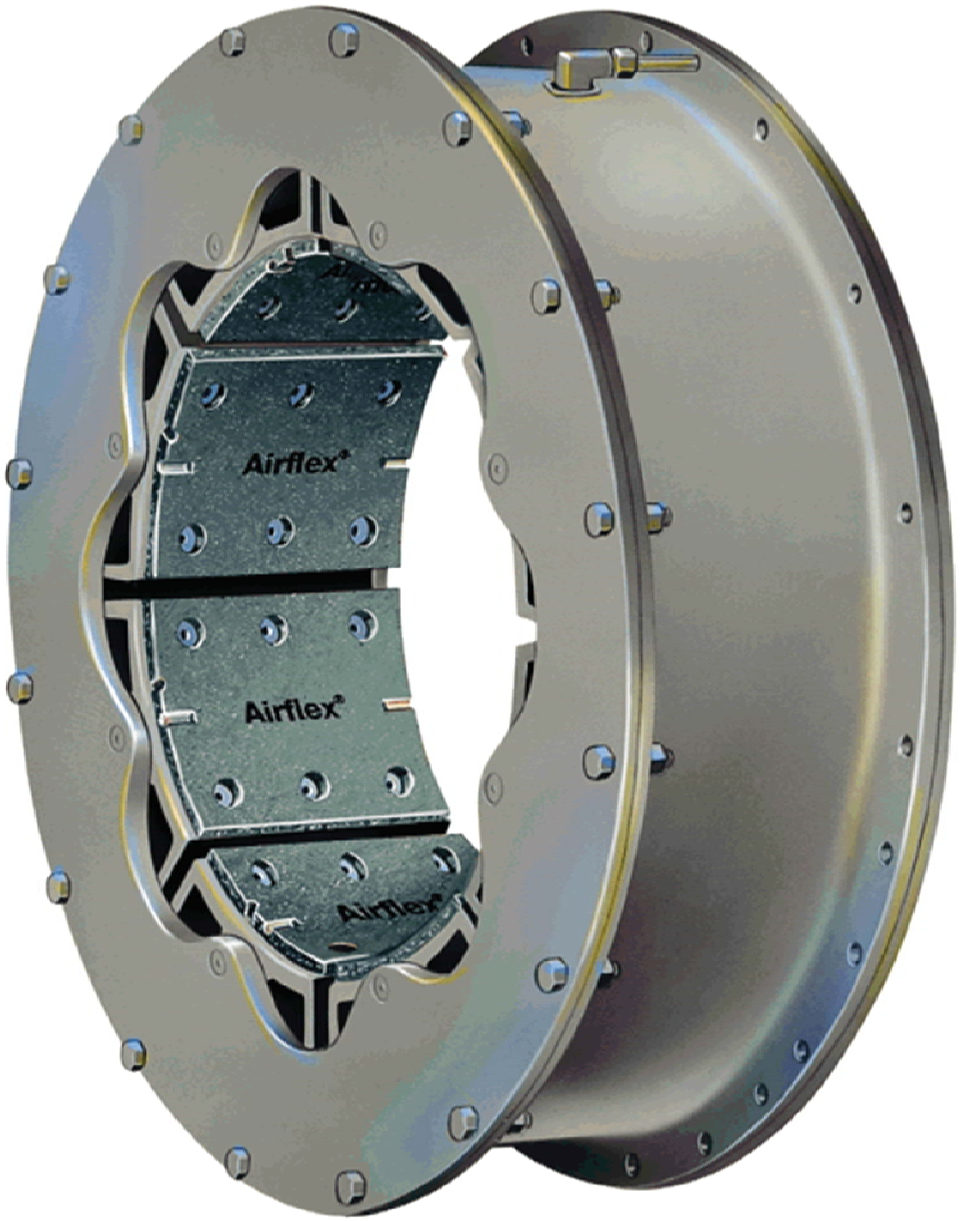
Airflex® VC Element Assemblies

VC 5000

Installation, Operation and Maintenance Manual

203675



Powering Business Worldwide

Table of contents

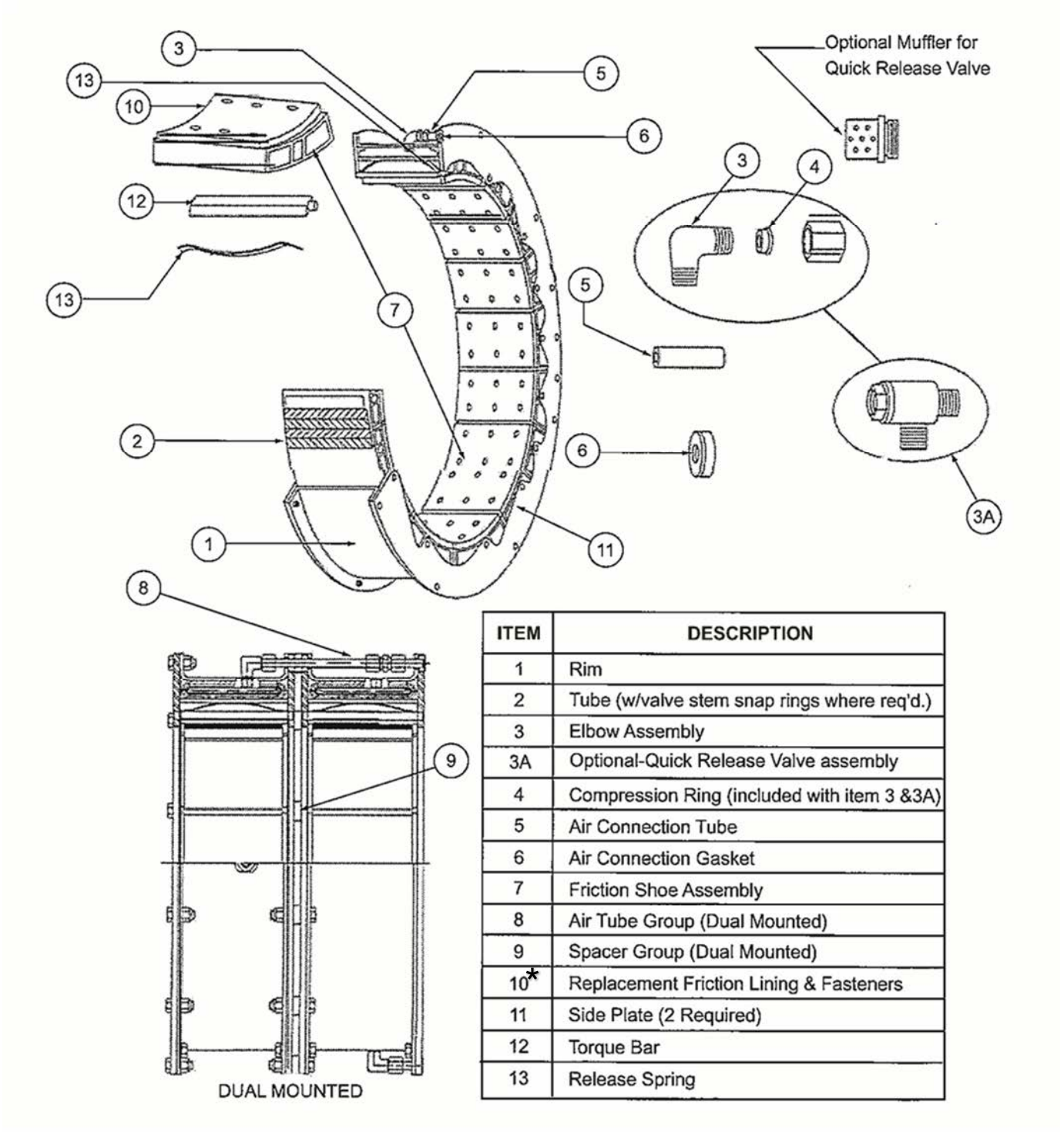
⚠ WARNING

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 and Canada: (216) 281-2211
Internet: www.eaton.com/airflex



ITEM	DESCRIPTION
1	Rim
2	Tube (w/valve stem snap rings where req'd.)
3	Elbow Assembly
3A	Optional-Quick Release Valve assembly
4	Compression Ring (included with item 3 &3A)
5	Air Connection Tube
6	Air Connection Gasket
7	Friction Shoe Assembly
8	Air Tube Group (Dual Mounted)
9	Spacer Group (Dual Mounted)
10*	Replacement Friction Lining & Fasteners
11	Side Plate (2 Required)
12	Torque Bar
13	Release Spring

Figure 1 : Component Parts for Airflex Type VC Element

*Note: Item 10 – see Section 8.1 for part numbers

1.0 INTRODUCTION

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

⚠ DANGER

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

⚠ WARNING

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

⚠ CAUTION

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

It is the responsibility and duty of all personnel involved in the installation, operation, and maintenance of the equipment on which this device is used to fully understand the procedures by which hazards are to be avoided.

⚠ DANGER

⚠ WARNING

⚠ CAUTION

1.1. Description

1.1.1 The Airflex® air-actuated VC element assembly is specifically designed and manufactured for severe clutch or brake applications on heavy equipment where high starting loads or sustained slippage would normally lower clutch or brake efficiency and reduce operating life. Constricting action and ventilated construction make high torque capacity and rapid heat dissipation possible.

1.1.2 All Airflex VC element assemblies are supplied with long wearing, NON-ASBESTOS friction material.

1.1.3 Airflex element assemblies are available for drum diameters from 11.5 inches through 76 inches. The element size designation indicates the nominal drum diameter in inches, the clutch model and the width of the friction material. For example, size "38VC1200" indicates the element operates on a drum having a nominal diameter of 38 inches, is an Airflex "VC" series clutch or brake (the scope of this manual) and has friction material which is 12 inches wide.

1.1.4 Where diameter space is limited, or the torque required is greater than a single element can transmit, all sizes of Airflex VC elements can be supplied as dual units.

1.2. How it Works

1.2.1 Referring to **Figures 1 and 2**, the neoprene and cord actuating tube is contained within a steel rim which is drilled for mounting to the driving component (or reaction bracket in the case of a VC brake application). As air pressure is applied to the air actuating tube, the tube inflates, forcing the friction shoe assemblies uniformly against the drum, which is attached to the driven component. The friction shoe assemblies, which consist of friction blocks attached to aluminum backing plates, are guided by torque bars which are secured to side plates. In the case where the VC element is being used as a clutch and is attached to the driving shaft, the torque flow is from the driving shaft, through the element mounting component (typically an iron spider), through the rim/side plate structure, through the torque bars to the backing plates and friction material, where the torque is transmitted through the friction couple to the components mounted on the driven shaft (clutch drum and drum mounting component). As actuating air is exhausted, release springs and centrifugal force assure positive disengagement.

1.3. Element Adjustment

1.3.1 Airflex VC elements are completely self-adjusting and automatically compensate for lining and drum wear. Lubrication is not required. The torque developed is dependent upon rotating speed and applied air pressure. By limiting the applied pressure, the element will act as a torque limiting device and provide overload protection.

1.3.2 To accomplish regulated or cushioned engagement of the element, a flow control valve may be installed in the element air supply line and adjusted to restrict air flow to the element while allowing free

flow away from the element for rapid disengagement. By adjusting the flow, the rate of engagement may be varied. Note that the flow control valve does not regulate air pressure. The supply pressure must always be adequate to transmit the maximum required torque. Refer to the OPERATION section of this manual for air piping configurations.

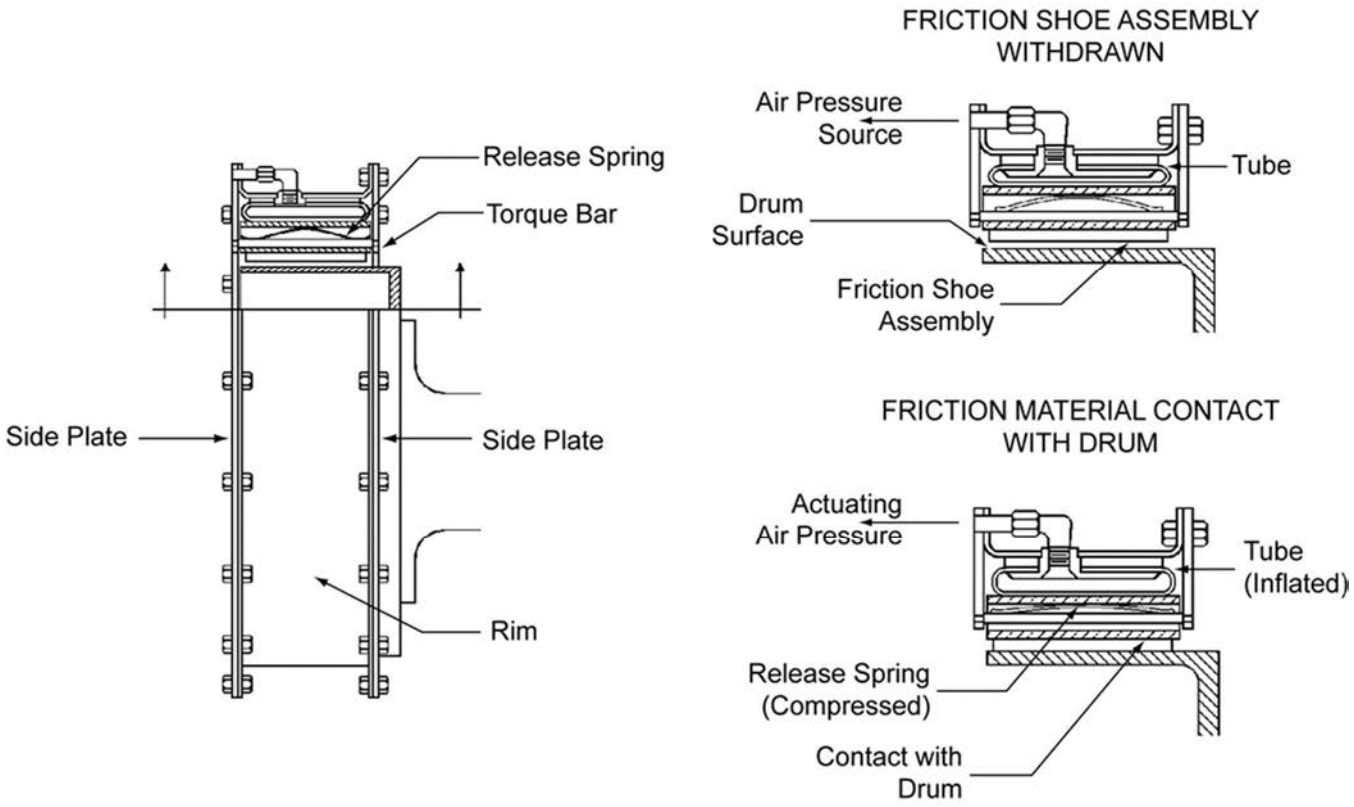


Figure 2

2.0 INSTALLATION

⚠ WARNING

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

⚠ CAUTION

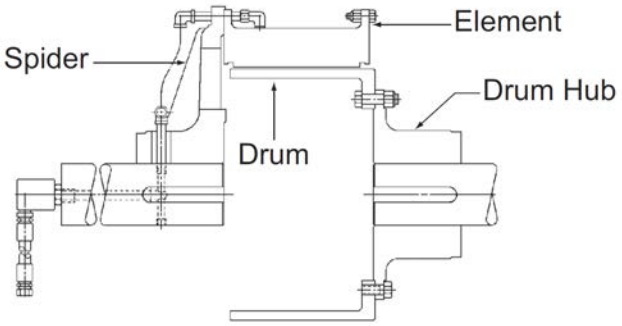
Do not inflate the element without having a drum in place. Inflation of the element without a drum in place will result in permanent damage to the element components.

2.1 Mounting Arrangements

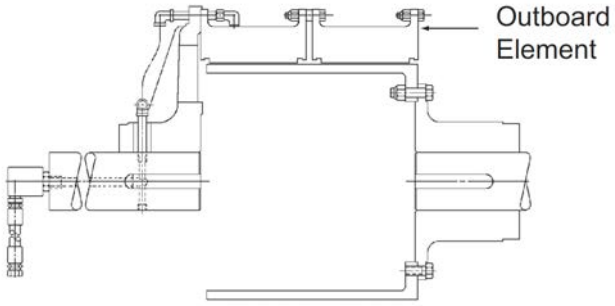
2.1.1 **Figure 3** illustrates the gap-mounting arrangement. In this arrangement, the element is attached to a spider which is typically mounted on the driving shaft. The drum is attached to a drum hub which is typically mounted on the driven shaft. The gap between the two shafts allows the element and drum to be removed without disturbing either shaft.

Note: The text in the Installation, Alignment and Removal sections refer to this type of mounting arrangement.

SINGLE NARROW & SINGLE WIDE



DUAL NARROW



DUAL WIDE

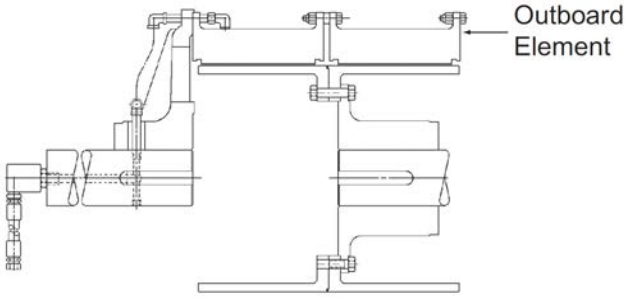


Figure 3

2.1.2 **Figure 4** illustrates the gap-mounting arrangement with an axial locking device. The axial locking device restricts the relative axial motion between the driving and driven shafts. This arrangement is typically used where a synchronous motor armature with plain bearings must be held on magnetic center.

2.1.3 **Figure 5** illustrates a typical VC brake application. The drum and drum hub are attached to the shaft which is to be stopped. The element is attached to a rigid reaction bracket.

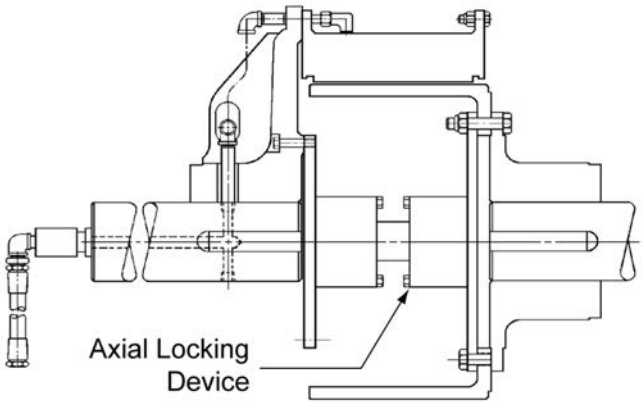


Figure 4

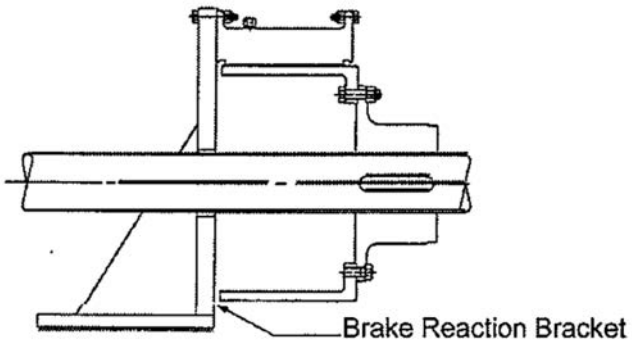


Figure 5

2.1.4 **Figure 6** illustrates a typical marine main propulsion application. In this arrangement, the element is attached to a pinion adapter plate and the drum and drum hub are attached to a quill shaft. A manifold is attached to the outboard end of the element for bearing support of the quill shaft.

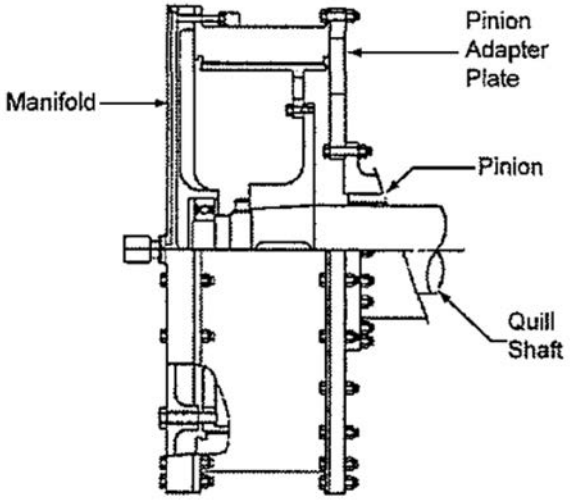


Figure 6

2.1.5 **Figure 7** illustrates a typical marine main propulsion application where the clutch is mounted between the engine and reduction gear. In this arrangement, the VC clutch is combined with a Geislinger® flexible torsional coupling.

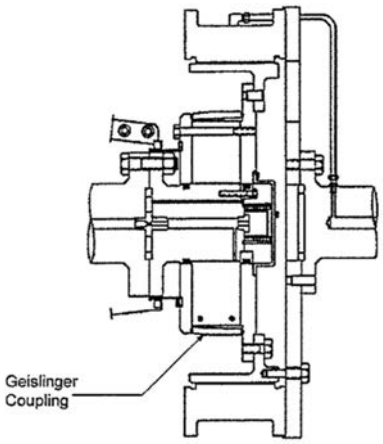


Figure 7

2.1.6 **Figure 8** illustrates a VC clutch mounting for punch press applications. The drum and drum hub are attached to the crankshaft or backshaft and the element is attached to a bearing-supported flywheel or bullgear. VC clutches on punch presses are typically used in combination with Airflex type CTE and DBA brakes.

2.1.7 Airflex can provide specific drawings covering the different mounting arrangements mentioned. The maintenance of the element assembly, tolerances and wear limits of friction material, and alignment specifications in this manual apply to all VC applications.

2.2 Mounting Considerations

2.2.1 For clutch and brake applications, shaft alignment must be within the tolerances indicated in the Alignment section of this manual.

⚠ CAUTION

Operation with shaft misalignment exceeding the limits indicated in the Alignment section of this manual will result in accelerated wear of the element components. Severe misalignment will result in excessive vibration and/or overheating when disengaged due to dragging of the friction shoes.

2.2.2 The element must be protected from contamination from oil, grease or excessive amounts of dust.

⚠ CAUTION

Oil or grease contamination will result in a reduction of developed clutch or brake torque. Excessive dust contamination may result in incomplete disengagement. Either of these conditions will result in clutch or brake slippage and overheating.

⚠ CAUTION

All rotating equipment must be guarded to comply with applicable safety standards.

2.2.3 All mounting fasteners must be of the proper size and grade and torqued to the appropriate value. See Table 1.

⚠ WARNING

Use only the proper grade and number of mounting fasteners. Using commercial grade fasteners (Grade 2) in place of Grade 8 fasteners (where called for) may result in failure under load, causing personal injury or equipment damage.

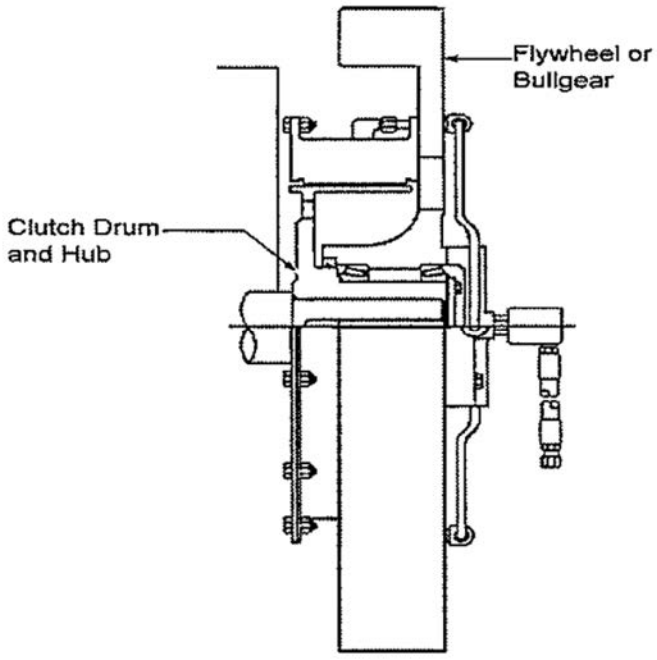


Figure 8

TABLE 1 FASTENER ASSEMBLY TORQUE				
SN = SINGLE NARROW				
SW = SINGLE WIDE				
DN = DUAL NARROW				
DW = DUAL WIDE				
L = LUBED TORQUE - FT.LB. (Nm) (30 WT. MOTOR OIL OR ANTI-SEIZE)				
D = DRY TORQUE - FT.LB. (Nm)				
SIZE	**ELEMENT TO SPIDER/SIDE PLATE TO RIM**	**TORQUE**	**DRUM TO HUB**	**TORQUE**
SN11.5VC500	3/8-16NC GR 2	D 15 (20)	1/2-13NC GR 2	D 38 (51)
SN14VC500	1/2-13NC GR 2	D 38 (51)	3/4-10NC GR 2	L 93 (126)
SN16VC600				
SN20VC600				
SN24VC650	5/8-11NC GR 2	D 77 (104)		
SN28VC650				
SN33VC650	3/4-10NC GR 2	L 93 (126)		
SN37VC650				
SN42VC650				
DN11.5VC500	3/8-16NC GR 2	D 15 (20)	1/2-13NC GR 8	D 109 (148)
DN14VC500	1/2-13NC GR 8	D 87 (118)	1/2-13NC GR 2	D 38 (51)
DN16VC600	1/2-13NC GR 2	D 38 (51)	3/4-10NC GR 8	L 245 (332)
DN20VC600	1/2-13NC GR 8	D 87 (118)		L 211 (286)
DN24VC650	5/8-11NC GR 2	D 77 (104)	3/4-10NC GR 2	L 93 (126)
DN28VC650				
DN33VC650	3/4-10NC GR 2	L 93 (126)		
DN37VC650				
DN42VC650				
SW14VC1000	1/2-13NC GR 2	D 38 (51)	1/2- 13NC GR 8	L 109 (148)
SW16VC1000			3/4-10NC GR 2	L 93 (126)
SW20VC1000				
SW24VC1000	5/8-11NC GR 2	D 77 (104)		
SW28VC1000				
SW32VC1000				
SW38VC1200	3/4-10NC GR 2	L 93 (126)		
SW42VC1200				
SW46VC1200	7/8-9NC GR 2	L 109 (148)	1-8NC GR 2	L 163 (221)
SW52VC1200				
SW51VC1600				
SW60VC1600	1-8NC GR 2	L 163 (221)	1 1/2-6NC GR 2	L 566 (767)
SW66VC1600	1 1/4-7NC GR 2	L 325 (441)		
DW16VC1000	1/2-13NC GR 8	D 87 (118)	3/4-10NC GR 8	L 245 (332)
DW20VC1000				
DW24VC1000	5/8- 11NC GR 8	D 174 (236)		
DW28VC1000				
DW32VC1000				
DW38VC1200	3/4-10NC GR 8	L 245 (332)		
DW42VC1200				
DW46VC1200	7/8-9NC GR 2	L 109 (148)	1-8NC GR 8	L 510 (692)
DW52VC1200				
DW51VC1600				
DW60VC1600	1-8NC GR 2	L 190 (258)	1 1/2-6NC GR 2	L 650 (881)
DW66VC1600	1 1/4-7NC GR 2	L 380 (515)		
DW76VC1600				
DW76VC2000				

HEX SIZES (in.)								
SIZE	**BOLT**	**NUT**	**SIZE**	**BOLT**	**NUT**	**SIZE**	**BOLT**	**NUT**
3/8NC	9/16	9/16	3/4NC	1-1/8	1-1/16	1-1/4NC	1-7/8	1-13/16
1/2NC	3/4	3/4	7/8NC	1-5/16	1-1/4	1-1/2NC	2-1/4	2-3/16
5/8NC	15/16	15/16	1NC	1-1/2	1-7/16			

2.3 Mounting Spider and Drum Hub

2.3.1 The spider and drum hub are bored for a press fit onto their respective shafts. The interference is approximately 0.0005 inch per inch (0.0005 mm/mm) of shaft diameter.

2.3.1.1 Ensure the shaft is clean and free of nicks or burrs and check the shaft and bore diameters for proper fit.

2.3.1.2 Tap the key into the keyway, making sure it bottoms.

2.3.1.3 Apply a light coat of anti-seizing compound to the shaft and key.

2.3.1.4 Heat the drum hub or spider uniformly to 250°F **(121°C)** to expand the bore.

⚠ CAUTION

It is recommended the drum hub or spider be heated in oil or an oven; however, since this is not always possible, torches may be used. When using torches, use several with "rosebud" (broad-flame) tips and keep them moving to avoid "hot spots". Check bore temperature frequently to avoid overheating.

2.3.1.5 Slide the heated drum hub or spider onto the shaft until the hub face is flush with the end of the shaft. Hold in position and allow to cool.

2.4 Shaft Alignment

Note: The text in this section applies to gap mounted applications; however, the alignment tolerances apply to all types of mountings.

Parallel Alignment Tolerance (Offset):

Not to exceed 0.010 inch (0.254 mm) Total Indicator Reading (0.005 inch (0.127 mm) maximum offset).

Angular Alignment Tolerance (Gap):

Not to exceed 0.0005 inch per inch (0.0005 mm/mm) diameter at which readings are taken ("D" on Figure 9).

Note: The alignment procedure described below has been used successfully on many VC clutch and brake applications. Other procedures, of course, may be used; however, the alignment tolerances are the same regardless of the technique used.

TABLE 2
"X" DIMENSIONS (FIG 9)

SIZE	"X" Inch (mm)	SIZE	"X" Inch (mm)	SIZE	"X" Inch (mm)	SIZE	"X" Inch (mm)
SN11.5VC500	6.750 (171.5)	DN11.5VC500	13.375 (339.7)	SW14VC1000	11.875 (301.6)		
SN14VC500	6.812 (173.0)	DN14VC500	13.438 (341.3)	SW16VC1000		DW16VC1000	12.750 (323.9)
SN16VC600	8.062 (204.8)	DN16VC600	15.938 (404.8)	SW20VC1000		DW20VC1000	
SN20VC600		DN20VC600		SW24VC1000		DW24VC1000	
SN24VC650	8.562 (217.5)	DN24VC650	16.688 (423.9)	SW28VC1000		DW28VC1000	
SN28VC650		DN28VC650		SW32VC1000	11.938 (303.2)	DW32VC1000	12.812 (325.4)
SN33VC650		DN33VC650	16.750 (425.5)	SW38VC1200	14.125 (356.7)	DW38VC1200	15.000 (381.0)
SN37VC650		DN37VC650		SW42VC1200		DW42VC1200	15.125 (384.2)
SN42VC650		DN42VC650		SW46VC1200		DW46VC1200	15.250 (387.4)
				SW52VC1200	14.625 (371.5)	DW52VC1200	15.750 (400.0)
				SW51VC1600	18.875 (479.4)	DW51VC1600	20.000 (508.0)
				SW60VC1600	18.750 (476.3)	DW60VC1600	20.375 (517.5)
				SW66VC1600	20.500 (520.7)	DW66VC1600	22.000 (558.8)
				SW76VC1600	Contact Factory	DW76VC1600	20.375 (517.5)
				SW76VC2000		DW76VC2000	24.374 (619.1)

2.4.1 Foundations must be set so distance ‘X”, shown on **Figure 9**, is established. If the clutch is mounted on a shaft having plain bearings, make sure the shaft is centered within the bearings when establishing the “X” dimension. Refer to Table 2 for appropriate “X” dimensions.

Note : It is presumed that one of the shafts has been properly located and anchored.

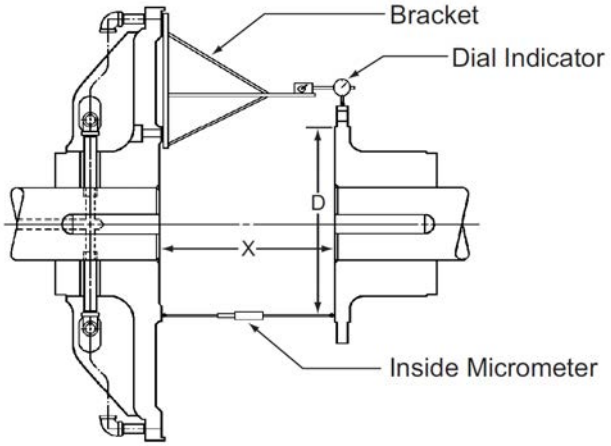


Figure 9

2.4.2 Fabricate a rigid bracket for supporting a dial indicator and attach to the spider. See **Figure 9**.

2.4.3 Thoroughly clean the flange O.D. and the face of the drum hub where alignment readings are to be taken.

2.4.4 Rotate the spider and take parallel alignment readings off the drum hub flange O.D. If both shafts can be rotated together, the alignment readings are less influenced by any surface irregularities.

⚠ CAUTION

When recording parallel alignment readings, “sag” of the indicator/indicator bracket must be accounted for.

2.4.5 Angular alignment readings can be made by accurately measuring the gap between the spider and drum hub faces with an inside micrometer. If a dial indicator is used, make sure to monitor and correct for any axial movement of the shaft. To reduce the influence any surface irregularities may have on the angular alignment readings, index the spider 90 degrees after taking the initial set of readings. Take an additional set of readings and index the spider another 90 degrees. Continue in this manner until four sets of readings have been taken. For misalignment correction, use the average of the four readings at each position. In other words, average the four top readings, the four bottom readings, and each of the four side readings.

2.4.6 Shim and shift the base of the movable shaft to correct the misalignment. After tightening the base, recheck the alignment and correct if necessary. Make sure to check for a “soft foot” condition. Dowel or chock into position after satisfactory alignment has been achieved.

Note : On many applications, thermal growth of the driving or driven machinery may result in unacceptable shaft alignment in a running condition. It is always a good practice to make a “hot alignment” check and the shim if necessary.

2.5 Installation of Element and Drum (Narrow, Dual Narrow and Single Wide)

2.5.1 Note the orientation of the drum flange with respect to the air connection(s) on the element and slide the drum into the element.

2.5.2 Separate the shafts as far as the bearing clearances will allow and hoist the element/drum into position.

2.5.3 Attach the drum to the drum hub with the appropriate fasteners. See Table 1. Make sure the bore in the drum flange fully engages the pilot on the drum hub.

⚠ WARNING

Use only the proper grade and number of fasteners. Using commercial grade fasteners (Grade 2) in place of Grade 8 fasteners (where called for) may result in failure of the fasteners under load, causing personal injury or equipment damage.

2.5.4 Install the air connection gaskets onto the air tubes. The metal backup washer is to be positioned towards the elbow (away from the spider). See **Figure 10**.

Note: Some older elements use a flanged air connection tube and a thin gasket. See Table 3 for correct part numbers.

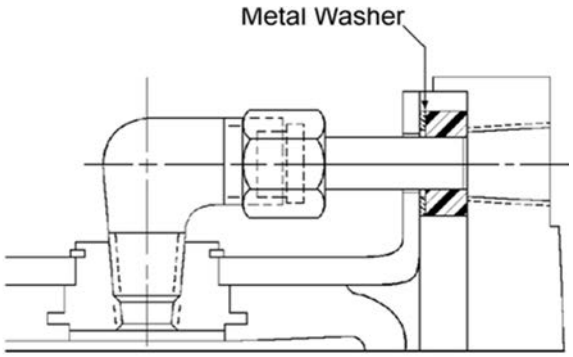


Figure 10

2.5.5 Align the element air connections with the passages in the spider and attach the element to the spider with the appropriate fasteners. See Table 3. Make sure the element fully engages the register in the spider.

⚠ WARNING

Use only the proper grade and number of fasteners. Using commercial grade fasteners (Grade 2) in place of Grade 8 fasteners may result in failure of the fasteners under load, causing personal injury or equipment damage.

TABLE 3
AIR CONNECTIONS FOR VC ELEMENTS

	OLD METHOD (FLANGED TUBE)		CURRENT METHOD (STRAIGHT METHOD)	
SIZE	**AIR TUBE**	**WASHER**	**AIR TUBE**	**WASHER**
11.5VC500	201402	72 x 15	412178-02	412324-01
14VC500	201302	72 x 11	412178-03	412324-02
16VC600				
20VC600				
24VC650	201286	72 x 12	412178-05	412324-03
28VC650				
33VC650	201284	72 x 13	412178-06	412324-04
37VC650			412178-08	
42VC650			412178-06	
14VC1000	201302	72 x 11	412178-03	412324-02
16VC1000	202408			
20VC1000	201302			
24VC1000	201286	72 x 12	412178-05	412324-03
32VC1000				
38VC1200	201284	72 x 13	412178-06	412324-04
42VC1200				
46VC1200	202081		412178-07	
52VC1200	202751	72 x 14	412178-08	412324-05
51VC1600	304213		412178-09	
60VC1600			412178-18	412324-06
66VC1600			412178-04	
76VC1600				
76VC2000				

2.6 Installation of Element and Drums (Dual Wide)

2.6.1 Separate the shafts as far as the bearing clearances will allow.

2.6.2 Attach the drum having the female register on the drum flange to the drum hub with short screws and lockwashers. There are tapped holes in the drum flange to accept the screws. Make sure the bore in the drum flange fully engages the pilot on the drum hub. See **Figure 3.**

2.6.3 Disassemble the dual element into two halves and, noting the orientation of the air connections, place the element onto the drum installed in 2.6.2.

2.6.4 Noting the orientation of the flange on the remaining drum with respect to the air connections on the remaining element, slide the drum into the element.

2.6.5 Hoist the element/drum into position, align the tapped holes in the drum having the male pilot with the tapped holes in the drum attached to the drum hub, and attach both drums to the drum hub with the appropriate fasteners. See Table 1. Make sure the male pilot fully engages the female register.

⚠ WARNING

Use only the proper grade and number of fasteners. Using commercial grade fasteners (Grade 2) in place of Grade 8 fasteners (where called for) may result in failure of the fasteners under load, causing personal injury or equipment damage.

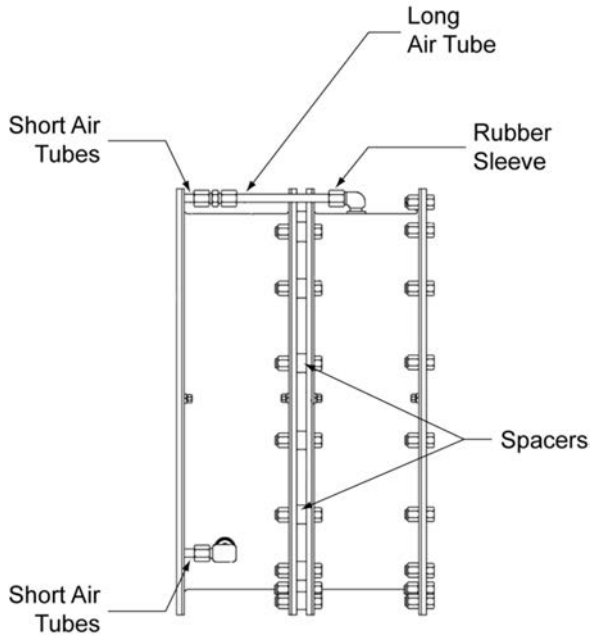


Figure 11

2.6.6 Align the air connections and reassemble the element halves, making sure the spacers are in place between the elements. See **Figure 11**.

2.6.7 Reassemble the air connection tubes. If an elbow has been removed, use a good quality pipe sealant on the threads. See **Figure 11**.

Note: The elbow assemblies on the outboard element (farthest from the spider) use rubber compression sleeves. Make sure the sleeves are secure on the long air tubes.

2.6.8 Install the air connection gaskets onto the air tubes. The metal backup washer is to be positioned towards the elbow (away from the spider). See **Figure 10**.

2.6.9 Align the element air connections with the corresponding passages in the spider and attach the element to the spider with the appropriate fasteners. See Table 1. Make sure the element fully engages the register in the spider.

⚠ WARNING

Use only the proper grade and number of fasteners. Using commercial grade fasteners (Grade 2) in place of Grade 8 fasteners may result in failure of the fasteners under load, causing personal injury or equipment damage.

2.7 Air Control System

2.7.1 A typical air control system is shown on **Figure 12**. Since the air control system used will be dependent on the specific application, a detailed description cannot be made in this manual. Following are some general guidelines for installing and adjusting air controls.

2.7.1.1 The air receiver tank must be located as close to the rotorseal as possible for consistent clutch or brake response.

2.7.1.2 Use full size piping and valves consistent with the rotorseal size.

2.7.1.3 Keep the number of elbows to a minimum.

2.7.1.4 Use poppet-type solenoid valves. Spool valves are not recommended.

2.7.1.5 An air line lubricator is not required for the element; however, if one is used, it must be a non-adjustable, mist-type.

2.7.1.6 If a flow control valve is used, it must have free flow (indicated by an arrow on the valve body) directed away from the element.

2.7.1.7 The final connection to the rotorseal MUST be made with flexible hose and place no radial load upon the rotorseal.

⚠ CAUTION

Do not use rigid pipe at the connection to the rotorseal. Rigid piping will result in excessive loads on the rotorseal bearings, shortening life.

⚠ CAUTION

Maximum applied air pressure is 125 psig (8.5 bar). Operation at pressures exceeding 125 psig may result in damage to the element. Consult the factory if operation at pressures greater than 125 psig is desired.

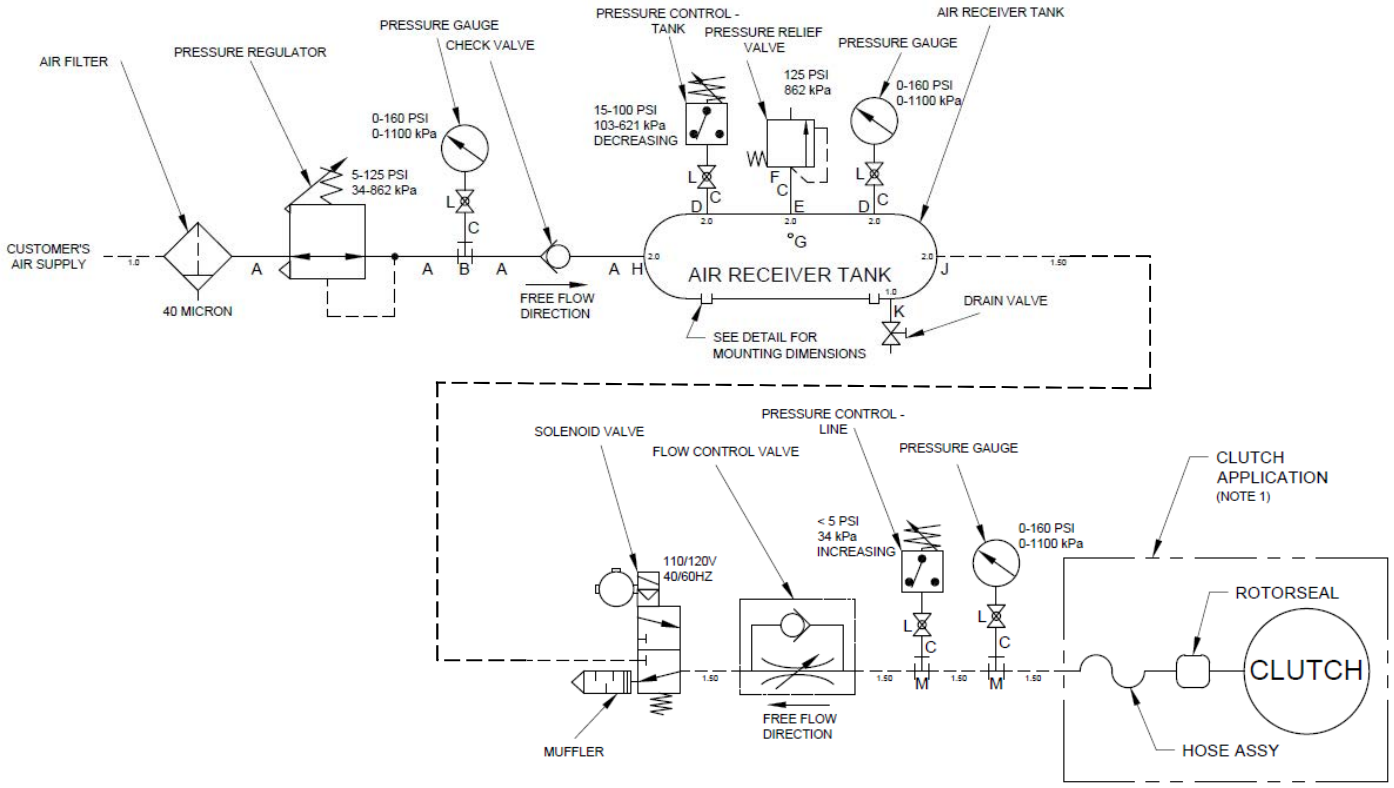


Figure 12

TABLE 4
MAXIMUM SAFE OPERATING SPEEDS

Size (Narrow)	Maximum RPM	Size (Narrow)	Maximum RPM	Size (Wide)	Maximum RPM	Size (Wide)	Maximum RPM
11.5VC500	1800	28VC650	1000	14VC1000	1800	42VC1200	670
14VC500	1500	33VC650	900	16VC1000	1400	46VC1200	600
16VC600	1400	35VC650		20VC1000	1300	52VC1200	550
20VC600	1200	37VC650	800	24VC1000	1250	51VC1600	
24VC650	1050	42VC650		28VC1000	1100	60VC1600	520
				32VC1000	1050	66VC1600	480
				38VC1200	740	76VC1600	275
						76VC2000	

3.0 OPERATION

⚠ WARNING

Exceeding the operating limits described in this section may result in personal injury or equipment damage.

3.1 Torque, RPM and Pressure Limits

3.1.1 The developed torque is directly proportional to the applied air pressure. If the developed torque seems inadequate, check for oil, grease or dust contamination.

⚠ CAUTION

Maximum applied air pressure is 125 psig (8.5bar). Operation at pressures exceeding 125 psig may result in damage to the element. Consult the factory if operation at pressures greater than 125 psig is desired.

⚠ CAUTION

The non-asbestos friction material used in Airflex VC units may not develop rated torque initially, as a short "Wear-in" period is required. It is very important that clutch or brake operation be monitored closely to prevent excessive heat generation from slippage.

3.1.2 Maximum safe operating speeds are shown on Table 4.

⚠ DANGER

Do not exceed the operating speeds shown on Table 4. Operation at speeds greater than allowable will result in permanent damage to the clutch element, personal injury or death.

4.0. MAINTENANCE

⚠ WARNING

Only qualified personnel should maintain and repair these units. Faulty workmanship may result in personal injury or equipment damage.

⚠ CAUTION

When replacing clutch or brake components, use only genuine, Airflex replacement parts.

4.1 Periodic Inspection

4.1.1 The following items may be inspected without disassembly of the element:

4.1.1.1 **Friction Shoe Assembly Lining Wear** - Check the lining thickness and compare to the values shown on Table 5. If the linings have worn to minimum allowable thickness or less, they must be replaced as a complete set.

⚠ CAUTION

Operation with friction material worn to less than minimum allowable thickness will result in damage to the drum.

Note: A wear indicating groove (see Figure 13) is provided on each end of the friction block. The maximum wear point, which coincides with the values shown on Table 5, is at the bottom of the groove.

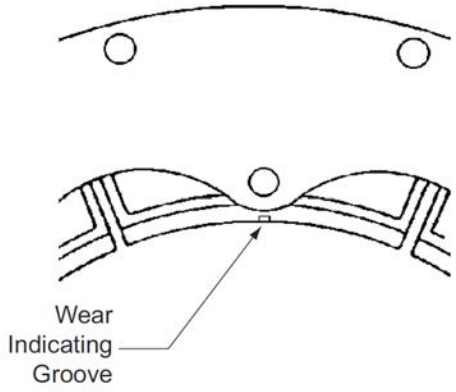


Figure 13

TABLE 5
FRICTION MATERIAL THICKNESS

Element Size	Minimum Allowable Lining Thickness, inch (mm)	Original Lining Thickness, inch (mm)
NARROW SERIES		
11.5VC500 thru 20VC600	0.15 (3.8)	0.33 (8.4)
24VC650 thru 28VC650		0.45 (11.4)
33VC650 thru 42VC650	0.28 (7.1)	0.58 (14.7)
WIDE SERIES		
12VC1000 thru 20VC1000	0.15 (3.8)	0.33 (8.4)
24VC1000 thru 28VC1000		0.45 (11.4)
32VC1000 thru 42VC1200	0.38 (9.5)	0.58 (14.7)
32VC1000 thru 42VC1200		0.69 (17.5)
51VC1600 thru 76VC2000	0.30 (7.6)	0.67 (17.0)

4.1.1.2 **Contamination of Shoes or Drum** - Oil or grease contamination will reduce the developed torque of the clutch or brake. Disassembly will be required to clean any oil or grease buildup. In extremely dusty environments, dust may accumulate in the backing plate cavities to the point where the friction shoes will not properly retract. Dust accumulations may be vacuumed out of the cavities.

⚠ CAUTION

Do not attempt to use a solvent to remove oil or grease without first removing the element. While squirting a solvent into an installed clutch or brake may improve performance temporarily, a fire hazard exists from the heat generated during slippage.

⚠ CAUTION

Do not use compressed air to blow dust accumulations out of the backing plates. Although the friction material does not contain asbestos, the dust created as the friction material wears, along with the dust from the operating environment, may irritate the respiratory system.

4.1.1.3 **Air Control Components** - Check for proper adjustment of the air control components. Make sure the safety pressure switches, if used are set correctly. Repair any air leaks as discovered.

4.1.2 Partial or complete disassembly is required to inspect the following items:

4.1.2.1 **Drum Diameter Wear** - Check the O.D. of the drum and compare to the values shown on Table 6. Minor heat-checking may be removed by machining the drum O.D. If the drum has been subjected to excessive heat, the open end may flare out, giving the impression that the drum has not worn. It is therefore important to check the diameter at several locations across the face.

TABLE 6
DRUM WEAR LIMITS

NARROW SERIES	
Element Size	**Minimum Allowable Wear on Drum Diameter* inch (mm)**
11.5VC500 thru 16VC600	0.09 (2)
20VC600 thru 24VC650	
28VC650	0.19 (5)
33VC656 thru 42VC650	
WIDE SERIES	
12VC1000 thru 16VC1000	0.09 (2)
20VC1000 thru 24VC1000	0.13 (3)
28VC1000	0.19 (5)
32VC1000 thru 38VC1200	
42VC1200 thru 46VC1200	0.25 (6)
52VC1200 thru 76VC2000	
***Note**: The number preceding the letters 'VC" in the element size designates the original drum diameter in inches.	

Example: 16VC600 - Original Drum Diameter = 16.00 inches (406 mm).

Minimum allowable drum diameter is:

16 inch (406 mm) - 0.09 inch (2 mm) = 15.91inch (404 mm).

⚠ CAUTION

Operation of the clutch or brake on a drum that has worn or has been machined to less that minimum allowable diameter will result in damage to the element components.

4.1.2.2 **Air Actuating Tube** - Check that the tube has not been damaged by excessive heat. If any portion of the tube is hard or charred, the tube must be replaced. Check for any blisters, which would indicate ply separation. A tube in this condition must also be replaced.

4.1.2.3 **Friction Shoe Lining Wear** - If the linings are glazed, they may be lightly sanded to remove the glazing PROVIDING THEY DO NOT CONTAIN ASBESTOS.

⚠ WARNING

Clean the edge of the lining and note the presence of a blue stripe and a white stripe along with brass flakes in the friction material. If the above exists, the linings contain asbestos. Using the appropriate precautions for working with asbestos, remove the linings and dispose of properly. DO NOT ATTEMPT TO SAND FRICTION MATERIAL CONTAINING ASBESTOS.

⚠ CAUTION

When working with any friction material, regardless of whether or not it contains asbestos, always wear approved safety equipment.

4.1.2.4 **Uneven Friction Lining Wear** - Tapered wear across the friction surface typically indicates a worn drum and/or misalignment. If two or more adjacent shoes are worn on one end only, the air actuating tube has most likely developed a ply separation at that location.

4.1.2.5 **Backing Plate Wear** - Wear on the ends of the backing plates from bearing against the side plates is indicative of misalignment or thrusting. If wear is on one end only, and uniform for all backing plates, a worn drum may be causing the shoes to thrust as the element engages. If wear exists on both ends of all of the backing plates, excessive misalignment is probably the cause. Slight notching in the torque bar cavity is normal; however, if the notching occurs in a short amount of time, check shaft alignment. If both walls in the torque bar cavity are notched, there may be a significant vibration (torsional) problem.

4.1.2.6 **Release Springs and Torque Bars** - Excessive wear at the ends of the torque bars where the release spring rides indicates excessive parallel misalignment.

4.1.2.7 **Side Plates** - Any wear on the backing plates will also be reflected as elongation of the torque bar holes in the side plates.

4.1.2.8 **Contamination of Friction Shoes** - Mild oil or grease contamination may be removed with a solvent. Linings which have become saturated must be replaced. Also, linings that have been charred from excessive heat must be replaced.

⚠ CAUTION

When using any solvent, always follow the appropriate safety precautions.

4.1.2.9 **Excessive Dust Accumulation** - If dust becomes packed in the backing plate cavities, a pressurized enclosure should be considered. Excessive accumulations will prevent complete shoe retraction.

4.2 Removal of Element Assembly and Drum (Narrow, Dual Narrow and Single Wide)

⚠ WARNING

Prior to removal of the clutch or brake, make sure the machinery is in, and will remain in a safe condition.

4.2.1 Match mark the element to the spider and the drum to the drum hub.

4.2.2 Disconnect the element from the spider and allow it to rest on the drum.

4.2.3 Connect an overhead support to the element and apply enough tension to support the weight of the element and drum.

4.2.4 Remove the fasteners attaching the drum to the drum hub and hoist the element/drum out from between the shafts.

⚠ CAUTION

Use extreme care when disconnecting the drum from the hub. Shear points exist at the mounting holes.

4.3 Removal of Element Assemblies and Drums (Dual Wide)

4.3.1 Match mark the element assemblies to each other and to the spider. Also, match mark the drums to each other and to the drum hub.

4.3.2 Disconnect the dual element from the spider and allow it to rest on the drums. Remove the air connection tubes.

4.3.3 Remove the fasteners and spacers attaching the element halves together.

4.3.4 Attach an overhead support to the spider-side element and apply enough tension to support the weight of the element half and one of the drums.

4.3.5 Remove the through bolts and nuts attaching the drums to the drum hub. DO NOT REMOVE THE SHORT SCREWS AND LOCKWASHERS WHICH HOLD THE FEMALE DRUM ONTO THE DRUM HUB. Carefully hoist the spider side element and drum out from between the shafts.

4.3.6 Attach an overhead support to the remaining element and apply enough tension to support the weight of the element and drum.

4.3.7 Remove the short screws and lockwashers holding the drum onto the drum hub and carefully hoist the element and drum out from between the shafts.

⚠ CAUTION

Use extreme care when disconnecting the drums from the drum hub. Shear points exist at the mounting holes.

4.4 Removal of Spider and Drum Hub

4.4.1 Puller holes are provided for removal. It will usually require heating along with the puller. When heating, heat uniformly to prevent hot spots.

4.5 Disassembly of the Element

4.5.1 Lay the element flat on a clean work surface.

4.5.2 Remove the side plate and clean for reassembly. If the torque bar holes are elongated more than one-half the diameter of the pin on the end of the torque bar, the side plate must be replaced.

Snap Ring and Counterbore Eliminated

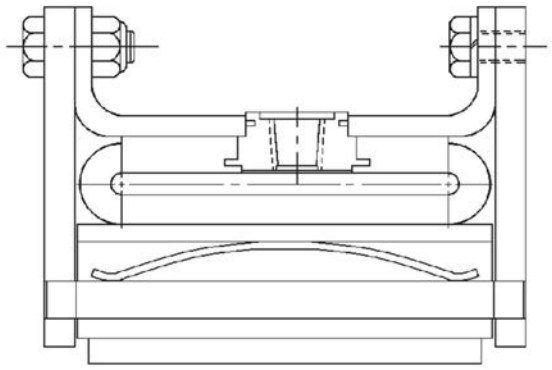


Figure 14a

11.5VC500	**24VC650**	**42VC650**	**24VC1000**
14VC500	28VC650	14VC1000	28VC1000
16VC600	33VC650	16VC1000	32VC1000
20VC600	37VC650	20VC1000	

Counterbore Eliminated and Second Snap Ring Groove Added

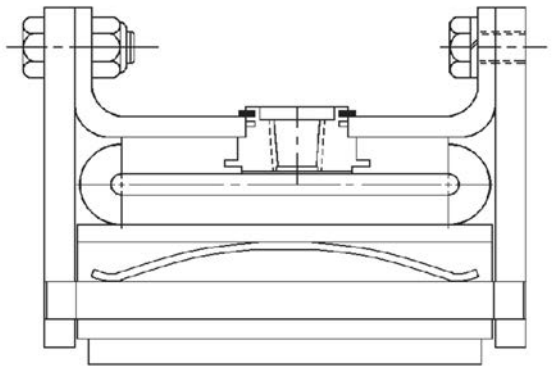


Figure 15b

38VC1200	**46VC1200**	**51VC1600**
42VC1200	52VC1200	60VC1600
		66VC1600

4.5.3 Remove the friction shoe assemblies, torque bars and release springs. If the torque bars and springs come out of the element with the friction shoe assemblies, carefully tap them out of the backing plate cavities. Note wear and replace as necessary.

4.5.4 Remove the air connection elbows and spiral snap rings which secure the air actuating tube to the rim. Smaller size elements do not use snap rings. Carefully remove the air actuating tube from the rim and thoroughly inspect. Replace if necessary.

Note: The snap rings may no longer be required on certain size elements. Also, rims manufactured before 1984 were counterbored at the tube valve hole to accept the snap ring. This counterbore has been eliminated, and a second snap ring groove has been added to the tube valve. See **Figure 14**.

4.5.5 Remove the remaining side plate only if it is to be replaced.

⚠ CAUTION

Whenever the element is removed and disassembled, it is always good practice to replace the release springs.

4.6 Friction Lining Replacement

⚠ CAUTION

Use only genuine Airflex replacement parts.

4.6.1 Make sure the torque bars and release springs have been removed from the backing plates.

4.6.2 For riveted friction shoe assemblies, drill the rivets with a **15/64** inch (6 mm) drill and tap the rivet body out. Larger elements have linings attached with flat head screws and locknuts. Airflex special wrench p/n **304572** will aid in holding the locknuts during removal. See Table 7.

TABLE 7
FRICTION SHOE ASSEMBLY FASTENERS

DRIVE PIN RIVETS			
11.5VC500	24VC650	42VC650	24VC1000
14VC500	28VC650	14VC1000	28VC1000
16VC600	33VC650	16VC1000	
20VC600	37VC650	20VC1000	
FLAT HEAD SCREWS* (BRASS) AND LOCKNUTS			
32VC1000	46VC1200	60VC1600	76VC2000
38VC1200	52VC1200	66VC1600	
42VC1200	51VC1600	76VC1600	

* Screws are 3/8-16NC2 X 1.25 long flat head and should be tightened to 12 ft-lbs. (dry)

4.6.3 Attach the new lining to the backing plate with new screws and locknuts or drive pin rivets (See **Figure 15**), as applicable. Work from the center of the

friction lining out to the ends. The rivets are installed by driving the pin flush with the head.

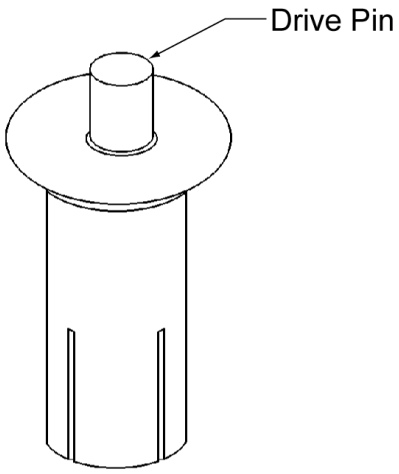


Figure 15

4.7 Assembly of the Element

4.7.1 Make sure all the components have been cleaned and any damaged or worn components have been repaired or replaced.

4.7.2 Assemble one of the side plates to the rim with cap screws and lockwashers. It is not necessary to install through bolts and locknuts at this time.

4.7.3 Lay the rim/side plate assembly on a clean, flat work surface, side plate down.

4.7.4 Carefully insert the air actuating tube into the rim. Push the valves on the tube through the corresponding holes in the rim and install the spiral snap rings (if applicable).

4.7.5 Place a torque bar in each mating hole in the side plate, slide a friction shoe assembly onto each torque bar and carefully tap a release spring (51VC1600, 60VC1600 and 76VC1600 elements have two release springs in each cavity) into place. Make sure the spring is positioned on the side of the torque bar opposite the friction lining. Also, the spring must contact the torque bar at two points, not one. See **Figure 16.**

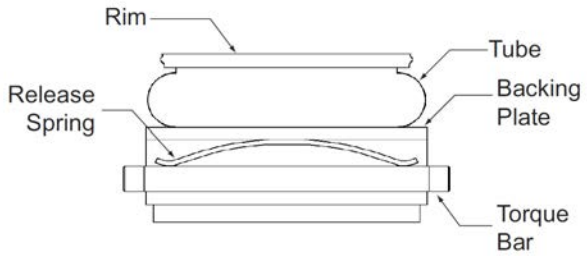


Figure 16

4.7.6 Lay the remaining side plate in position so the air connections and torque bar. Holes are properly aligned.

4.7.7 Carefully guide the torque bars into the corresponding holes in the side plate. It is often helpful to install four equally spaced screws and nuts through the rim and side plate to keep some tension on the side plate throughout this step.

4.7.8 Attach the side plate to the rim with cap screws and lockwashers, making sure all of the torque bars are seated in their side plate holes.

4.7.9 Note the orientation of the air connections and install the through bolts and locknuts where applicable.

4.7.10 Re-install the elbows (or quick release valves), using a good quality sealant on the pipe threads. Install the air connections on single narrow, dual narrow and single wide elements. Install only the short air connections (element closest to spider) on dual wide elements.

4.7.11 Re-install per 2.0.

5.0. SPARE PARTS STORAGE

5.1 Element Assemblies

5.1.1 Element assemblies must always be stored flat. Storage in the standing position may cause the rims to go out-of-round.

5.2 Drums

5.2.1 Drums must be stored open end down. Similar to element assemblies, storage of a drum in the standing position will adversely affect roundness.

5.3 Air Actuating Tubes

5.3.1 Air actuating tubes are shipped from the Airflex plant folded to conserve shipping space. Upon receipt, remove the tube from its crate and allow it to assume its natural shape. Store in a cool, dry area, away from electrical equipment and ultraviolet light.

6.0 ORDERING INFORMATION/ TECHNICAL ASSISTANCE

6.1 Equipment Reference

6.1.1 In any correspondence regarding Airflex equipment, refer to the information on the product nameplate. If not available, note the drum diameter, air connection configuration, mounting arrangement or any other special features and call or write:

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

THE PART LISTS ON THE FOLLOWING PAGES APPLY TO STANDARD ELEMENT ASSEMBLIES ONLY. ELEMENTS USED ON SLIP OR HIGH-TORQUE APPLICATIONS WILL HAVE DIFFERENT COMPONENT PARTS

CONSULT THE AIRFLEX FACTORY OR AN AUTHORIZED AIRFLEX DISTRIBUTOR PRIOR TO ORDERING REPLACEMENT PARTS FOR ANY ELEMENT NOT APPEARING ON THE FOLLOWING LISTS.

7.0 PARTS LISTS

7.1 Single Narrow Element Assemblies

				ITEM															
	Element Description	# of Air Inlets	Part No. of Complete Element	1 Rim	2 Tube	3 Elbow Assy		3A Optional QRV		4 Compression Ring		5 Air Connection Tube		6 Air Connection Gasket		7 FSA	11 Side Plate	12 Torque Bar	13 Release Spring
				Part No. 1 Req'd	Part No. 1 Req'd	Part No.	Qty.	Part No.	Qty.	Part No.	Qty.	Part No.	Qty.	Part No.	Qty.	Part No.	Part No. 2 Req'd	Part No.	Part No.
11.5 VC 500	Minus Side Connection	1 or 2	142639HA	403089	403090	-	-	-	-	-	-	-	-	-	-	414576 8 Req'd	412123	201372 8 Req'd	201373 8 Req'd
	Side Connection	1	142639HJ			131 X 11	1			131 X 20	1	412178-02	1	412324-01	1				
	Side Connection	2	142639HP				2				2		2		2				
14 VC 500	Minus Side Connection	1, 2, or 4	143829HA	406273	406274	-	-	-	-	-	-	-	-	-	-	414513 8 Req'd	412124	307533 8 Req'd	307354 8 Req'd
	Side Connection	1	143829HJ			92 X 6	1	-	-	87 X 12	1	412178-03	1	412324-02	1				
	Quick Release Valve	1	143829HM			-	-	145406DF	1	72 X 31									
	Side Connection	2	143829HP			92 X 6	2	-	-	87 X 12	2		2		2				
	Quick Release Valve	2	143829HN			-	-	145406DF	2	72 X 31									
	Side Connection	4	143829HC			92 X 6	4	-	-	87 X 12	4		4		4				
	Quick Release Valve	4	143829HE			-	-	145406DF	4	72 X 31									
16 VC 500	Minus Side Connection	1, 2, or 4	142640HA	402703	402704	-	-	-	-	-	-	-	-	-	-	414580 8 Req'd	412125	201301 8 Req'd	301352 8 Req'd
	Side Connection	1	142640HJ			92 X 6	1	-	-	87 X 12	1	412178-03	1	412324-02	1				
	Quick Release Valve	1	142640HM			-	-	145406DF	1	72 X 31									
	Side Connection	2	142640HP			92 X 6	2	-	-	87 X 12	2		2		2				
	Quick Release Valve	2	142640HN			-	-	145406DF	2	72 X 31									
	Side Connection	4	142640HC			92 X 6	4	-	-	87 X 12	4		4		4				
	Quick Release Valve	4	142649HE			-	-	145406DF	4	72 X 31									
20 VC 600	Minus Side Connection	1, 2, or 4	142641HA	402732	402733	-	-	-	-	-	-	-	-	-	-	307359 10 Req'd	412126	201301 10 Req'd	301352 10 Req'd
	Side Connection	1	142641HJ			92 X 6	1	-	-	87 X 12	1	412178-03	1	412324-02	1				
	Quick Release Valve	1	142641HM			-	-	145406DF	1	72 X 31									
	Side Connection	2	142641HP			92 X 6	2	-	-	87 X 12	2		2		2				
	Quick Release Valve	2	142641HN			-	-	145406DF	2	72 X 31									
	Side Connection	4	142641HC			92 X 6	4	-	-	87 X 12	4		4		4				
	Quick Release Valve	4	142641HE			-	-	145406DF	4	72 X 31									

				ITEM															
	Element Description	# of Air Inlets	Part No. of Complete Element	1 Rim	2 Tube	3 Elbow Assy		3A Optional QRV		4 Compression Ring		5 Air Connection Tube		6 Air Connection Gasket		7 FSA	11 Side Plate	12 Torque Bar	13 Release Spring
				Part No. 1 Req'd	Part No. 1 Req'd	Part No.	Qty.	Part No.	Qty.	Part No.	Qty.	Part No.	Qty.	Part No.	Qty.	Part No.	Part No. 2 Req'd	Part No.	Part No.
24 VC 650	Minus Side Connection	1, 2, or 4	142642HA	402803	402804	-	-	-	-	-	-	412178-05	2	412324-03	2	414582 12 Req'd	412127	201285 12 Req'd	301352 12 Req'd
	Side Connection	1	142642HJ			92 X 7	1	-	-	87 X 14	1		1		1				
	Quick Release Valve	1	142642HM			-	-	145407DF	1	72 X 32									
	Side Connection	2	142642HP			92 X 7	2	-	-	87 X 14	2		2		2				
	Quick Release Valve	2	142642HN			-	-	145407DF	2	72 X 32									
	Side Connection	4	142642HC			92 X 7	4	-	-	87 X 14	4		4		4				
	Quick Release Valve	4	142642HE			-	-	145407DF	4	72 X 32									
28 VC 650	Minus Side Connection	1, 2, or 4	142643HA	402694	402693	-	-	-	-	-	-	412178-05	2	412324-03	2	414584 14 Req'd	412128	201285 14 Req'd	301352 14 Req'd
	Side Connection	1	142643HJ			92 X 7	1	-	-	87 X 14	1		1		1				
	Quick Release Valve	1	142643HM			-	-	145407DF	1	72 X 32									
	Side Connection	2	142643HP			92 X 7	2	-	-	87 X 14	2		2		2				
	Quick Release Valve	2	142643HN			-	-	145407DF	2	72 X 32									
	Side Connection	4	142643HC			92 X 7	4	-	-	87 X 14	4		4		4				
	Quick Release Valve	4	142643HE			-	-	145407DF	4	72 X 32									
33 VC 650	Minus Side Connection	1, 2, or 4	142644HA	402821	402822	-	-	-	-	-	-	412178-06	2	412324-04	2	414586 16 Req'd	412129	201283 16 Req'd	301333 16 Req'd
	Side Connection	1	142644HJ			92 X 8	1	-	-	87 X 16	1		1		1				
	Quick Release Valve	1	142644HM			-	-	145141DE	1	72 X 33									
	Side Connection	2	142644HP			92 X 8	2	-	-	87 X 16	2		2		2				
	Quick Release Valve	2	142644HN			-	-	145141DE	2	72 X 33									
	Side Connection	4	142644HC			92 X 8	4	-	-	87 X 16	4		4		4				
	Quick Release Valve	4	142644HE			-	-	145141DE	4	72 X 33									

				ITEM															
	Element Description	# of Air Inlets	Part No. of Complete Element	1 Rim	2 Tube	3 Elbow Assy		3A Optional QRV		4 Compression Ring		5 Air Connection Tube		6 Air Connection Gasket		7 FSA	11 Side Plate	12 Torque Bar	13 Release Spring
				Part No. 1 Req'd	Part No. 1 Req'd	Part No.	Qty.	Part No.	Qty.	Part No.	Qty.	Part No.	Qty.	Part No.	Qty.	Part No.	Part No. 2 Req'd	Part No.	Part No.
37 VC 650	Minus Side Connection	1, 2, or 4	142645HA	402671	402670	-	-	-	-	-	-	-	-	-	-	414586 18 Req'd	412130	201283 18 Req'd	301333 18 Req'd
	Side Connection	1	142645HJ			92 X 8	1	-	-	87 X 16	1	412178-06	1	412324-04	1				
	Quick Release Valve	1	142645HM			-	-	145141DE	1	72 X 33									
	Side Connection	2	142645HP			92 X 8	2	-	-	87 X 16	2		2		2				
	Quick Release Valve	2	142645HN			-	-	145141DE	2	72 X 33									
	Side Connection	4	142645HC			92 X 8	4	-	-	87 X 16	4		4		4				
	Quick Release Valve	4	142645HE			-	-	145141DE	4	72 X 33									
42 VC 650	Minus Side Connection	1, 2, or 4	142647HA	402829	402830	-	-	-	-	-	-	-	-	-	-	414590 20 Req'd	412131	201283 20 Req'd	301333 20 Req'd
	Side Connection	1	142647HJ			92 X 8	1	-	-	87 X 16	1	412178-06	1	412324-04	1				
	Quick Release Valve	1	142647HM			-	-	145141DE	1	72 X 33									
	Side Connection	2	142647HP			92 X 8	2	-	-	87 X 16	2		2		2				
	Quick Release Valve	2	142647HN			-	-	145141DE	2	72 X 33									
	Side Connection	4	142647HC			92 X 8	4	-	-	87 X 16	4		4		4				
	Quick Release Valve	4	142647HE			-	-	145141DE	4	72 X 33									

7.2 Dual Narrow Element Assemblies

		ITEM			
		Complete Dual Element	Single Elements*	8 Air Tube Group	9 Spacer Group
11.5 VC 500	Element with two Side Connections	142112	142639HA 2 Req'd	105808	105898
	Elements with four Side Connections	142112C		105808A	
14 VC 500	Element with two Side Connections	143114	143829HA 2 Req'd	105809	105899
	Elements with two Quick Release Values	143114E		105809B	
	Element with four Side Connections	143114C		105809A	
	Elements with four Quick Release Values	143114D		105809C	
16 VC 600	Element with two Side Connections	142115	142640HA 2 Req'd	105810	105900
	Elements with two Quick Release Values	142115E		105810B	
	Element with four Side Connections	142115C		105810A	
	Elements with four Quick Release Values	142115D		105810C	
20 VC 600	Element with two Side Connections	142116	142641HA 2 Req'd	105810	
	Elements with two Quick Release Values	142116E		105810B	
	Element with four Side Connections	142116C		105810A	
	Elements with four Quick Release Values	142116D		105810C	
24 VC 650	Element with two Side Connections	142117	142642HA 2 Req'd	105811	105901
	Elements with two Quick Release Values	142117E		105811B	
	Element with four Side Connections	142117C		105811A	
	Elements with four Quick Release Values	142117D		105811C	
28 VC 650	Element with two Side Connections	142118	142643HA 2 Req'd	105811	
	Elements with two Quick Release Values	142118E		105811B	
	Element with four Side Connections	142118C		105811A	
	Elements with four Quick Release Values	142118D		105811C	
33 VC 650	Element with two Side Connections	142119	142644HA 2 Req'd	105812	105902
	Elements with two Quick Release Values	142119E		105812B	
	Element with four Side Connections	142119C		105812A	
	Elements with four Quick Release Values	142119D		105812C	
37 VC 650	Element with two Side Connections	142120	142645HA 2 Req'd	105812	105903
	Elements with two Quick Release Values	142120E		105812B	
	Element with four Side Connections	142120C		105812A	
	Elements with four Quick Release Values	142120D		105812C	
42 VC 650	Element with two Side Connections	142121	142647HA 2 Req'd	105812	105904
	Elements with two Quick Release Values	142121E		105812B	
	Element with four Side Connections	142121C		105812A	
	Elements with four Quick Release Values	142121D		105812C	

* The second column under "ITEM" lists the part numbers of the two single elements that make up the dual mounted element assembly. To find part numbers of components, locate the element number in the parts list for single element application. Find the part numbers in the corresponding item column.

7.3 Single Wide Element Assemblies

				ITEM															
	Element Description	# of Air Inlets	Part No. of Complete Element	1 Rim	2 Tube	3 Elbow Assy		3A Optional QRV		4 Compression Ring		5 Air Connection Tube		6 Air Connection Gasket		7 FSA	11 Side Plate	12 Torque Bar	13 Release Spring
				Part No. 1 Req'd	Tube 1 Req'd	Part No.	Qty.	Part No.	Qty.	Part No.	Qty.	Part No.	Qty.	Part No.	Qty.	Part No.	Part No. 2 Req'd	Part No.	Part No.
14 VC 1000	Minus Side Connection	1, 2, or 4	142838HA	409141-01	406978	-	-	-	-	-	-	-	-	-	-	414592 8 Req'd	412124	303567 8 Req'd	303150 8 Req'd
	Side Connection	1	142838HJ			92 X 6	1			87 X 12	1	412178-03	1	412324-02	1				
	Side Connection	2	142838HP				2				2		2		2				
16 VC 1000	Minus Side Connection	1, 2, or 4	142821HA	405950-01	405954	-	-	-	-	-	-	-	-	-	-	414594 8 Req'd	412156	301831 8 Req'd	301832 8 Req'd
	Side Connection	1	142821HJ			92 X 6	1	-	-	87 X 12	1	412178-03	1	412324-02	1				
	Quick Release Valve	1	142821HM			-	-	145406DF	1	72 X 31									
	Side Connection	2	142821HP			92 X 6	2	-	-	87 X 12	2		2		2				
	Quick Release Valve	2	142821HN			-	-	145406DF	2	72 X 31									
	Side Connection	4	142821HC			92 X 6	4	-	-	87 X 12	4		4		4				
	Quick Release Valve	4	142821HE			-	-	145406DF	4	72 X 31									
20 VC 1000	Minus Side Connection	1, 2, or 4	142832HA	503302-01	406544	-	-	-	-	-	-	-	-	-	-	414596 8 Req'd	412157	301831 8 Req'd	301832 8 Req'd
	Side Connection	1	142832HJ			92 X 6	1	-	-	87 X 12	1	412178-03	1	412324-02	1				
	Quick Release Valve	1	142832HM			-	-	145406DF	1	72 X 31									
	Side Connection	2	142832HP			92 X 6	2	-	-	87 X 12	2		2		2				
	Quick Release Valve	2	142832HN			-	-	145406DF	2	72 X 31									
	Side Connection	4	142832HC			92 X 6	4	-	-	87 X 12	4		4		4				
	Quick Release Valve	4	142832HE			-	-	145406DF	4	72 X 31									
24 VC 1000	Minus Side Connection	1, 2, or 4	142675HA	404668-01	404675	-	-	-	-	-	-	-	-	-	-	414598 10 Req'd	412158	301831 10 Req'd	301832 10 Req'd
	Side Connection	1	142675HJ			92 X 7	1	-	-	87 X 14	1	412178-05	1	412324-03	1				
	Quick Release Valve	1	142675HM			-	-	145407DF	1	72 X 32									
	Side Connection	2	142675HP			92 X 7	2	-	-	87 X 14	2		2		2				
	Quick Release Valve	2	142675HN			-	-	145407DF	2	72 X 32									
	Side Connection	4	142675HC			92 X 7	4	-	-	87 X 14	4		4		4				
	Quick Release Valve	4	142675HE			-	-	145407DF	4	72 X 32									

				ITEM																	
	Element Description	# of Air Inlets	Part No. of Complete Element	1 Rim	2 Tube		3 Elbow Assy		3A Optional QRV		4 Compression Ring		5 Air Connection Tube		6 Air Connection Gasket		7 FSA	11 Side Plate	12 Torque Bar	13 Release Spring
				Part No. 1 Req'd	Part No. 1 Req'd	Snap Ring 4 Req'd	Part No.	Qty.	Part No.	Qty.	Part No.	Qty.	Part No.	Qty.	Part No.	Qty.	Part No.	Part No. 2 Req'd	Part No.	Part No.
28 VC 1000	Minus Side Connection	1, 2, or 4	142674HA	405503-01	403745	-	-	-	-	-	-	-	-	-	-	-	414600 10 Req'd	412159	301831 10 Req'd	301832 10 Req'd
	Side Connection	1	142674HJ				92 X 7	1	-	-	87 X 14	1	412178-05	1	412324-03	1				
	Quick Release Valve	1	142674HM				-	-	145407DF	1	72 X 32									
	Side Connection	2	142674HP				92 X 7	2	-	-	87 X 14	2		2		2				
	Quick Release Valve	2	142674HN				-	-	145407DF	2	72 X 32									
	Side Connection	4	142674HC				92 X 7	4	-	-	87 X 14	4		4		4				
	Quick Release Valve	4	142674HE				-	-	145407DF	4	72 X 32									
32 VC 1000	Minus Side Connection	1, 2, or 4	142673HA	402330-01	402327	-	-	-	-	-	-	-	-	-	-	-	414602 12 Req'd	412160	301839 12 Req'd	301718 12 Req'd
	Side Connection	1	142673HJ				92 X 7	1	-	-	87 X 14	1	412178-05	1	412324-03	1				
	Quick Release Valve	1	142673HM				-	-	145407DF	1	72 X 32									
	Side Connection	2	142673HP				92 X 7	2	-	-	87 X 14	2		2		2				
	Quick Release Valve	2	142673HN				-	-	145407DF	2	72 X 32									
	Side Connection	4	142673HC				92 X 7	4	-	-	87 X 14	4		4		4				
	Quick Release Valve	4	142673HE				-	-	145407DF	4	72 X 32									
38 VC 1200	Minus Side Connection	1, 2, or 4	142739HA	404503-01	404504	190 X 3	-	-	-	-	-	-	-	-	-	-	511640 12 Req'd	412161	302115 12 Req'd	301908 12 Req'd
	Side Connection	1	142739HJ				92 X 8	1	-	-	87 X 16	1	412178-06	1	412324-04	1				
	Quick Release Valve	1	142739HM				-	-	145141DE	1	72 X 33									
	Side Connection	2	142739HP				92 X 8	2	-	-	87 X 16	2		2		2				
	Quick Release Valve	2	142739HN				-	-	145141DE	2	72 X 33									
	Side Connection	4	142739HC				92 X 8	4	-	-	87 X 16	4		4		4				
	Quick Release Valve	4	142739HE				-	-	145141DE	4	72 X 33									

				ITEM																	
	Element Description	# of Air Inlets	Part No. of Complete Element	1 Rim	2 Tube		3 Elbow Assy		3A Optional QRV		4 Compression Ring		5 Air Connection Tube		6 Air Connection Gasket		7 FSA	11 Side Plate	12 Torque Bar	13 Release Spring
				Part No. 1 Req'd	Part No. 1 Req'd	Snap Ring 4 Req'd	Part No.	Qty.	Part No.	Qty.	Part No.	Qty.	Part No.	Qty.	Part No.	Qty.	Part No.	Part No. 2 Req'd	Part No.	Part No.
42 VC 1200	Minus Side Connection	1, 2, or 4	142677HA	403800-01	404504	190 X 3	-	-	-	-	-	-	-	-	-	-	511642 14 Req'd	412162	302115 14 Req'd	301908 14 Req'd
	Side Connection	1	142677HJ				92 X 8	1	-	-	87 X 16	1	412178-06	1	412324-04	1				
	Quick Release Valve	1	142677HM				-	-	145141DE	1	72 X 33									
	Side Connection	2	142677HP				92 X 8	2	-	-	87 X 16	2		2		2				
	Quick Release Valve	2	142677HN				-	-	145141DE	2	72 X 33									
	Side Connection	4	142677HC				92 X 8	4	-	-	87 X 16	4		4		4				
	Quick Release Valve	4	142677HE				-	-	145141DE	4	72 X 33									
46 VC 1200	Minus Side Connection	1, 2, or 4	142671HA	404602	403901	190 X 3	-	-	-	-	-	-	-	-	-	-	414439 16 Req'd	412163	302115 16 Req'd	301908 16 Req'd
	Side Connection	1	142671HJ				92 X 8	1	-	-	87 X 16	1	412178-07	1	412324-04	1				
	Quick Release Valve	1	142671HM				-	-	145141DE	1	72 X 33									
	Side Connection	2	142671HP				92 X 8	2	-	-	87 X 16	2		2		2				
	Quick Release Valve	2	142671HN				-	-	145141DE	2	72 X 33									
	Side Connection	4	142671HC				92 X 8	4	-	-	87 X 16	4		4		4				
	Quick Release Valve	4	142671HE				-	-	145141DE	4	72 X 33									
52 VC 1200	Minus Side Connection	1, 2, or 4	142841HA	503985	503986	190 X 83	-	-	-	-	-	-	-	-	-	-	414439 18 Req'd	412164	303929 18 Req'd	301908 18 Req'd
	Side Connection	1	142841HJ				92 X 10	1	-	-	87 X 20	1	412178-08	1	412324-05	1				
	Quick Release Valve	1	142841HM				-	-	145413BD	1										
	Side Connection	2	142841HP				92 X 10	2	-	-		2		2		2				
	Quick Release Valve	2	142841HN				-	-	145413BD	2										
	Side Connection	4	142841HC				92 X 10	4	-	-		4		4		4				
	Quick Release Valve	4	142841HE				-	-	145413BD	4										

				ITEM																
	Element Description	# of Air Inlets	Part No. of Complete Element	1 Rim	2 Tube		3 Elbow Assy		3A Optional QRV		4 Compression Ring		5 Air Connection Tube		6 Air Connection Gasket		7 FSA	11 Side Plate	12 Torque Bar	13 Release Spring
				Part No. 1 Req'd	Part No. 1 Req'd	Snap Ring 4 Req'd	Part No.	Qty.	Part No.	Qty.	Part No.	Qty.	Part No.	Qty.	Part No.	Qty.	Part No.	Part No. 2 Req'd	Part No.	Part No.
51 VC 1600	Minus Side Connection	1, 2, or 4	142835HA	511644	505580	190 X 83	-	-	-	-	-	-	-	-	-	-	511644 18 Req'd	412165	308639 18 Req'd	304215 36 Req'd
	Side Connection	2	142835HP				92 X 10	2	-	-	87 X 20	2	412178-09	2	412324-05	2				
	Side Connection	4	142835HC					4	-	-		4		4		4				
60 VC 1600	Minus Side Connection	1, 2, or 4	142915MB	510629	511348	190 X 15	-	-	-	-	-	-	-	-	-	-	511646 20 Req'd	412166	304214 20 Req'd	304215 40 Req'd
	Side Connection	2	142915MA				153 X 791	2	-	-	87 X 20	2	412178-18	2	412324-06	2				
	Quick Release Valve	2	142915HN				-	-	145413BD	2										
	Side Connection	4	142915HC				153 X 791	4	-	-		4		4		4				
	Quick Release Valve	4	142915HE				-	-	145413BD	4										
66 VC 1600	Minus Side Connection	1, 2, or 4	142097HA	509548	511350	190 X 15	-	-	-	-	-	-	-	-	-	-	511646 22 Req'd	509527	304214 22 Req'd	304215 44 Req'd
	Side Connection	4	142097HC				92 X 10	4	-	-	87 X 20	4	412178-04	4	412324-06	4				
76 VC 1600	Side Connection	4	-	515144	515142	190 X 15	92 X 10	4	-	-	87 X 20	4	412178-04	4	412324-06	4	515156 25 Req'd	515140	304214 25 Req'd	304215 50 Req'd
76 VC 2000	Side Connection	4	-	515377	515375	190 X 15	92 X 10	4	-	-	87 X 20	4	412178-04	4	412324-06	4	515381 25 Req'd	515384	308576 25 Req'd	308577 25 Req'd

7.4 Dual Wide Element Assemblies

		ITEM		
	Complete Dual Element With Four Side Connections	**Single Elements**	**8 Air Tube Group**	**9 Spacer Group**
16VC1000	142122C	142821HA 2 Req'd	105815A	105905
20VC1000	142123C	142832HA 2 Req'd		405905
24VC1000	142124C	142675HA 2 Req'd		105901
28VC1000	142125C	142674HA 2 Req'd		
32VC1000	142126C	142673HA 2 Req'd		105906
38VC1200	142127C	142739HA 2 Req'd	105817A	105907
42VC1200	142128C	142677HA 2 Req'd		105908
46VC1200	142129C	142671HA 2 Req'd	105891A	105909
52VC1200	142131C	142841HA 2 Req'd	105893A	105910
51VC1600	142130C	142835HA 2 Req'd	105892A	
60VC1600	142132AL	142915MB 2 Req'd	105894A	105911
66VC1600	142198P	142097HA 2 Req'd	105897A	-
76VC1600	146509P	Contact Factory	-	
76VC2000	146531P	-	108131A	

***** The second column under "ITEM" lists the part numbers of the two142119E single elements that make up the dual mounted element assembly. To find part numbers of components, lo142119Ccate the element number in the parts list for single element application. Find the part numbers in the cor142119Dresponding item column.142120

All elements are dual drilled.

8.0. REPAIR KITS

8.1 Friction Block and Rivet Kits

NARROW SERIES							
ELEMENT SIZE	**KIT NUMBER**	**FRICTION BLOCKS**	**QTY. FRICTION BLOCKS**	**RIVETS**		**QTY.* RIVETS**	
11.5VC500	146236AA	414575	8	130 X 72		54	
14VC500	146236AB	414577				90	
16VC600	146236AC	414579				90	
20VC600	146236AD	307358	10	130 X 71		110	
24VC650	146236AE	414581	12	130 X 72		130	
28VC650	146236AF	414583	14			150	
33VC650	146236AG	414585	16	130 X 73		170	
35VC650	146236AH	414587	18	130 X 72		190	
37VC650	146236AJ	414585		130 X 73			
42VC650	146236AK	414589	20	130 X 73		210	
WIDE SERIES							
ELEMENT SIZE	**KIT NUMBER**	**FRICTION BLOCKS**	**QTY. FRICTION BLOCKS**	**RIVETS**		**QTY.* RIVETS**	
14VC1000	146237AA	414591	16	130 X 72		102	
16VC1000	146237AB	414593	8			90	
20VC1000	146237AC	414595					
24VC1000	146237AD	414597	10			110	
28VC1000	146237AE	414599					
ELEMENT SIZE	**KIT NUMBER**	**FRICTION BLOCKS**	**QTY. FRICTION BLOCKS**	**SCREWS**	**QTY.* SCREWS**	**NUTS**	**QTY.* NUTS**
32VC1000	146237AF	414601	12	330 X 208	130	110 X 23	130
38VC1200	146237AG	511639					
42VC1200	146237AH	511641	14	330 X 208	150	110 X 23	150
46VC1200	146237AJ	414438	32		198		198
52VC1200	146237AK	414438	36		222		222
51VC1600	146237AL	511643					
60VC1600	146237AM	511645	40		246		246
66VC1600	146237AN	511645	44		270		270
76VC1600	146237AR	515145	50		306		306
76VC2000	146237AW	515380			416		416
*Extra fasteners supplied with each kit.							

8.2 Friction Shoe Assembly, Torque Bar, and Release Spring Kits

NARROW SERIES							
ELEMENT SIZE	**KIT NUMBER**	**FRICTION SHOES**	**QTY. FRICTION SHOES**	**TORQUE BARS**	**QTY. TORQUE BARS**	**SPRINGS**	**QTY. SPRINGS**
11.5VC500	146236A	414576	8	201372	8	201373	8
14VC500	146236B	414513		307353		307354	
16VC600	146236C	414580		201301		301352	
20VC600	146236D	307359	10		10		10
24VC650	146236E	414582	12	201285	12		12
28VC650	146236F	414584	14		14		14
33VC650	146236G	414586	16	201283	16	301333	16
35VC650	146236H	414588	18		18	301352	18
37VC650	146236J	414586				301333	
42VC650	146236K	414590	20		20		20

WIDE SERIES							
ELEMENT SIZE	**KIT NUMBER**	**FRICTION SHOES**	**QTY. FRICTION SHOES**	**TORQUE BARS**	**QTY. TORQUE BARS**	**SPRINGS**	**QTY. SPRINGS**
14VC1000	146237A	414592	8	303567	8	303150	8
16VC1000	146237B	414594		301831		301832	
20VC1000	146237C	414596					
24VC1000	146237D	414598	10		10		10
28VC1000	146237E	414600					
32VC1000	146237F	414602	12	301839	12	301718	12
38VC1200	146237G	511640		302115		301908	
42VC1200	146237H	511642	14		14		14
46VC1200	146237J	414439	16		16		16
52VC1200	146237K		18	303929	18		18
51VC1600	146237L	511644		308639		304215	36
60VC1600	146237M	511646	20	304214	20		40
66VC1600	146237N		22		22		44
76VC1600	146237V	515762	25	308648	25		50
76VC2000	146237W	515381		308576		308577	25

8.3 Spring Kits

NARROW SERIES				WIDE SERIES			
ELEMENT SIZE	**KIT NUMBER**	**SPRINGS**	**QTY SPRINGS**	**ELEMENT SIZE**	**KIT NUMBER**	**SPRINGS**	**QTY SPRINGS**
11.5VC500	146500BA	201373	8	14VC1000	146500BL	303150	8
14VC500	146500BB	307354		16VC1000	146500BM	301832	
16VC600	146500BC	301352		20VC1000			
20VC600	146500BD		10	24VC1000	146500BN		10
24VC650	146500BE		12	28VC1000			
28VC650	146500BF		14	32VC1000	146500BP	301718	12
33VC650	146500BG	301333	16	38VC1200	146500BQ	301908	
35VC650	146500BH	301352	18	42VC1200	146500BR		14
37VC650	146500BJ	301333		46VC1200	146500BS		16
42VC650	146500BK		20	52VC1200	146500BT		18
				51VC1600	146500BV	304215	36
				60VC1600	146500BW		40
				66VC1600	146500BX		44
				76VC1600	146500BY		50

8.4 Torque Bar Kits

NARROW SERIES				WIDE SERIES			
ELEMENT SIZE	KIT NUMBER	TORQUE BARS	QTY TORQUE BARS	ELEMENT SIZE	KIT NUMBER	TORQUE BARS	QTY TORQUE BARS
11.5VC500	146500AA	201372	8	14VC1000	146500AK	303567	8
14VC500	146500AB	307353		16VC1000	146500AL	301831	
16VC600	146500AC	201301		20VC1000			
20VC600	146500AD		10	24VC1000	146500AM		10
24VC650	146500AE	201285	12	28VC1000			
28VC650	146500AF		14	32VC1000	146500AN	301839	12
33VC650	146500AG	201283	16	38VC1200	146500AP	302115	
35VC650	146500AH		18	42VC1200	146500AQ		14
37VC650				46VC1200	146500AR		16
42VC650	146500AJ		20	52VC1200	146500AS	303929	18
				51VC1600	146500AT	308369	
				60VC1600	146500AV	304214	20
				66VC1600	146500AW		22
				76VC1600	146500AX	308648	25

8.5 Friction Shoe Assembly Kits

NARROW SERIES				WIDE SERIES			
ELEMENT SIZE	KIT NUMBER	FSA	QTY FSAs	ELEMENT SIZE	KIT NUMBER	FSA	QTY FSAs
11.5VC500	146500CA	414576	8	14VC1000	146500CK	414592	8
14VC500	146500CB	414513		16VC1000	146500CL	414594	
16VC600	146500CC	414580		20VC1000	146500CM	414596	
20VC600	146500CD	307359	10	24VC1000	146500CN	414598	10
24VC650	146500CE	414582	12	28VC1000	146500CP	414600	
28VC650	146500CF	414584	14	32VC1000	146500CQ	414602	12
33VC650	146500CG	414586	16	38VC1200	146500CR	511640	
35VC650	146500BZ	414588	18	42VC1200	146500CS	511642	14
37VC650	146500CH	414586		46VC1200	146500CT	414439	16
42VC650	146500CJ	414590	20	52VC1200	146500CV		18
				51VC1600	146500CW	511644	
				60VC1600	146500CX	511646	20
				66VC1600	146500CY		22
				76VC1600	146500CZ	515156	25

8.6 QRV Connection Kits

NARROW SERIES							
ELEMENT SIZE	**KIT NUMBER**	**QRV**	**QTY QRV**	**AIR CONNECTION**	**QTY AIR CONNECTION**	**WASHER**	**QTY WASHER**
14VC500	146611D	145406DF	1	412178-03	1	412324-01	1
16VC600	146611E					412324-02	
20VC600							
24VC650	146611F	145407DF		412178-05		412324-03	
28VC650							
33VC650	146611G	145141DE		412178-06		412324-04	
37VC650							
42VC650							
WIDE SERIES							
ELEMENT SIZE	**KIT NUMBER**	**QRV**	**QTY QRV**	**AIR CONNECTION**	**QTY AIR CONNECTION**	**WASHER**	**QTY WASHER**
16VC1000	146611E	145406DF	1	412178-03	1	412324-02	1
20VC1000							
24VC1000	146611F	145407DF		412178-05		412324-03	
28VC1000							
32VC1000							
38VC1200	146611G	145141DE		412178-06		412324-04	
42VC1200							
46VC1200	146611H			412178-07			
52VC1200	146611J	146506BD		412178-08		412324-05	

8.7 Air Connection Kits

NARROW SERIES							
ELEMENT SIZE	**KIT NUMBER**	**AIR CONN. TUBE**	**QTY AIR CONN. TUBE**	**ELBOW/ FITTING**	**QTY ELBOW**	**WASHER**	**QTY WASHER**
AIR TUBE KITS							
11.5VC500	146500A	412178-02	1	131 X 11	1	412324-01	1
14VC500	146500R	412178-03		92 X 6		412324-02	
14VC500	146500B						
16VC600							
20VC600							
24VC650	146500C	412178-05		92 X 7		412324-03	
28VC650							
33VC650	146500D	412178-06		92 X 8		412324-04	
37VC650							
42VC650							

WIDE SERIES							
ELEMENT SIZE	**KIT NUMBER**	**AIR CONN. TUBE**	**QTY AIR CONN. TUBE**	**ELBOW**	**QTY ELBOW**	**WASHER**	**QTY WASHER**
AIR TUBE KITS							
14VC1000	146500B	412178-03	1	92 X 6	1	412324-02	1
16VC1000							
20VC1000							
24VC1000	146500C	412178-05		92 X 7		412324-03	
28VC1000							
32VC1000							
38VC1200	146500D	412178-06		92 X 8		412324-04	
42VC1200							
46VC1200	146500F	412178-07					
52VC1200	146500G	412178-08		92 X 10		412324-05	
51VC1600	146500H	412178-09					
60VC1600	146500J	412178-18		153 X 791		412324-06	
66VC1600	146500K	412178-04		92 X 10			
76VC1600							

8.8 Replacement Kits – Narrow Element Assemblies

NARROW SERIES																
ELEMENT SIZE	KIT NUMBER	ELBOW		TORQUE BAR		SPRING		TUBE		AIR CONN TUBE		WASHER		FRIC SHOE ASSEMBLY		RIVETS	
		PN	QTY	PN	QTY	PN	QTY	PN	QTY	PN	QTY	PN	QTY	PN	QTY	PN	QTY
11.5VC500	107479A	131 X 11	2	201372	8	201373	8	403090	1	412178-02	2	412324-01	2	414576	8	-	-
	107479AA													414575		130 X 72	54
14VC500	107479B	77 X 4 92 X 6		307353		307354		406274		412178-03		412324-02		414513		-	-
	107479AB													414577		130 X 72	90
16VC600	107479C			201301		301352		402704						414580		-	-
	107479AC													414579		130 X 72	90
20VC600	107479D			201301	10	301352	10	402733						307359	10	-	-
	107479M													414995			
	107479AD													30758		130 X 71	110
	107479AM													414994			
24VC650	107479E	77 X 3 92 X 7		201285	12	301352	12	402804		412178-05		412324-03		414582	12	-	-
	107479L													414891			
	107479AE													414581		130 X 72	130
	107479AL													414890			
28VC650	107479F				14		14	402693						414584	14	-	-
	107479Q							405404									
	107479BK							402693						303582			
	107479BN													414990			
	107479AF													414583		130 X 72	150
	107479CJ													414859			
33VC650	107479G	77 X 8 92 X 8		201283	16	301333	16	402822		412178-06		412324-04		414586	16	-	-
	107479AG													414585		130 X 73	160
35VC650	107479H				18	301352	18	406382						414588	18	-	-
37VC650	107479J					301333		402670						414586			
	107479AJ													414585			
42VC650	107479K				20		20	402830						414590	20		

8.9 Replacement Kits – Wide Element Assemblies

WIDE SERIES																	
ELEMENT SIZE	KIT NUMBER	ELBOW		TORQUE BAR		SPRING		TUBE		AIR CONN TUBE		WASHER		FRIC SHOE ASSEMBLY		FASTENER	
		PN	QTY	PN	QTY	PN	QTY	PN	QTY	PN	QTY	PN	QTY	PN	QTY	PN	QTY
12VC1000	107479Y	131 X 11	2	303567	8	303150	8	407648	1	412178-11	2	412324-01	2	414924	8	-	-
28VC1000	107479T	77 X 3 92 X 7		301831	10	301832	10	403745		412178-05		412324-03		414600	10	130 X 72	110
	107479AT													414599			
32VC1000	107479BA			301839	12	301718	12	402327						414602	12	-	-
	107479BS							408469									
	107479CR							402327						408157			
	107479CA													414601		110 X 23 330 X 208	130
38VC1200	107479BB	77 X 8 92 X 8		302115		301908	16	404504		412178-06		412324-04		511640		-	-
	107479BM													505172			
	107479BR							508933						511640			
	107479BP			307679				404504									
	107479CB			302115	14		14	413771						511639		110 X 23 330 X 208	130
42VC1200	107479AX													511641	14		150
	107479BU							403799						512321		-	-
46VC1200	107479S				16			403901		412178-07				414439	16		
	107479AS													414438	32	110 X 23 330 X 208	202
52VC1200	107479BC	77 X 7 92 X 10		303929	18		18	503986		412178-08		412324-05		414439	18	-	-
	107479BL													409381			
	107479CC													414439		110 X 23 330 X 208	216
	107479BT	153 X 805 153 X 820						510847						414438	36	-	-
60VC1600	107479BD	153 X 791	4	304214	20	304215	20	511348		412178-18		412324-06	4	511646	20		
	107479CD													511645	40	110 X 23 330 X 208	240
66VC1600	107479BE	92 X 10			22		44	511350		412178-04	4			511646	22	-	-
	107479BW				21		42	107236							21		
76VC1600	107479BV		2		25		50	515142			2		2	515156	25		
76VC2000	107479CP	72 X 40 77 X 7 92 X 10		308576		308577	25	515375						515380	50	110 X 23 330 X 208	416

8.10 Rebuild Kits – Wide Element Assemblies

WIDE SERIES																	
ELEMENT SIZE	**KIT NUMBER**	**ELBOW**		**TORQUE BAR**		**SPRING**		**TUBE**		**AIR CONN TUBE**		**WASHER**		**FRIC SHOE ASSEMBLY**		**FASTENERS**	
		PN	**QTY**	**PN**	**QTY**	**PN**	**QTY**	**PN**	**QTY**	**PN**	**QTY**	**PN**	**QTY**	**PN**	**QTY**	**PN**	**QTY**
14VC1000	107479W	77 X 4 92 X 6	2	303567	8	303150	8	406978	1	412178-03	2	412324-02	2	414592	8	-	-
	107479CK	153 X 353 153 X 354						410278		412178-13							
16VC1000	107479BG	77 X 4 92 X 6		301831		301832		405954		412178-03				415352			
	107479BH													414901			
	107479Z													414594			
	107479AZ													414593		130 X 72	90
20VC1000	107479R							406544						414596		-	-
	107479RA							413115									
	107479AR							406544						414595		130 X 72	90
24VC1000	107479N	77 X 3 92 X 7			10		10	404675		412178-05		412324-03		414598	10	-	-
	107479AN													414597		130 X 72	100
42VC1200	107479X	77 X 8 92 X 8		302115	14	301908	14	403799		412178-06				511642	14	-	-
46VC1200	107479BF				16		16	408470		412178-07				415850	16		
51VC1600	107479P	77 X 7 92 X 10		308639	18	304215	36	505580		412178-09		412324-05		511644	18		
	107479CN							513565						507747			
	107479AP							505580						511643	36	110 X 23 330 X 208	216

9.0 REVISION

Original Publication Date: August, 1989		
Revision Date	**Change**	**Page(s)**
December 2006	Added 76VC1600 revision	Various
March 2010	Update Cover to current standards	Cover
	Adjusted Copyright Date	All
	Added DW76VC2000 to Table 1	67
	Added SW66VC1600 to Table 2	8
	Added SW76VC2000 to Table 2	8
	Added DW76VC2000 to Table 2	8
	Added 66VC1600 to Table 3	10
	Added 76VC1600 to Table 3	10
	Added 76VC2000 to Table 3	10
	Corrected Maximum RPM of 66VC1600 from 520 to 480 in Table 4	12
	Added 76VC1600 to Table 4	12
	Added 76VC2000 to Table 4	12
	Changed Element size from 51, 60 and 76 VC1600 to 51VC1600 thru 76VC2000 in Table 5	13
	Changed Element size from 51 thru 76VC1600 to thru 76VC2000 in Table 6	14
	Added 76VC1600 and 76VC2000 to Table 7	17
	Corrected Internet Address	18
	Corrected "Single Narrow" to "Single Wide" in title of Section 7.3	23
	Added 76VC2000 to Section 7.3	27
	Added 76VC2000 to Section 7.4	28
	Added 76VC2000 to Section 8.1	28
	Added 76VC2000 to Section 8.2	29
	Added Section 9.0 revisions	30
	Updated warranty page	Last
May 2019	Updated manual to current format	All
	Updated 412628 PN from 412626 in Section 7.1	21
	Added Section 8.3 (Spring Kits)	31
	Added Sections 8.4 (Torque Bar Kits) & 8.5 (Friction Shoe Assembly Kits)	32
	Added Section 8.6 (QRV Connection Kits)	33
	Added Section 8.7 (Air Connection Kits)	34
	Added Section 8.8 (Replacement Kits – Narrow Element Assemblies)	35
	Added Section 8.9 (Replacement Kits – Wide Element Assemblies)	36
	Added Section 8.10 (Rebuild Kits – Wide Element Assemblies)	37

Eaton
Hydraulics Group USA
Airfiex Division
9919 Clinton Road
Cleveland, Ohio 44144-1077
Tel: 216-281-2211
Fax: 216-281-3890

Eaton
Hydraulics Group Asia Pacific
Airflex Division
281 Fa Sai Road
Waigaoqiao Free Trade Zone
Shanghai 200131
China
Tel:(+8621) 5048-4811
Fax:(+8621) 5048-4911

Document no E-CLCL-RR002-E
May 2019

