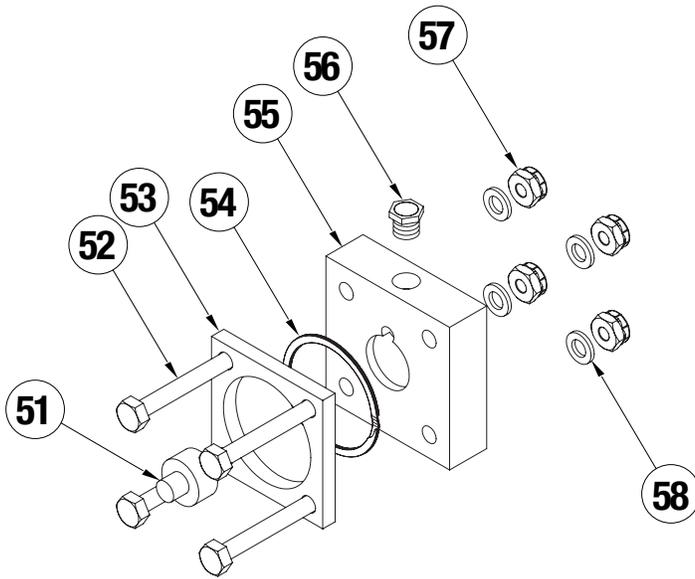




Single Action Option



ITEM	PART NO.	DESCRIPTION	QTY
51.	1004-1226	RUBBER BUMPER	1
52.	1004-1225	END CAP FASTENER	4
53.	1004-1034	CLAMP PLATE	1
54.	1004-1036	RETENTION RING	1
55.	1004-1224	END CAP	1
56.	0768-1022	BREATHER	1
57.	1004-1013	LOCK NUT	4
58.	10041-144	WASHER	4

**INSTALLATION**

When unpacking a Tolomatic cable cylinder, BE EXTRA CAREFUL NOT TO SCRATCH OR MAR THE NYLON COVERING ON THE CABLE. The cylinder may be mounted using the bolt holes in the head. When attaching the cable bracket to the driven mechanism, be sure it is in perfect alignment and that it does not deflect the cable to the side. Misalignment can cause excessive wear.

Pre-tensioning and proof-loading instructions: All double-acting cable cylinders are shipped without being pre-tensioned. They must be pre-tensioned after mounting to insure maximum service life of the device. There are two types of stretch in cable— constructional and elastic. The constructional stretch is removed by proof-loading of the cable. The elastic stretch is removed by proper pre-tensioning of the cable.

**Proof-loading of cables (for cylinders without Auto Tensioners)**

1. Tighten the bracket terminal lock nuts equally with a torque wrench to torque requirements listed in Table A.
2. Let set for 30 seconds.
3. Loosen lock nuts to remove tension. (But leave them tight enough to eliminate any slack.)
4. Follow Pre-tensioning Instructions.

MODEL	REQUIRED TORQUE
CC15	45 IN-LBS (5.08 N-M)

**Pre-tensioning of cables:**

1. Block the load some distance from the end of travel to keep cylinder from bottoming.
2. Apply pressure that is 15-20 percent higher than actual load pressure needed to move the load.

**NOTE:** Load pressure is defined as the actual pressure required to move the load. When the load is stopped externally before the piston bottoms, the relief valve or regulator setting becomes the load pressure.

When pressurized, one cable becomes tight and the other becomes slack. Manually adjust out the slack. Release the pressure. Block the load on the opposite side and pressurize the other port. Repeat the manual adjustment on the other cable. Release pressure and remove blocks. Return the regulator or relief valve to the original load pressure.

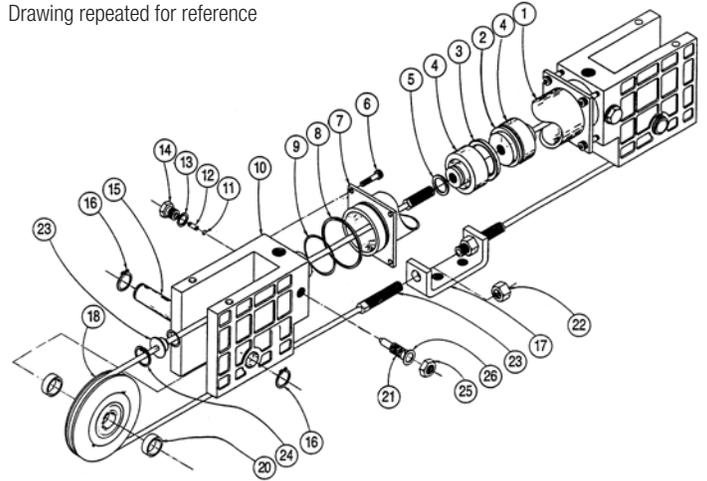
The cylinder is now pre-tensioned. Additional manual adjustment should not be required. It is suggested however, that the cables be checked periodically.

**Alternate Method:** If the load cannot be blocked for cable pre-tensioning as stated above, tighten the bracket terminal lock nuts with a torque wrench to total pre-tensioning torque as stated in Table B.

MODEL	PRE-TENSIONING TORQUE	+	STARTING TORQUE OF TERMINAL NUTS	=	TOTAL PRE-TENSIONING TORQUE
CC15	8.0 IN-LBS	+	20.0 IN-LBS	=	28.0 IN-LBS
	0.904 N-M	+	2.26 N-M	=	3.164 N-M

**NOTE:** For cylinders with Auto Tensioners, the cables must be proof-loaded and pre-tensioned before pressure is applied to the AT unit.

Drawing repeated for reference



**TO REBUILD THE CYLINDER**

1. Remove cylinder from machinery.
2. Disconnect Cable (#22) from the Clevis (#17) and remove Pulleys (#18) on both ends of the cylinder.
3. Remove internal retaining rings (#8) from both heads and remove one head from cylinder by removing the four Socket Head Cap Screws (#6)
4. Pull Piston (#2) towards the open tube end and remove from Tube (#1).
5. Disconnect Cables (#22) from Piston (#2) and pull back through the Heads (#10) to remove them.
6. Install new U-cups (#3) and Quad-rings (#5) on Piston (#2) and rethread new Cables (#22) through Heads (#10), and connect them to the Piston (#2).
7. Being careful not to damage the cable, lubricate and install the Gland Seals on the Cable Assembly (#22) in the Heads (#10), and reinstall the retaining rings (#23).
8. Push the Piston (#2) back into Tube (#1) by gently tucking in the U-cup (#3) with a screwdriver or pencil. Mount head back on cylinder with socket head cap screws (#6). Replace the Pulleys (#18) and connect cable (#22) to the clevis (#17).
9. Operate cylinder back and forth by hand several times to be sure it is properly assembled before reconnecting air or hydraulic service.
10. Reinstall cylinder on machinery.

**IMPORTANT NOTE: Apply (Blue) Loctite® #242 or equivalent to threaded cable terminal before connecting to the piston.**

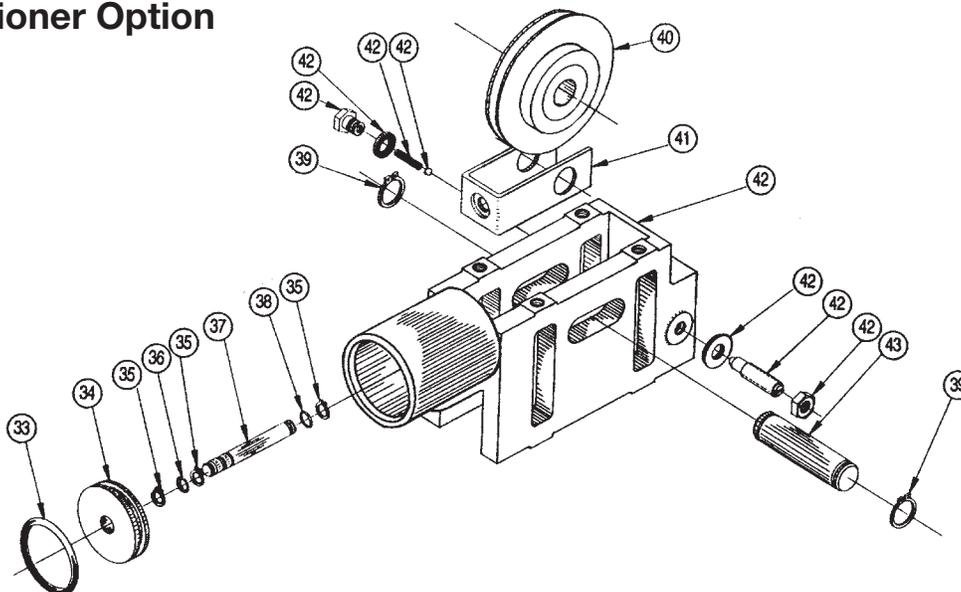
**MAINTENANCE**

Keep the cylinder as clean as possible around pulleys, glands, etc. Pneumatic service should be adequately lubricated with SAE 10 or 20 grade non-detergent oil.

Pulleys have permanently lubricated bearings and will require no maintenance. Check the cylinder's cables periodically to help prevent premature or unexpected failures.

Your Tolomatic Cable Cylinder will give you many cycles of trouble free service. However, should a leak occur, a rebuilding kit may be obtained which enables you to replace all the seals in a cylinder to return it to normal operating condition.

### Auto Tensioner Option



ITEM	PART NO.	DESCRIPTION	QTY.
<b>AUTO TENSIONER</b>			
33.	1001-1075	O-RING	1
34.	1001-1165	TENSIONER PISTON	1
35.	1001-1255	RETAINING RING	3
36.	0720-1003	O-RING	1
37.	1001-1213	TENSIONER PISTON ROD	1
38.	1001-1021	O-RING	1
39.	1004-1056	RETAINING RING	2
40.	1004-1409	PULLEY	1
41.	1004-1347	TIE PLATE ASSEMBLY	1
*42.	1004-9302	TENSIONER HEAD ASSEMBLY (SINGLE-PORT)	1
	1004-1306	TENSIONER HEAD ASSEMBLY (3-PORT)	1
43.	1004-1052	PULLEY SHAFT	1

\*Indicates check valve components used only in the single ported head.

#### AUTO TENSIONER OPTION

All cable cylinder models with Auto Tensioner units should be plumbed with a separate, non-fluctuating pressure source which is a set percentage of the actual operating pressure.

BORE SIZE (IN.)	% OF LOAD PRESSURE
0.75	22%
1.0	40%
1.5	86%
2.0	32%
2.0 (500 PSI)	24%
2.5	51%
3.0	54%
4.0	96%
5.0	75%
6.0	57%
8.0	102%

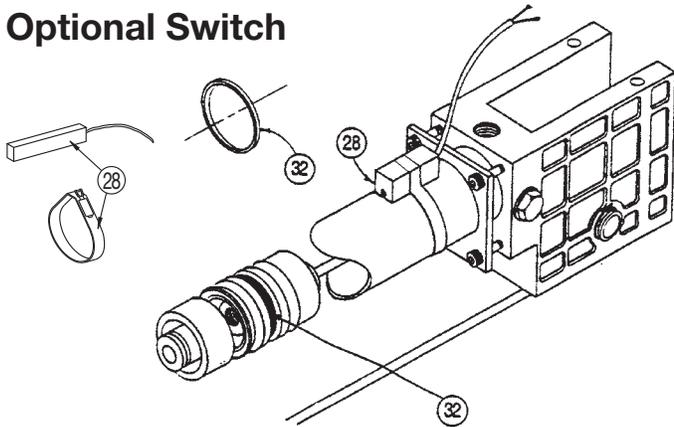
In the above table, load pressure is defined as the pressure required to move the load, NOT the regulated pressure (pneumatic) or the relief valve setting (hydraulic).

**NOTE:** If the load will be stopped mechanically prior to the piston bottoming, then the regulator pressure or the relief valve setting must be considered to be the load pressure.

If the application is hydraulic, a pressure-reducing valve must be used to ensure a non-fluctuating pressure source to the tensioner(s) or the pressure source must be an independent circuit that will maintain the required differential.

When installing cable cylinder models with Auto tensioner units, take up the cable slack manually according to the pretensioning instructions under General Installation and Maintenance.

Optional Switch



ITEM	PART NO. OR CONFIG. CODE	DESCRIPTION	QTY.
<b>SWITCH KIT</b>			
28.	BT	SWITCH KIT, REED, FORM C, 5M	A/R
	BM	SWITCH KIT, REED, FORM C, MALE CONN.	A/R
	RT	SWITCH KIT, REED, FORM A, 5M	A/R
	RM	SWITCH KIT, REED, FORM A, MALE CONN.	A/R
	CT	SWITCH KIT, TRIAC, 5M	A/R
	CM	SWITCH KIT, TRIAC, MALE CONN.	A/R
Mounting hardware & fe conn. Included <b>Note:</b> When ordered female connector & all mounting hardware is included			
32.	1004-1338	MAGNET	1

To Order Retrofit Kits

All Switch Kits come with 1 switch and mounting hardware.

Retrofit ordering method: **SW**

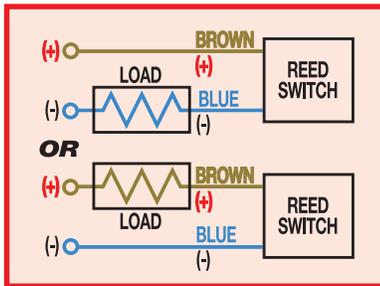
**EXAMPLE:** **SW** **CC** **15** **RT**

Switch Kit      Model      Size      Switch Type Code

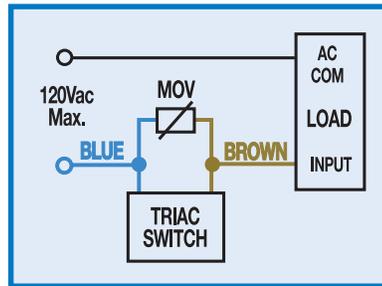
Hardware and Form A Reed switch with 5 meter lead for 1.5" bore Cable cylinder

WIRING DIAGRAMS

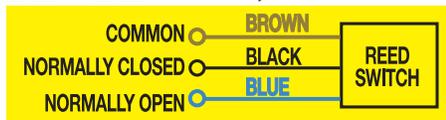
**RT** & **RM** DC REED, FORM A



**CT** & **CM** AC REED, TRIAC

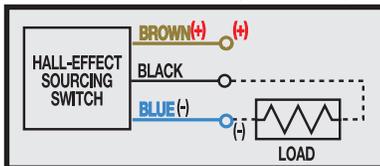


**BT** & **BM** DC REED, FORM C

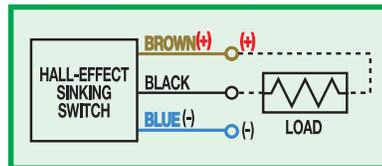


Some actuators may require switch mounting on a specific side of the assembly. Call Tolomatic for details.

**TT** & **TM** HALL-EFFECT, SOURCING, PNP



**KT** & **KM** HALL-EFFECT, SINKING, NPN

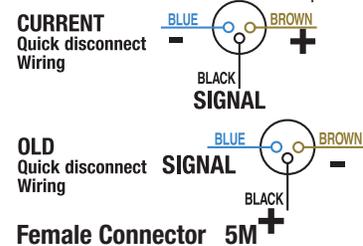


INSTALLATION INFORMATION



**⚠**  
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.



3800 County Road 116, Hamel, MN 55340 USA  
 http://www.Tolomatic.com • Email: Help@Tolomatic.com  
 Phone: (763) 478-8000 • Fax: (763) 478-8080 • Toll Free: 1-800-328-2174

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