Tolomatic™
EXCELLENCE IN MOTION

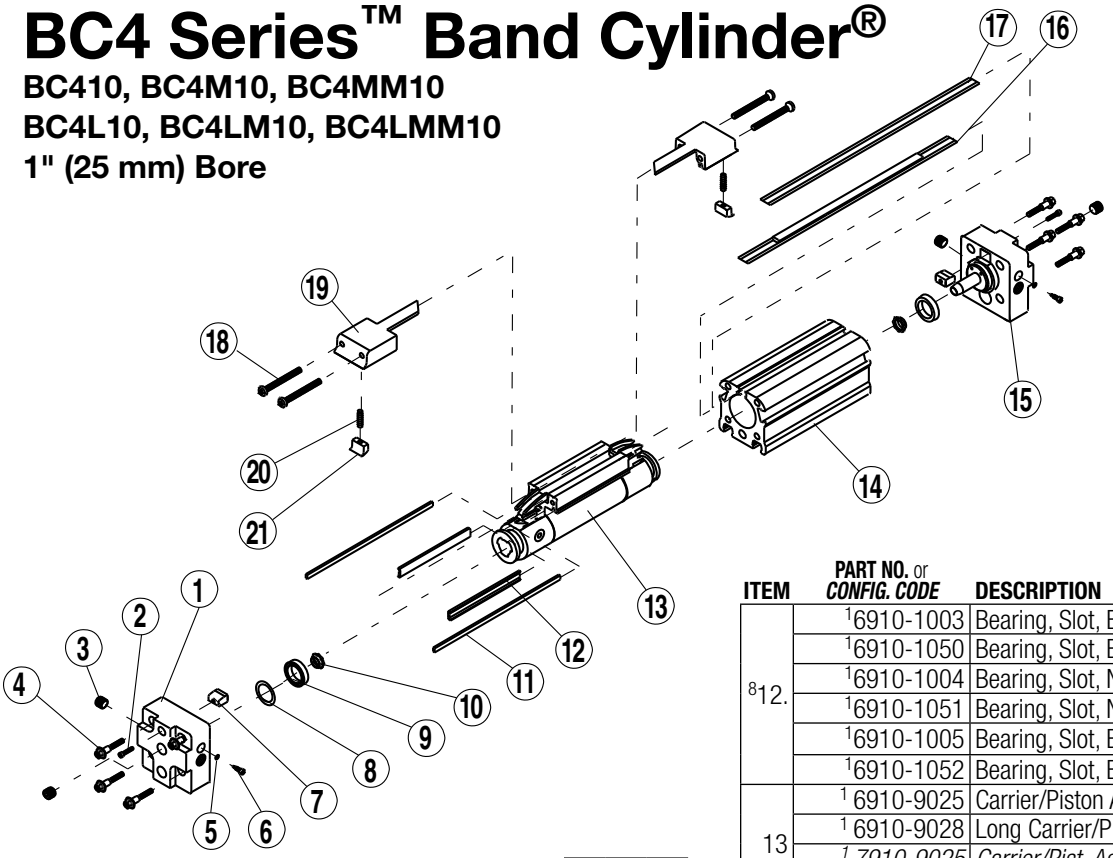
Parts Sheet

6900-4002_18

BC4 Series™ Band Cylinder®

BC410, BC4M10, BC4MM10
BC4L10, BC4LM10, BC4LMM10
1" (25 mm) Bore

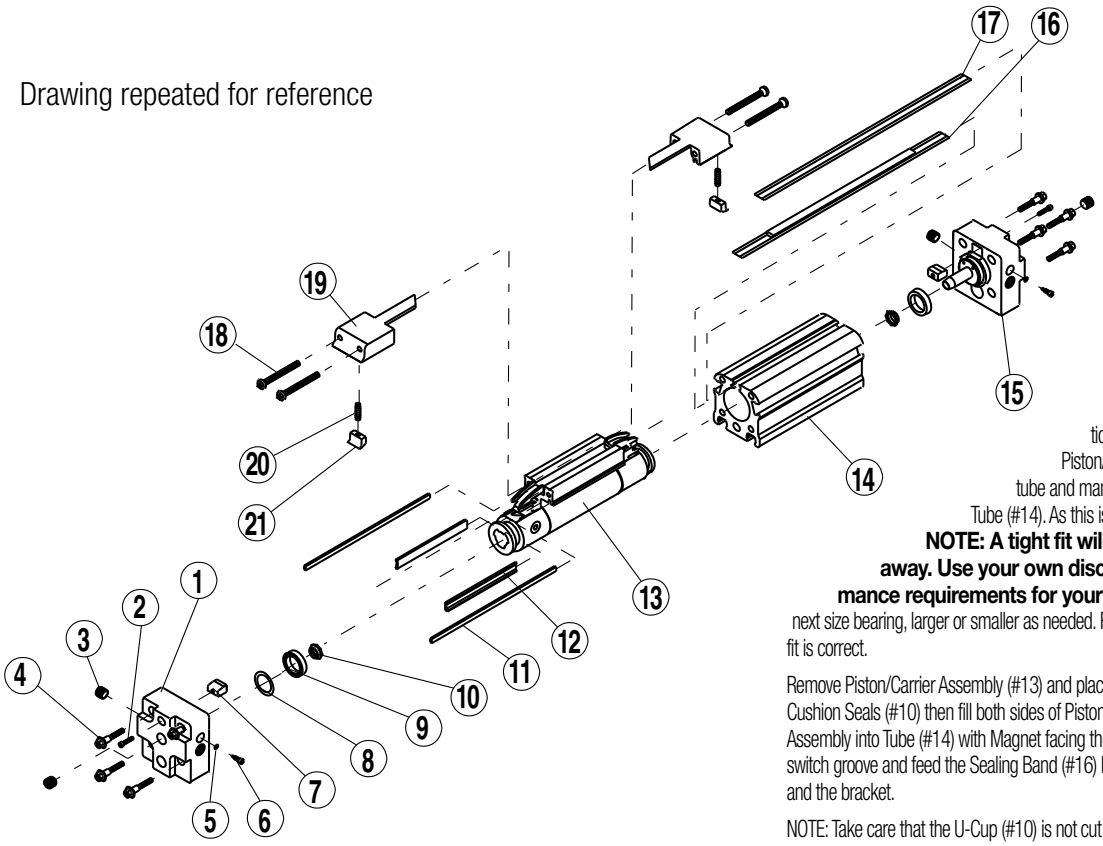
DISCONTINUED PRODUCT STYLE OR SIZE. PARTS SHEET IS FOR REPAIR USE ONLY.



ITEM	PART NO. or *CONFIG. CODE*	DESCRIPTION	QTY. BC4(L)10 U.S. Standard	QTY. BC4(L)M10 Metric Taper Heads	QTY. BC4(L)M10 Metric Parallel Heads
1	6910-9015	Left Head Assy. US Std.	1	–	–
	7910-9000	*Left Head Assy. Metric Taper*	–	*1*	–
	8910-9000	*Left Head Assy. Metric Parallel*	–	–	*1*
2	[3]1207-1027	Socket Head Cap Screw US Std.	2	–	–
	[4,5]4415-1024	*Socket Head Cap Screw Metric*	–	*2*	*2*
3	[3]1014-1065	Pipe Plug	4	–	–
	[4]4910-1002	*Pipe Plug Metric Taper*	–	*4*	–
	[5]5910-1006	*Pipe Plug Metric Parallel*	–	–	*4*
[7]4	0910-1344	Head Bolt US Std.	8	–	–
	4910-1344	*Head Bolt Metric*	–	*8*	*8*
5	[1,2,3,4,5]0910-1178	O-Ring	2	2	2
6	[3,4,5]0910-1177	Cushion Needle	2	2	2
7	[3]0910-1343	Band Clamp	2	–	–
	[4,5]4910-1343	*Band Clamp, Metric*	–	*2*	*2*
8	[1,2]0910-1160	O-Ring	2	2	2
9	[1,2]0910-1206	U-Cup	2	2	2
10	[1,2]0910-1184	Cushion Seal	2	2	2
11	[1]6910-1029	Wiper, Carrier	2	2	2
	[1]6910-1053	Wiper, Carrier, LCU	2	2	2
[8]12.	[1]6910-1003	Bearing, Slot, Blue	2	2	2
	[1]6910-1050	Bearing, Slot, Blue	2	2	2
	[1]6910-1004	Bearing, Slot, Natural	2	2	2
	[1]6910-1051	Bearing, Slot, Natural	2	2	2
	[1]6910-1005	Bearing, Slot, Black	2	2	2
	[1]6910-1052	Bearing, Slot, Black	2	2	2
13	[1] 6910-9025	Carrier/Piston Assy	1	–	–
	[1] 6910-9028	Long Carrier/Pist Assy	1	–	–
	[1] 7910-9025	*Carrier/Pist. Assy, Metric*	–	*1*	*1*
	[1] 7910-9028	*Long Carrier/Pist Assy, Metric*	–	*1*	*1*
14	[6]RTBBC4(L)10	Replacement Tube (6910-1010) specify stroke	A/R	–	–
	[6]RTBBC4(L)M10		–	*A/R*	–
	[6]RTBBC4(L)MM10		–	–	*A/R*
15	6910-9016	Right Head Assy. US STd.	1	–	–
	7910-9001	Right Head Assy. Metric Taper	–	1	–
	8910-9001	Right Head Assy. Metric Parallel	–	–	1
16	[1,6]NSBBC410	Replacement Seal Band (6910-1046) specify stroke	A/R	–	–
	[1,6]NSBBC4M10		–	*A/R*	–
	[1,6]NSBBC4MM10		–	–	*A/R*
	[1,6]NSBBC4L10	Replacement Seal Band; Long Carrier (6910-1064) specify stroke	A/R	–	–
	[1,6]NSBBC4LM10		–	*A/R*	–
	[1,6]NSBBC4LMM10		–	–	*A/R*
17	[1,6]NDBBC410	Replacement Dust Band (6910-1045) specify stroke	A/R	–	–
	[1,6]NDBBC4M10		–	*A/R*	–
	[1,6]NDBBC4MM10		–	–	*A/R*
	[1,6]NDBBC4L10	Replacement Dust Band; Long Carrier (6910-1065) specify stroke	A/R	–	–
	[1,6]NDBBC4LM10		–	*A/R*	–
	[1,6]NDBBC4LMM10		–	–	*A/R*
18	[1]6910-1025	Screw, Pan	4	4	4
19	[1]6910-1006	End Cap	2	2	2
20	[1]0605-1008	Spring, Compression	2	2	2
21	[1]6910-1007	Wiper, Band	2	2	2

1 Repair Kit: Parts contained in Repair Kit RKBC4(L)(M,MM)10SK_ _ _
2Seal Kit: Parts contained in Seal Kit #6910-9022
3 Head Assy.: Parts contained in Head Assembly #6910-9015 & 6910-9016
4 Head Assy.: Parts contained in Head Assembly #7910-9000 & 7910-9001
5 Head Assy.: Parts contained in Head Assembly #8910-9000 & 8910-9001
6 After configuration code add: **SK**_ _ _ (note: the letters SK indicate stroke, follow these letters with the stroke length in decimal inches.) If the actuator has the dual carrier option add the code **DC**_ _ _ (note: follow the letters DC with the distance between the carriers in decimal inches.)
7 NOTE: When replacing the head bolts in actuators manufactured prior to July 1, 2006, the hole for the head bolt will need to be drilled 0.4" (10mm) deeper to accommodate the longer screw length.
8 NOTE: Repair Kits include 3 sets of color coded Slot Bearings. Select the same color combinations as originally installed.

Drawing repeated for reference



DISCONTINUED PRODUCT STYLE OR SIZE. PARTS SHEET IS FOR REPAIR USE ONLY.

CYLINDER DISASSEMBLY INSTRUCTIONS FOR INSTALLATION OF REPAIR KITS ONLY

1. Remove Band Cylinder from machinery.
2. Remove any foot mounting hardware external shock absorbers or switches if present. Remove the four Head Bolts (#4) and loosen the SHCS (#2) on each cylinder Head (#1, #15). Remove Heads.
3. Remove Screws (#18) from End Caps (#19) and slide End Caps off Carrier (#13). Remove top Dust Band (#17). Remove the Carrier Assembly (#13) from the Tube (#14).
4. Dislodge the inner Sealing Band (#16) from its groove by gently pressing down on the band with an O-ring Pick or similar tool. (When doing so, take care that NO SCRATCHES are made in the tube bore slot.) Remove Sealing Band (#16).

CYLINDER ASSEMBLY INSTRUCTIONS

1. CLEAN AND LUBRICATE
   Thoroughly clean all components, particularly the tube bore slot and bands. Thoroughly lubricate the tube with RheoGel TEK664 grease. Apply light coat of grease to Sealing Band (#16) and Dust Band (#17).

2. ASSEMBLE SEALING BAND

CAUTION: Metal edges of Sealing Band are sharp. Exercise caution to avoid injury to yourself of the Band and Tube when inserting.

Carefully install Sealing Band (#16) by passing it sideways though the slot in the tube. Position Sealing Band, rubber up, on the bottom of the tube with equal length of band extending out both ends of the tube.

3. INSTALL PISTON/CARRIER ASSEMBLY

Lubricate and install new U-Cups (#9) (lip seals facing out) onto Piston ends (#13). Lubricate and install new Cushion Seals (#10) (small end facing out) into Piston ends and rotate to seat them in their grooves.

NOTE: If the cylinder will be used with optional shock absorber packages, do not install the Cushion Seals. Doing so will adversely affect shock performance.

4. INSTALL CARRIER BEARINGS

Repair Kits include 3 sets of color coded Slot Bearings (#12). Select the same color combination Slot Bearings as originally installed. Insert Piston/Carrier Assembly (#13) and Slot Bearings into tube and manually push the Carrier the full length of the Tube (#14). As this is done check that the fit of the Carrier is firm.

NOTE: A tight fit will result in higher cylinder breakaway. Use your own discretion in determining performance requirements for your application. If it is insufficient, select the next size bearing, larger or smaller as needed. Repeat until fit is correct.

Remove Piston/Carrier Assembly (#13) and place a small amount of RheoGel TEK664 into the Cushion Seals (#10) then fill both sides of Piston completely with grease. Install Piston/Carrier Assembly into Tube (#14) with Magnet facing the die mark that is located in the switch groove and feed the Sealing Band (#16) between the Piston and the bracket.

NOTE: Take care that the U-Cup (#10) is not cut as the first end of the Piston is inserted into the Tube.

a. Manually slide Piston/Carrier Assembly (#13) the length of the Tube (#14) to seat the Sealing Band (#16) into the groove until end of piston is present at other end of tube. As the end of the Piston exits the Tube, grease should be present on the Piston. If not, the tube was not properly greased. Wipe off any excess grease. DO NOT REMOVE THE PISTON FROM THE TUBE, doing so will require installing new sealing band. Leaving the piston in place, proceed to (b.) below.

b. **The Sealing Band is intentionally cut longer than the tube to eliminate indentations caused when U-cup on piston assembly enters the tube to seat the sealing band.** To remove these indentations, carefully pull the Sealing Band (#16) out the end of the tube where the piston was first inserted to reveal indentation(s) in the band caused by the U-cup. Inspect the band and cut to remove all indentations.

5. TRIM SEALING BAND

With a razor blade, remove rubber from extended band until flush with the end of tube. With tin snips, trim band to length indicated.

Cylinder Size	*Trim Length From Tube*
1" (25 mm)	.656" (16.7 mm) (Tolerance of +/- .032")

6. INSTALL HEADS

Lubricate and install new O-Rings (#8) onto Heads (#1, #15). Remove Cushion Needle Valve (#6) and lubricate and install new O-Rings (#5) onto Cushion Needle Valves. Insert Cushion Needle Valves (#6) back into Heads (#1, #15). Insert Heads into Tube (#14) using a slight rocking motion. DO NOT TWIST. Twisting the Head during installation may cut the O-Ring resulting in excessive leakage during operation.

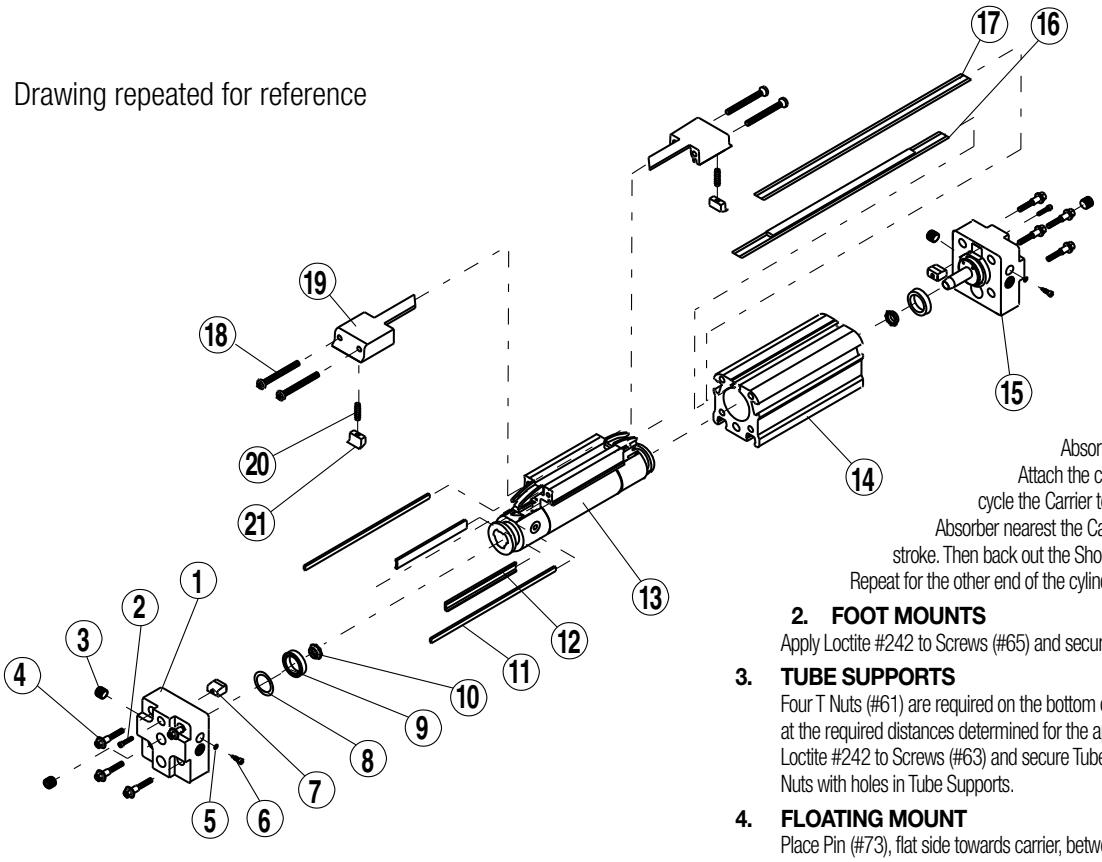
NOTE: When inserting heads, make sure band does not get pushed backwards into tube. Rubber on band must remain flush to the tube after head installation.

Install Head Bolts (#4) into Heads (#1, #15). (†When replacing the head bolts in actuators manufactured prior to July 1, 2006, the hole for the head bolt will need to be drilled 0.4" [10mm] deeper to accommodate the longer screw length.)
Torque Head Bolts (#4) to 100-110 in.-lbs (11.30-12.43 Nm).

7. SINGLE END PORT HEADS (Optional)

Grease and install O-Ring into gland. Procedure is now the same as for standard Heads.

Drawing repeated for reference



DISCONTINUED PRODUCT STYLE OR SIZE. PARTS SHEET IS FOR REPAIR USE ONLY.

1. SHOCK ABSORBERS

Using Loctite #242 screw Impact Bolts (#70) into Shock Stop Plate (#71) and Shock Stop Plate onto Carrier. Secure Shock Mounting Plate (#69) to Heads with SHCS (#67) and Loctite #242. Screw the Shock Absorber (#68) into the Shock Mounting Plate. Attach the cylinder to air lines and under low pressure cycle the Carrier to one end of the cylinder. Adjust the Shock Absorber nearest the Carrier to bottom out the Shock at its fullest stroke. Then back out the Shock one full turn and tighten the Jam Nut. Repeat for the other end of the cylinder.

2. FOOT MOUNTS

Apply Loctite #242 to Screws (#65) and secure Foot Mount (#64) to each Head.

3. TUBE SUPPORTS

Four T Nuts (#61) are required on the bottom of Tube. Tube Supports should be secured at the required distances determined for the application to prevent Tube deflection. Apply Loctite #242 to Screws (#63) and secure Tube Supports (#62) to tube aligning holes in T Nuts with holes in Tube Supports.

4. FLOATING MOUNT

Place Pin (#73), flat side towards carrier, between the two center holes as shown. Place Floating Mount Clamp (#74) over pin and secure to the Carrier with Screws (#75) and Loctite #242. Place Floating Mount Bracket (#76) over pin.

5. SWITCHES

NOTE: Form A Reed Switches should not be used in TTL logic circuits. A voltage drop caused by the L.E.D. indicator will result.For applications where TTL circuits are used, please contact the factory.

WARNING: An ohmmeter is recommended for testing Reed Switches. NEVER use an incandescent light bulb as a high current rush may damage the switch.

Reed and TRIAC switches are only recommended for signalling position, not directly powering soleniods. For shifting a solenoid, a relay or resistor is recommended between it and the Reed Switch. Switch ratings must not be exceeded at any time.

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8. INSTALL DUST BAND

Clean Dust Band (#17) thoroughly with a clean cloth. Remove any rubber residue on the solid steel surface with a razor blade. Strip rubber from steel on end of Dust Band (#17) flush with the end of the Tube. With a tin snips, trim Band to the proper length.

Cylinder Size	*Trim Length From Tube*
1" (25 mm)	.656" (16.7 mm) (Tolerance of +/- .032")

Insert trimmed Band into Head. Position Band above Band Clamp (#7). Tighten screw (#2) and press into groove in Tube.

9. INSTALL END CAPS

Lightly lubricate the Band Wiper (#21). Place a Spring (#20) into the hole of the Band Wiper and insert the Band Wiper into the End Cap (#19). Compress the Band Wiper and insert the End Cap onto the Carrier (#13). While pressing down on the End Cap tighten End Cap fasteners (#18).

NOTE: The top surface of the End Cap must be below the top surface of the Carrier.

Work the slack out of both the Sealing Band (#16) and Dust Band (#17) by moving the Carrier by hand, from the Head with the Bands retained to the opposite Head. Trim rubber, cut to length and secure the free end of Bands as described in steps 5 and 8.

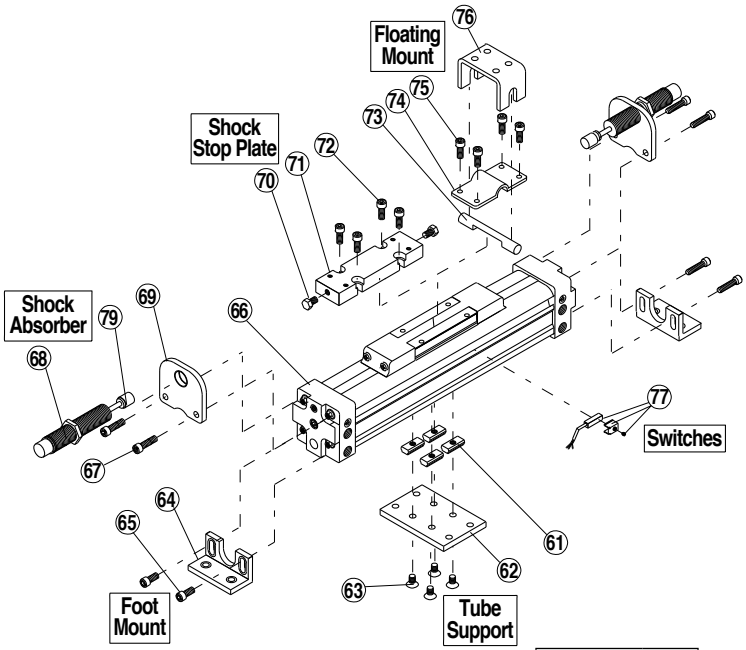
CAUTION: Improper cut length of Band may introduce slack into Band when free end is secured.

10. CHECK ASSEMBLY

Run the Carrier (#13) back and forth along the full stroke to make certain the cylinder is properly assembled before applying air. Before mounting cylinder back in application, check the cylinder's internal cushions. (If optional shock absorber kits are being used, this step can be eliminated as Cushion Seals (#10) were not installed.) Push the Carrier (#13) to one end. You should feel the Cushion decelerate the Carrier before the Cushion bottoms out. If the Carrier slams into the end of the cylinder, either the Cushion Seals have not been properly installed or the Cushion Needle Valve (#6) is adjusted too far out.

11. REMOUNT THE CYLINDER ONTO MACHINERY

OPTIONAL ACCESSORY ASSEMBLY INSTRUCTIONS



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ITEM	PART NO.	DESCRIPTION	QTY. BC410 U.S. Standard	QTY. BC4M10 Metric Taper Rc Heads	QTY. BC4M10 Metric Parallel G Heads
TUBE SUPPORTS[1]					
KIT[1]	6910-9002	Tube Support Kit[1] US Standard	A/R	–	–
	7910-9002	*Tube Support Kit[1] Metric*	–	*A/R*	*A/R*
61	3410-1013	T-Nut US Std.	4	–	–
	4410-1013	*T-Nut Metric*	–	*4*	*4*
62	6910-1013	Bracket, Tube Support	1	1	1
63	6910-1022	Flat Head Screw	4	–	–
	4410-1016	*Flat Head Screw (Metric)*	–	*4*	*4*
FOOT MOUNT					
KIT[2]	6910-9003	Foot Mount Kit[2] US Standard	A/R	–	–
	7910-9003	*Foot Mount Kit[2] Metric*	–	*A/R*	*A/R*
64	6910-1066	Foot Mount	2	2	2
65	0915-1016	Socket Head Screw	2	–	–
	4910-1004	*Socket Head Screw (Metric)*	–	*2*	*2*
SINGLE END PORTING					
66	6910-9018	Head Assy, Single End Prtg	1	–	–
	7910-9006	*Head Assy, Single End Prtg*	–	*1*	–
	8910-9002	*Head Assy, Single End Prtg*	–	–	*1*
SHOCK ABSORBERS[5]					
KIT[3]	6910-9024	Shock Mount Kit[3] (Hardware Only) US Standard	A/R	–	–
	7910-9024	*Metric*	–	*A/R*	*A/R*
KIT[4]	6910-9020	Shock Absorber Kit[4] Heavy Duty US Standard	A/R	–	–
	7910-9020	*Metric*	–	*A/R*	*A/R*
	6910-9005	Light Duty US Standard	A/R	–	–
	7910-9005	*Metric*	–	*A/R*	*A/R*
67	0707-1010	Socket Head Screw	4	–	–
	4910-1004	*Socket Head Screw (Metric)*	–	*4*	*4*
68	0910-1480	Heavy Duty Shock	1	–	–
	4910-1338	*Heavy Duty Shock (Metric)*	–	*1*	*1*
	0910-1479	Light Duty Shock	1	–	–
	4910-1337	*Light Duty Shock (Metric)*	–	*1*	*1*
69	6910-1017	Shock Mounting Plate US Standard	1	–	–
	7910-1017	*Metric*	–	*1*	*1*
70	6910-1024	Shock Impact Bolt	2	2	2
71	6910-1019	Shock Stop Plate US Standard	1	–	–
	7910-1019	*Metric*	–	*1*	*1*
72	0915-1016	Socket Head Screw	4	–	–
	4910-1004	*Socket Head Screw (Metric)*	–	*4*	*4*
FLOATING MOUNT					
KIT	6910-9004	Floating Mount Kit US Standard	1	–	–
	7910-9004	Floating Mount Kit Metric	–	1	1
73	6910-1021	Floating Mount Pin	1	1	1
74	6910-1059	Floating Mount Clamp	1	1	1
75	0801-1198	Socket Head Screw	4	–	–
	6910-1060	*Socket Head Screw (Metric)*	–	*4*	*4*
76	6910-1020	Floating Mount Bracket	1	1	1
SWITCHES					
77		**CONFIG. CODE ORDERING** (Mounting Hardware & FE conn. included)			
		CODE / **DESCRIPTION**: BT Switch Kit, Reed, Form C, 5m; BM Switch Kit, Reed, Form C, Male Conn.; RT Switch Kit, Reed, Form A, 5m; RM Switch Kit, Reed, Form A, Male Conn.; CT Switch Kit, Triac, 5m; CM Switch Kit, Triac, Male Conn.; KT Switch Kit, Hall-effect, Sinking, 5m; KM Switch Kit, Hall-effect, Sinking, Male Conn.; TT Switch Kit, Hall-effect, Sourcing, 5m; TM Switch Kit, Hall-effect, Sourcing, Male Conn.			
		NOTE: When ordered female connector & all mounting hardware is included			
79	0510-1018	Shock Stop Spacer	2	2	2

Service Parts Ordering NOTES:

1 A minimum of 2 (two) Tube Supports required per cylinder

2 Foot Mount Kit contains two foot mount brackets and mounting hardware

3 Shock Mount Kit contains one set of mounting hardware only

4 Shock Absorber Kit contains one Shock Absorber and mounting hardware

5 Standard end-of-stroke shock absorbers are designed to operate without the assistance of the standard band cylinder cushion. To ensure proper shock absorber performance, make sure the air cushion is disabled.

A/R = As Required

Switch Ordering NOTES:

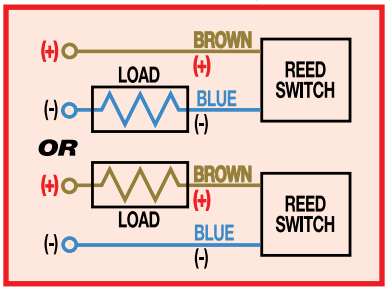
To order field retrofit switch and hardware kits for all Tolomatic actuators: SW (Then the model and bore size, and type of switch required)

Example: SWBC410RT

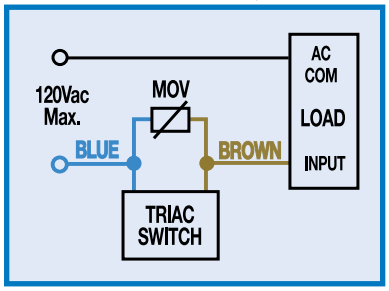
(Hardware and Form A Reed switch with 5 meter lead for 1" bore BC4 band cylinder)

WIRING DIAGRAMS

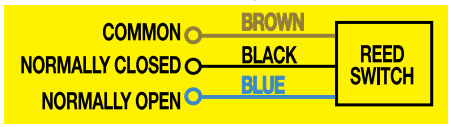
RT & RM DC REED, FORM A



CT & CM AC REED, TRIAC

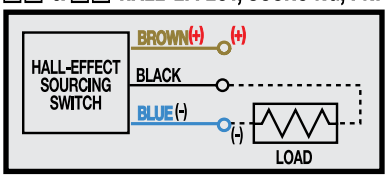


BT & BM DC REED, FORM C

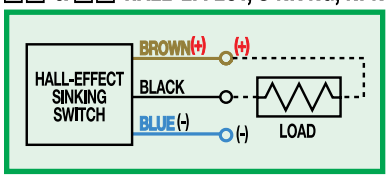


Some actuators may require switch mounting on a specific side of the assembly. Call Tolomatic for details.

TT & TM HALL-EFFECT, SOURCING, PNP



KT & KM HALL-EFFECT, SINKING, NPN

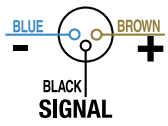


INSTALLATION INFORMATION

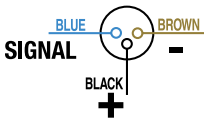
THE NOTCHED FACE OF THE SWITCH INDICATES THE SENSING SURFACE AND MUST FACE TOWARD THE MAGNET.

REPLACEMENT OF QD SWITCHES MANUFACTURED BEFORE JULY 1, 1997: It will be necessary to replace or rewire the female end coupler.

CURRENT
Quick disconnect Wiring



OLD
Quick disconnect Wiring



Female Connector 5M

LUBRICATION AND MAINTENANCE

All Tolomatic BC4 Band Cylinders are prelubricated at the factory. To ensure maximum cylinder life, the following guidelines should be followed.

1. Filtration

We recommend the use of dry, filtered air in our products. "Filtered air" means a level of 10 Micron or less. "Dry" means air should be free of appreciable amounts of moisture. Regular maintenance of installed filters will generally keep excess moisture in check.

2 External Lubricators (optional)

The factory prelubrication of Tolomatic Band Cylinders will provide optimal performance without the use of external lubrication. However, external lubricators can further extend service life of pneumatic actuators ***if*** the supply is kept constant.

Oil lubricators, (mist or drop) should supply a minimum of 1 drop per 20 standard cubic feet per minute to the cylinder. As a rule of thumb, double that rate if water in the system is suspected. Demanding conditions may require more lubricant.

If lubricators are used, we recommend a non-detergent, 20cP @ 140˚F 10-weight lubricant. Optimum conditions for standard cylinder operation is +32˚ to +150˚F (+0˚ to 65.5˚C).

NOTE: Use of external lubricators may wash away the factory installed lubrication. External lubricants must be maintained in a constant supply or the results will be a dry actuator prone to premature wear.

3. Sanitary environments

Oil mist lubricators must dispense "Food Grade" lubricants to the air supply. Use fluids with ORAL LD50 toxicity ratings of 35 or higher such as Multitherm® PG-1 or equivalent. Demanding conditions can require a review of the application.

4. Bearing lubrication

The bearing system is prelubricated at the factory with a high quality RheoGel TEK664 grease. Relubrication is recommended every .5-1 million cycles using RheoGel TEK664 grease.

5. Cushion Adjustment

Adjust the cushion needles in the cylinder heads carefully to obtain a smooth, hesitation free deceleration for your particular application. If there are questions on proper adjustment, please consult Tolomatic, Inc.

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Tolomatic™
EXCELLENCE IN MOTION

COMPANY WITH QUALITY SYSTEM CERTIFIED BY DNV GL = ISO 9001 =

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Phone: (763) 478-8000 • Fax: (763) 478-8080 • Toll Free: 1-800-328-2174

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