate	416808-02	2	416808-02	2	416808-01	2	416808-01	2
93	Socket Head Screw	000433x1203	4	000433x1203	4	000433x1205	4	000433x1205	4
94	Lock Nut								
-	Loctite® #243, 10 ml	000153x1238	1	000153x1238	1	000153x1238	1	000153x1238	1
-	CBC 16100.1 Instruction Sheet	204178	1	204178	1	204178	1	204178	1

8.6 Piston Seal Kit

Item	Description	Model		Model		Model		Model		Model	
		25 CBC 146486FF	Qty	30 CBC 146487FF	Qty	35 CBC 146488FF	Qty	40 CBC 146489FF	Qty	45 CBC 146490FF	Qty
9	Piston Seal (ID)	000402x0066	1	000402x0065	1	000402x0064	1	000402x0056	1	000402x0055	1
10	Piston Seal (OD)	000431x0010	1	000431x0009	1	000431x0010	1	000431x0007	1	000431x0006	1
11	Face Seal (outer)	000073x0402	1	000073x0401	1	000073x0400	1	000073x0392	1	000073x0393	1
59	Seal (inner)	000073x0403	1	000073x0297	1	000073x0297	1	000073x0261	1	000073x0391	1
-	Dow Corning 55 O-ring Lube	000153x1239	1	000153x1239	1	000153x1239	1	000153x1239	1	000153x1239	1
Item	Description	Model		Model		Model		Model			
		50 CBC 146491FF	Qty	55 CBC 146492FF	Qty	60 CBC 146493FF	Qty	66 CBC 146494FF	Qty		
9	Piston Seal (ID)	000402x0054	1	000402x0053	1	000402x0052	1	000402x0051	1		
10	Piston Seal (OD)	000431x0005	1	000431x0004	1	000431x0003	1	000431x0002	1		
11	Face Seal (outer)	000073x0395	1	000073x0396	1	000073x0397	1	000073x0398	1		
59	Seal (inner)	000073x0399	1	000073x0394	1	000073x0396	1	000073x0396	1		
-	Dow Corning 55 O-ring Lube	000153x1239	1	000153x1239	1	000153x1239	1	000153x1239	1		

8.7 Strap Kit

Item	Description	Model		Model		Model		Model		Model	
		25 CBC 146486JJ	Qty	30 CBC 146487JJ	Qty	35 CBC 146488JJ	Qty	40 CBC 146489JJ	Qty	45 CBC 146490JJ	Qty
19	CBC Clutch Strap	416810-04	2	416810-03	2	416810-03	2	416810-03	2	416810-02	2
20	Socket Head Screw (low head)	000433x0601	4	000433x0801	4	000433x0801	4	000433x0801	4	000433x1201	4
22	Roll Pin	000382x0052	4	000382x0047	4	000382x0047	4	000382x0047	4	000382x0048	4
Item	Description	Model		Model		Model		Model			
		50 CBC 146491JJ	Qty	55 CBC 1464924JJ	Qty	60 CBC 1464925JJ	Qty	66 CBC 1464926JJ	Qty		
19	CBC Clutch Strap	416810-02	2	416810-02	2	416810-01	2	416810-01	2		
20	Socket Head Screw (low head)	000433x1201	4	000433x1201	4	000433x1204	4	000433x1204	4		
22	Roll Pin	000382x0048	4	000382x0049	4	000382x0050	4	000382x0050	4		

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