Tolomatic™
EXCELLENCE IN MOTION

Parts Sheet

1001-4004_10

Replaced #1001–0209, # 1001–0237 & #1900–0200

Cable Cylinder

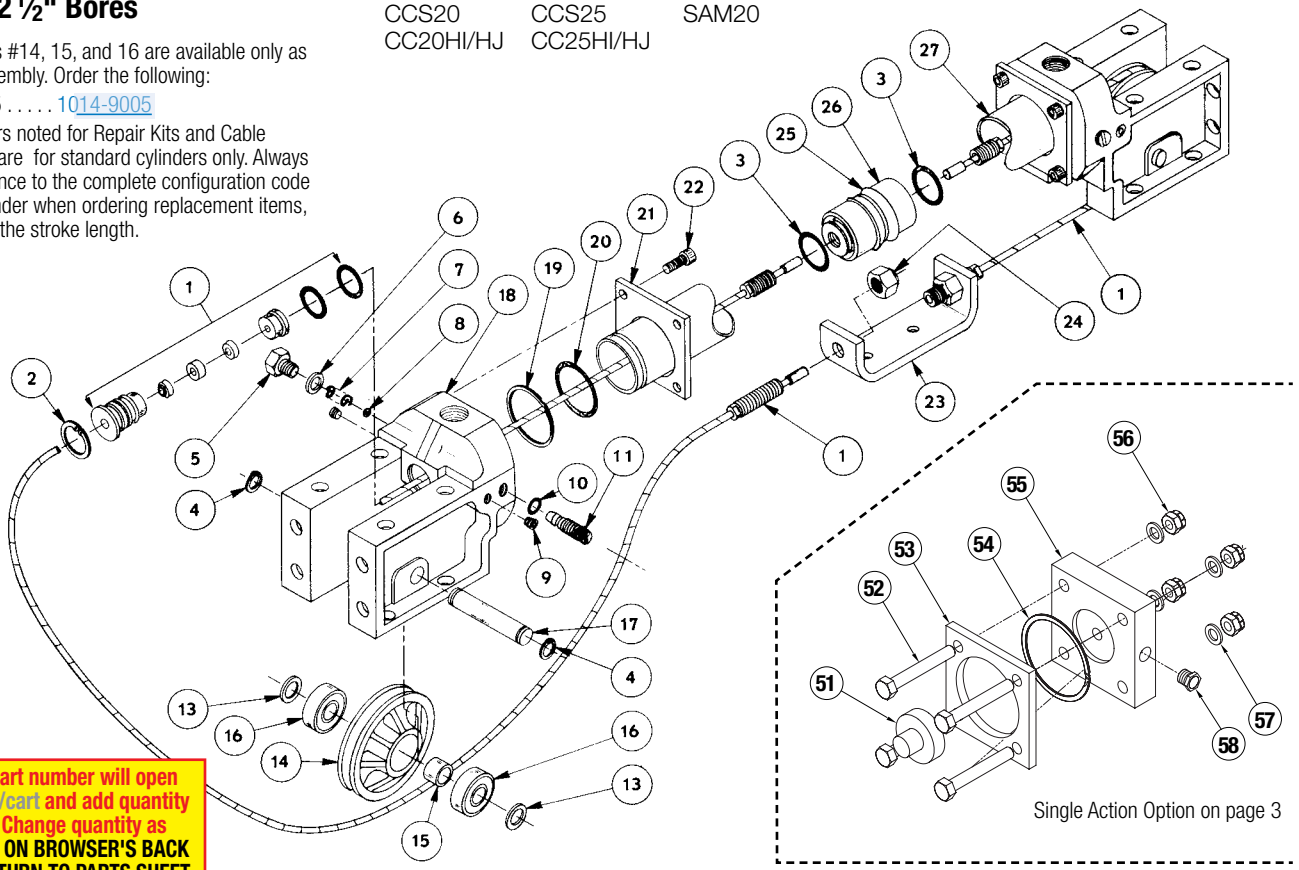
2" and 2½" Bores

MODELS: CC20, CCM20, CCS20, CC20HI/HJ, CC25, CCM25, CCS25, CC25HI/HJ, SA20, SAS20, SAM20

NOTE: Items #14, 15, and 16 are available only as a Pulley Assembly. Order the following:

CC20, CC25 1014-9005

Part Numbers noted for Repair Kits and Cable Assemblies are for standard cylinders only. Always make reference to the complete configuration code on your cylinder when ordering replacement items, also specify the stroke length.



Single Action Option on page 3

Clicking on part number will open tolomatic.com/cart and add quantity of 1 to cart. Change quantity as needed. CLICK ON BROWSER'S BACK BUTTON TO RETURN TO PARTS SHEET.

Click on Part No. to Add to Cart

ITEM	PART NO. OR CONFIG. CODE	DESCRIPTION	QUANTITY CC20	CCM20	CCS20	CC25	CCM25	CCS25
[2,3]1.	CACC20SK_	CABLE ASSEMBLY	2		2			
	CACCM20SK_	CABLE ASSEMBLY W/ MAGNET OPT.		2				
	CACC25SK_	CABLE ASSEMBLY				2		2
	CACCM25SK_	CABLE ASSEMBLY W/ MAGNET OPT.					2	
2.	1014-1023	RETAINING RING	2	2	2	2	2	2
[3]3.	1014-1063	O-RING, BUNA-N MATERIAL	2	2	2	2	2	2
	1014-1016	O-RING, VITON® MATERIAL	2	2	2	2	2	2
4.	1004-1056	EXTERNAL RETAINING RING	4	4	4	4	4	4
5.	1014-1045	SCREW	2	2	2	2	2	2
6.	1014-1048	GASKET	2	2	2	2	2	2
7.	1014-1046	SPRING	2	2	2	2	2	2
8.	1014-1047	CHECK BALL	2	2	2	2	2	2
9.	1014-1065	PLUG PIPE	4	4	4	4	4	4

Click on Part No. to Add to Cart

ITEM	PART NO. OR CONFIG. CODE	DESCRIPTION	QUANTITY CC20	CCM20	CCS20	CC25	CCM25	CCS25
[3]10.	1014-1062	O-RING, BUNA-N MATERIAL	2	2	2	2	2	2
	1014-1078	O-RING, VITON® MATERIAL	2	2	2	2	2	2
11.	1014-1044	CUSHION NEEDLE	2	2	2	2	2	2
12.	1014-1050	JAM NUT	2	2	2	2	2	2
13.	1004-1053	PULLEY SPACER	4	4	4	4	4	4
14.	1014-1140	PULLEY	2	2	2	2	2	2
15.	1014-1137	BEARING SPACER	2	2	2	2	2	2
16.	1014-1138	BEARING	4	4	4	4	4	4
17.	1014-1052	PULLEY SHAFT	2	2	2	2	2	2
18.	1014-9004	HEAD ASSEMBLY, BUNA-N MATERIAL	2	2	2			
	1014-9023	HEAD ASSEMBLY, VITON® MATERIAL	2	2	2			
	1019-9004	HEAD ASSEMBLY, BUNA-N MATERIAL				2	2	2
	1019-9007	HEAD ASSEMBLY, VITON® MATERIAL				2	2	2

[2] Repair Kit (RK) & Cable Assembly (CA) ordering method:

Steel Tube[4] · Magnet[6] · Extra Cable[7]

□□ CC S V M □□ SK □□□□□ XA□

EXAMPLE: RK CC V M 20 SK 21·25 XA 9

Repair Kit — Model — Viton® Seals[5] — Size — Stroke Length

[3] Repair Kit (RK) includes: U-Cups, O-Rings, and Cable Assembly

[4] Steel tubes (S) are incompatible with switches and magnets.

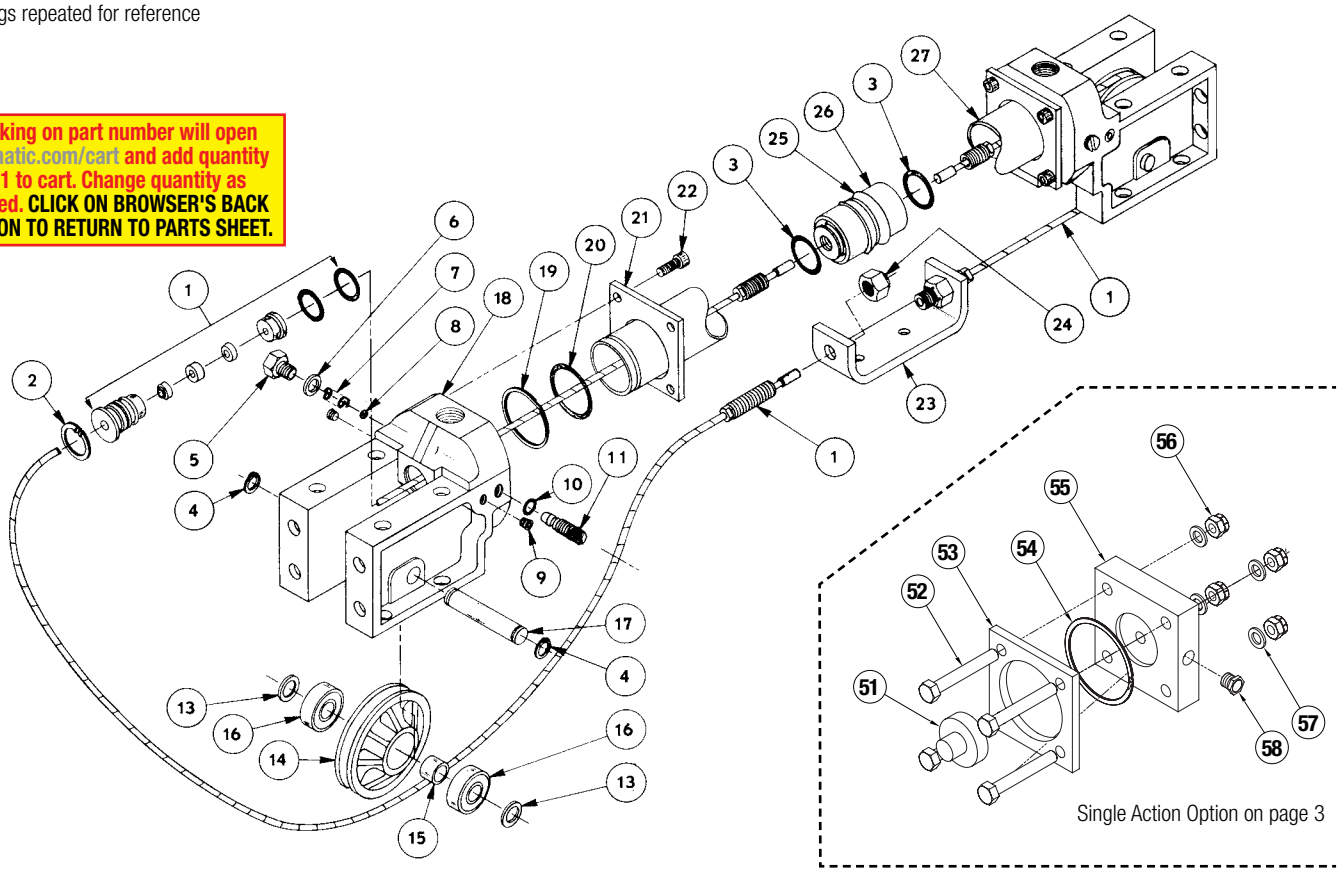
[5] V refers to optional seals of Viton® material.

[6] M is for optional switch magnet, which is required for switches to function. Since the Magnet Option adds length to the piston and the tube length, it must be included when ordering.

[7] XA & XB are for extra cable length [include addition cable required measured in decimal inches]

Drawings repeated for reference

Clicking on part number will open tolomatic.com/cart and add quantity of 1 to cart. Change quantity as needed. CLICK ON BROWSER'S BACK BUTTON TO RETURN TO PARTS SHEET.



Single Action Option on page 3

Click on Part No. to Add to Cart

ITEM	PART NO. OR CONFIG. CODE	DESCRIPTION	QUANTITY CC20	CCM20	CCS20	CC25	CCM25	CCS25
18.A	1014-1109	HEAD ONLY, 3 PORTED, ALUMINUM	2	2	2			
	1019-1053	HEAD ONLY, 3 PORTED, ALUMINUM				2	2	2
19.A	1014-1024	RETAINING RING	2	2	2			
	1019-1036	RETAINING RING				2	2	2
[3]20.	1014-1037	O-RING, BUNA-N MATERIAL	2	2	2			
	1014-1017	O-RING, VITON® MATERIAL	2	2	2			
	1019-1037	O-RING, BUNA-N MATERIAL				2	2	2
	1019-1009	O-RING, VITON® MATERIAL				2	2	2
21.	1014-1067	CLAMP RING	2	2	2			
	1019-1041	CLAMP RING				2	2	2
22.	1009-1065	SOCKET HEAD CAP SCREW	8	8	8	8	8	8
23.	1014-1057	BRACKET	1	1	1	1	1	1
24.	1014-1058	LOCK NUT	2	2	2	2	2	2
[3]25.	1014-1020	U-CUP, BUNA-N MATERIAL	2	2	2			
	1014-1000	U-CUP, VITON® MATERIAL	2	2	2			

Click on Part No. to Add to Cart

ITEM	PART NO. OR CONFIG. CODE	DESCRIPTION	QUANTITY CC20	CCM20	CCS20	CC25	CCM25	CCS25
[3]25.	1019-1020	U-CUP, BUNA-N MATERIAL				2	2	2
	1019-1021	U-CUP, VITON® MATERIAL				2	2	2
26.	1014-1040	PISTON	1		1			
	1014-1187	PISTON		1				
	1019-1040	PISTON				1		1
	1019-1115	PISTON					1	
[1]27.	RTBCC20SK_	ALUMINUM TUBE	AR					
	RBTCCM20SK_	ALUMINUM TUBE W/ MAGNET		AR				
	RTBCCS20SK_	STEEL TUBE			AR			
	RTBCC25SK_	ALUMINUM TUBE				AR		
	RTBCCM25SK_	ALUMINUM TUBE W/ MAGNET					AR	
	RTBCCS25SK_	STEEL TUBE						AR
28.	1014-1049	THREAD SEAL (USE W/ 1018–0067)	2	2	2	2	2	2
	1014-1049	THREAD SEAL (USE W/ 1023–0405)	2	2	2	2	2	2

Tube — Steel Tube[4] — Magnet[6] — Extra Cable[7]

[1] Replacement Tube ordering method: RTB CC S V M __ __ SK __ __ __ __ __ XA __

EXAMPLE: RTB CC V M 2 0 SK 2 1 · 2 5 XA 9

Repair Kit (RK) ordering method: RK CC S V M __ __ SK __ __ __ __ __ XA __

EXAMPLE: RK CC V M 2 0 SK 2 1 · 2 5 XA 9

Repair Kit — Model — Viton Seals[5] — Size — Stroke Length

[3] Repair Kit (RK) includes: Piston U-Cups, Quad Rings, O-Rings, Cable Assembly

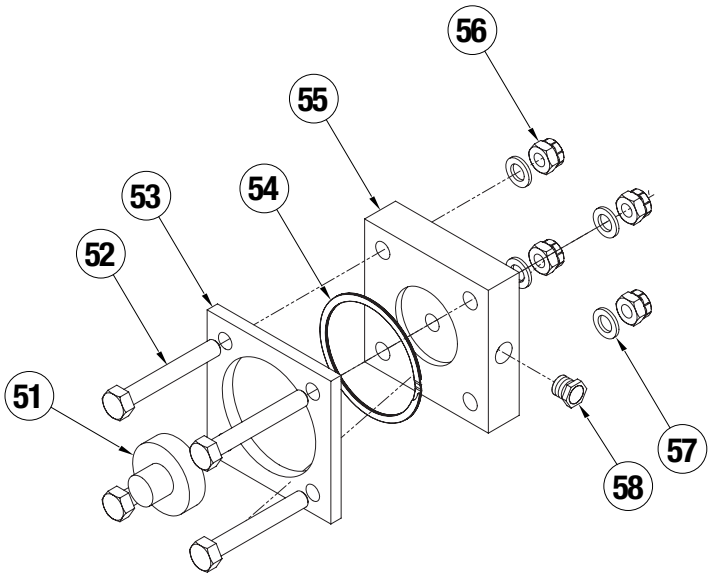
[4] Steel tubes (S) are incompatible with switches and magnets.

[5] V refers to optional seals of Viton® material.

[6] M is for optional switch magnet, which is required for switches to function. Since the Magnet Option adds length to the piston and the tube length, it must be included when ordering.

[7] XA & XB are for extra cable length [include addition cable required measured in decimal inches]

Single Action Option

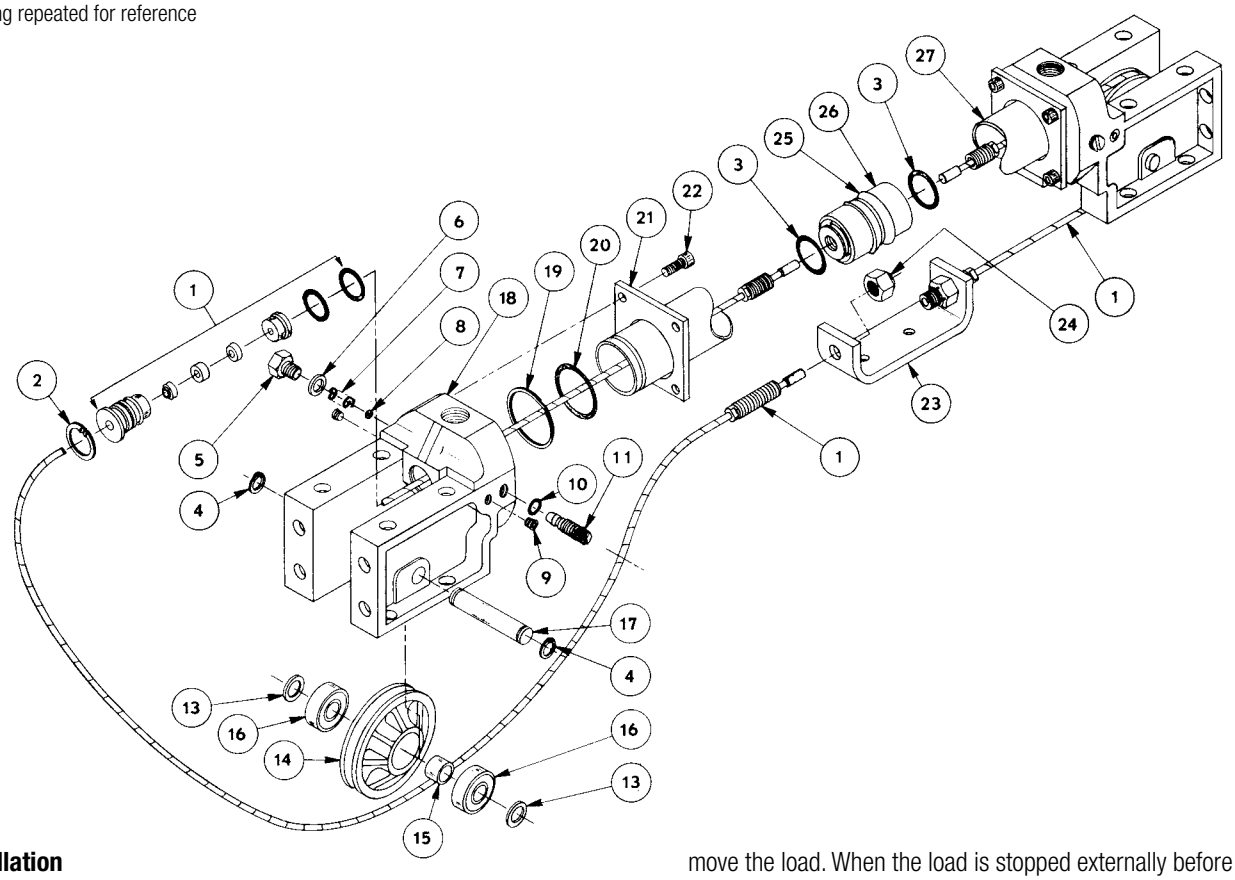


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Click on Part No. to Add to Cart

	PART NO.			
ITEM	SA20	SA25	DESCRIPTION	QTY
51.	1014-1099	1014-1099	RUBBER BUMPER	1
52.	1014-1100	1014-1100	END CAP FASTENER	4
53.	1014-1067	1019-1041	CLAMP PLATE	1
54.	1014-1024	1019-1036	RETENTION RING	1
55.	1014-1193	1019-1088	END CAP	1
56.	1051-1068	1051-1068	LOCK NUT	4
57.	0701-1007	0701-1007	WASHER	4
58.	0768-1022	0768-1022	BREATHER	1

Drawing repeated for reference



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 seal wear.

Pretensioning and proof-loading instructions: All double-acting cable cylinders are shipped without being pretensioned. They must be pretensioned 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 pretensioning 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 Pretensioning Instructions.

TABLE A: TORQUE TO PROOF-LOAD THE CABLE	
MODEL	**REQUIRED TORQUE**
CC20, CC25	115 INCH-POUNDS (12.99 NEWTON-METERS)

Pretensioning 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.

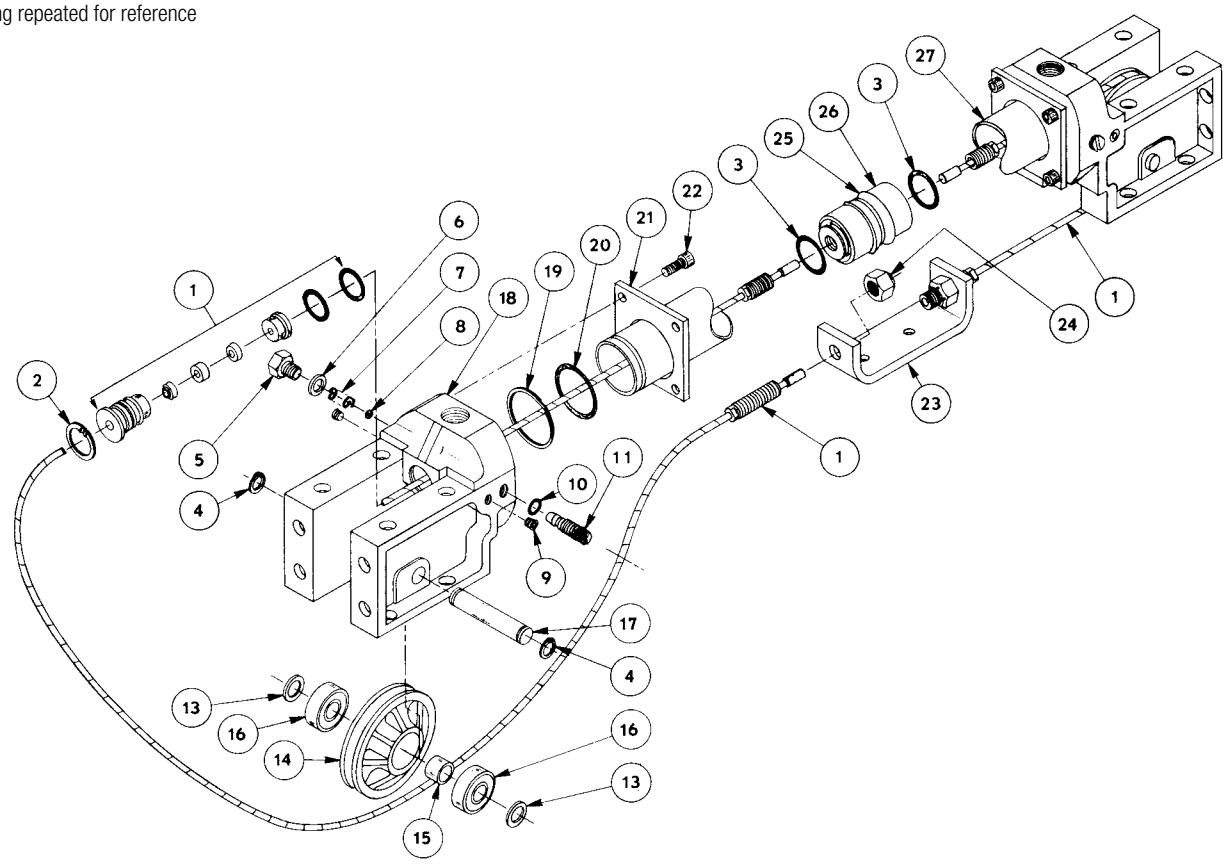
The cylinder is now pretensioned. Additional manual adjustment should not be required. It is suggested however, that the cables be checked periodically.

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

TABLE B: TORQUE FOR UNBLOCKABLE LOADS					
MODEL	**PRETENSIONING TORQUE**	**+**	**STARTING TORQUE OF TERMINAL NUTS**	**=**	**TOTAL PRETENSIONING TORQUE**
CC20	46.0 IN-LBS.	+	25.0 IN.-LBS.	=	71.0 IN.-LBS.
	5.2 N-M	+	*2.82 N-M*	=	*8.02 N-M*
CC25	73.0 IN-LBS.	+	25.0 IN.-LBS.	=	98.0 IN.-LBS.
	8.25 N-M	+	*2.82 N-M*	=	*11.07 N-M*

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

Drawing repeated for reference



TO REBUILD THE CYLINDER

1. Remove cable cylinder from machinery.
2. Disconnect Cable (1) from the Clevis (23) and remove Pulleys (14) on both ends of the cable cylinder.
3. Remove one Head (18) from cable cylinder by removing the four Cap Screws (22).
4. Pull Piston (26) towards the open tube end and remove from Tube (27).
5. Disconnect Cable Assembly (1) from Piston (26) and pull back through the Head assemblies (18) with their gland seals to remove them.
6. Install new U-cups (25) and O-rings (3) on Piston (26).
7. Being careful not to damage the cable, lubricate gland seals on the Cable Assembly (1) and install the gland seals in the Head assembly (18) and reinstall the Retaining Ring (2).
8. Push the Piston (26) back into Tube (27) by gently tucking in the U-cup (25) with a screwdriver or pencil. Mount head back on cylinder with Socket Head Cap Screws (22). Replace the Pulleys (14) and connect Cable Assembly (1) to Clevis (23).
9. Operate cable cylinder back and forth by hand several times to be sure it is properly assembled before reconnecting air or hydraulic service.
10. Reinstall cable cylinder on machinery.

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

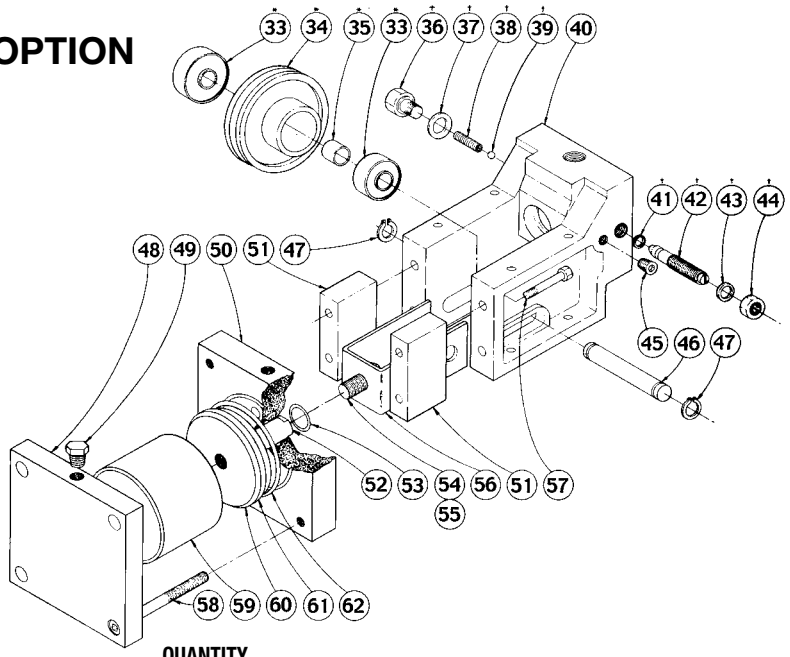
MAINTENANCE

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.

NOTE: Every Tolomatic Cable Cylinder has its stroke length indicated on the identification tag shipped with the cylinder. Refer to this stroke measurement when ordering replacement parts for the cable cylinder. Should the tag be missing, measure the length of the cylinder including the heads at both ends. If there are no switches present on the cylinder, check the piston for a magnet to see if it is a Reed Switch model. If it is, consult the Tolomatic Cable Cylinder catalog dimensional drawings for "stroke-plus" length and subtract 1.62 inches for cylinders with 1/2-inch 3/4-inch and 1-inch bores and .375 inches for all larger bore Reed Switch models to determine the stroke length.

AUTO TENSIONER OPTION



Clicking on part number will open tolomatic.com/cart and add quantity of 1 to cart. Change quantity as needed. CLICK ON BROWSER'S BACK BUTTON TO RETURN TO PARTS SHEET.

AUTO TENSIONER

Click on Part No. to Add to Cart

ITEM	PART NO.	DESCRIPTION	QUANTITY					
			CC20	CCM20	CCS20	CC25	CCM25	CCS25
33.	1014-1138	SEALED BALL BEARING	2	2	2	2	2	2
34.	1014-1140	PULLEY	1	1	1	1	1	1
35.	1014-1137	BEARING SPACER	1	1	1	1	1	1
63.	1014-9005	PULLEY ASSEMBLY	2	2	2	2	2	2
36.	1014-1045	HEX HEAD BOLT	1	1	1	1	1	1
37.	1014-1048	CHECK VALVE GASKET	1	1	1	1	1	1
38.	1014-1046	CHECK VALVE SPRING	1	1	1	1	1	1
39.	1014-1047	CHECK VALVE BALL	1	1	1	1	1	1
40.	1014-1108	TENSIONER HEAD	1	1	1			
	1014-1106	TENSIONER HEAD, 3-PORTED HEAD	1	1	1			
	1019-1043	TENSIONER HEAD				1	1	1
	1019-1113	TENSIONER HEAD, 3-PORTED HEAD				1	1	1
41.	1014-1062	O-RING, BUNA-N	1	1	1	1	1	1
42.	1014-1044	CUSHION ADJUSTMENT NEEDLE	1	1	1	1	1	1
43.	1014-1049	THREAD SEAL	1	1	1	1	1	1
44.	1014-1050	HEX HEAD JAM NUT	1	1	1	1	1	1
45.	1014-1065	PIPE PLUG	2	2	2	2	2	2
46.	1014-1052	PULLEY SHAFT	1	1	1	1	1	1
47.	1004-1056	RETAINING RING	2	2	2	2	2	2
48.	1014-1172	BACK PLATE	1	1	1	1	1	1
49.	0768-1022	HEX HEAD BREATHER PIPE PLUG	1	1	1	1	1	1
50.	1014-1173	FRONT TENSIONER PLATE	1	1	1	1	1	1
51.	1014-8011	SIDE SPACER	2	2	2	2	2	2
52.	1900-1005	PISTON SHAFT	1	1	1	1	1	1
53.	0701-1004	O-RING, BUNA-N	1	1	1	1	1	1
54.	1039-1045	HEX HEAD BOLT	1	1	1	1	1	1
55.	0774-1003	FLAT WASHER	1	1	1	1	1	1
56.	1014-8026	TIE PLATE	1	1	1	1	1	1
57.	1309-2021	CAP SCREW	4	4	4	4	4	4
58.	1900-1009	SOCKET HEAD CAP SCREW	4	4	4	4	4	4
59.	1900-1002	TENSIONER TUBE	1	1	1	1	1	1
60.	1900-1004	PISTON	1	1	1	1	1	1
61.	1014-1083	O-RING, BUNA-N	1	1	1	1	1	1
62.	1029-1037	O-RING, BUNA-N	1	1	1	1	1	1

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%
1.00	40%
1.50	86%
2.00	32%
2.00 (500 PSI)	24%

BORE SIZE (IN.)	% OF LOAD PRESSURE
2.50	51%
3.00	54%
4.00	96%
5.00	75%
6.00	57%
8.00	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

AUTO TENSIONER KITS

Click on Part No. to Add to Cart

ITEM	PART NO.	DESCRIPTION	QUANTITY					
			CC20	CCM20	CCS20	CC25	CCM25	CCS25
	1014-9012	TENSIONER KIT ASSEMBLY CC20	1	1	1	–	–	–
	1014-9134	TENSIONER KIT ASSEMBLY CC20, 3 PORTED HEAD	1	1	1	–	–	–
	1019-9005	TENSIONER KIT ASSEMBLY CC25	–	–	–	1	1	1

REED 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 Tolomatic.

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 switch. Switch ratings must not be exceeded at any time

	CONFIG. CODE ORDERING MOUNTING HARDWARE & FE CONN. INCLUDED	
ITEM	**CODE**	**DESCRIPTION**
19.	BT	SWITCH KIT, REED, FORM C, 5M
	BM	SWITCH KIT, REED, FORM C, QD MALE CONN.
	RT	SWITCH KIT, REED, FORM A, 5M
	RM	SWITCH KIT, REED, FORM A, QD MALE CONN.
	CT	SWITCH KIT, TRIAC, 5M
	CM	SWITCH KIT, TRIAC, QD MALE CONN.

NOTE: When ordered female connector & all mounting hardware is included

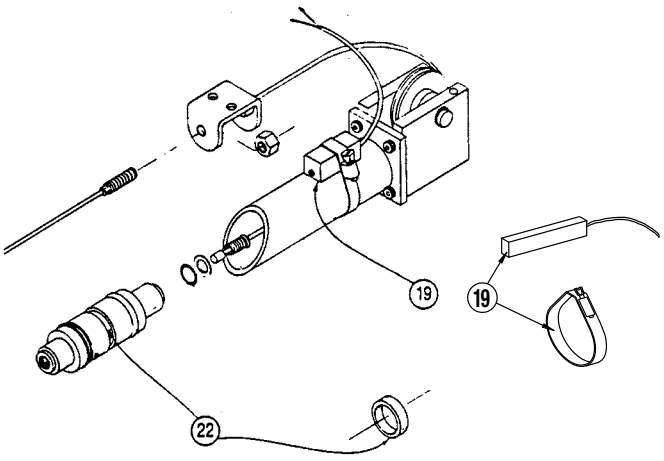
To Order Retrofit Kits

All Switch Kits come with 1 switch and mounting hardware.

Retrofit ordering method: SW ☐☐ ☐☐ ☐☐ ☐☐

EXAMPLE: SW CC 20 RT

Switch Kit — Model — Size — Switch Type Code

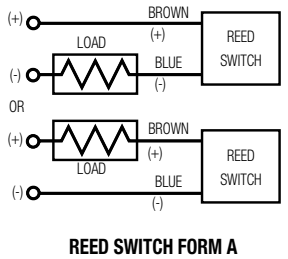


Click on Part No. to Add to Cart

ITEM	PART NO.	DESCRIPTION	QUANTITY CC20, SA20	CCS20, SAS20	CCM20, SAM20	CC25, SA25	CCS25, SAS25	CCM25, SAM25
22.	1014-1188	MAGNET			1			
	1019-1116	MAGNET						1

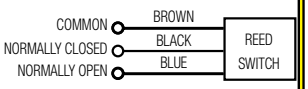
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Universal Switch Wiring Diagrams and Label Color Coding

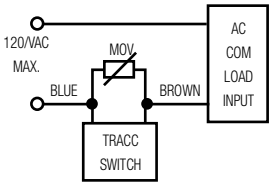


REED SWITCH FORM A
LABEL COLOR: RED
10VA MAX. 200 VDC
500MA MAX. CURRENT

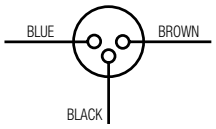
NOTE: The side of the switch with the groove indicates the sensing surface. This must face toward the magnet.



REED SWITCH FORM C
LABEL COLOR: YELLOW
120 VDC/120 VAC MAX.
250MA MAX. CURRENT



TRIAC SWITCH
LABEL COLOR: BLUE
MAX. 1AMP. CONT. CURRENT @ 86°F
MAX. .5AMP. CONT. CURRENT @ 140°F
PEAK SURGE CURRENT 10AMP.



QUICK-DISCONNECT (APPLIES TO ALL SWITCH TYPES)

An Important Note Regarding Field Retrofit of Quick-Disconnect Couplers:
If replacing a Quick-Disconnect switch manufactured before 7-1-97 it will also be necessary to replace or rewire the female-end coupler with the in-line splice

Female Connector 5M

For complete Reed and TRIAC Switch Performance Data, refer to the Tolomatic Pneumatic Products Catalog.

Loctite® is a registered trademark of the Loctite Corporation, www.loctite.com
Viton® is a registered trademark of the E.I. Du Pont de Newmours Co., www.dupont.com

SWITCH TYPE CODE	
BT	FORM C REED SWITCH WITH 5-METER LEAD
BM	FORM C REED SWITCH WITH 5-METER LEAD AND QD
RT	FORM A REED SWITCH WITH 5-METER LEAD

SWITCH TYPE CODE	
RM	FORM A REED SWITCH WITH 5-METER LEAD AND QD
CT	TRIAC SWITCH WITH 5-METER LEAD
CM	TRIAC SWITCH WITH 5-METER LEAD AND QD

Tolomatic™ EXCELLENCE IN MOTION
COMPANY WITH QUALITY SYSTEM CERTIFIED BY DNV = ISO 9001 =
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