Tolomatic™
EXCELLENCE IN MOTION

Parts Sheet

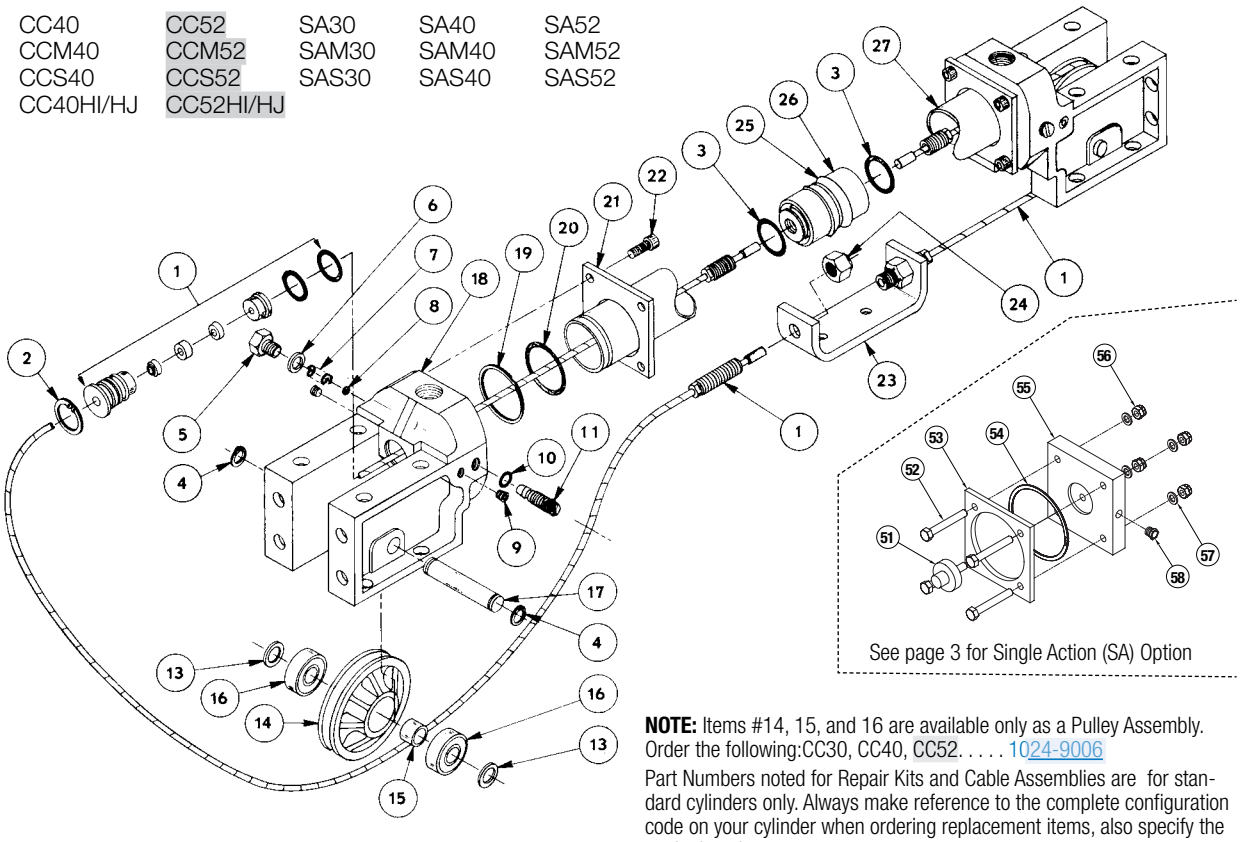
1001-4005_15

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

Cable Cylinder 3" & 4" Bore, 2" Bore Hydraulic

MODELS:

CC30	CC40	CC52	SA30	SA40	SA52
CCM30	CCM40	CCM52	SAM30	SAM40	SAM52
CCS30	CCS40	CCS52	SAS30	SAS40	SAS52
CC30HI/HJ	CC40HI/HJ	CC52HI/HJ			



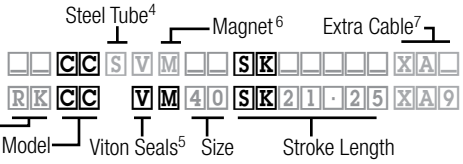
NOTE: Items #14, 15, and 16 are available only as a Pulley Assembly. Order the following:CC30, CC40, CC52. 1024-9006

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.

ITEM	PART NO. OR ORDER CODE	DESCRIPTION	QUANTITY CC30	CCM30	CCS30	CC40	CCM40	CCS40	CC52	CCM52	CCS52
[2,3]1.	CACC30SK_	CABLE ASSEMBLY,	2		2						
	CACCM30SK_	CABLE ASSEMBLY, W/ MAGNET OPTION		2							
	CACC40SK_	CABLE ASSEMBLY,				2		2			
	CACCM40SK_	CABLE ASSEMBLY, W/ MAGNET OPTION					2				
	CACC52SK_	CABLE ASSEMBLY,							2		2
	CACCM52SK_	CABLE ASSEMBLY, BUNA-N MATERIAL								2	
2.	1014-1023	RETAINING RING	2	2	2	2	2	2	2	2	2
[3]3.	1014-1063	O-RING, BUNA-N MATERIAL	2	2	2	2	2	2	2	2	2
	1014-1016	O-RING, VITON® MATERIAL	2	2	2	2	2	2	2	2	2
4.	1004-1056	EXTERNAL RETAINING RING	4	4	4	4	4	4	4	4	4
5.	1024-1045	SCREW	2	2	2	2	2	2	2	2	2

ITEM	PART NO. OR ORDER CODE	DESCRIPTION	QUANTITY CC30	CCM30	CCS30	CC40	CCM40	CCS40	CC52	CCM52	CCS52
6.	1014-1048	GASKET	2	2	2	2	2	2	2	2	2
7.	1014-1046	SPRING	2	2	2	2	2	2	2	2	2
8.	1014-1047	CHECK BALL	2	2	2	2	2	2	2	2	2
9.	1014-1065	PLUG PIPE	4	4	4	4	4	4	4	4	4
[3]10.	1014-1062	O-RING, BUNA-N MATERIAL	2	2	2	2	2	2	2	2	2
	1014-1078	O-RING, VITON® MATERIAL	2	2	2	2	2	2	2	2	2
11.	1014-1044	CUSHION NEEDLE	2	2	2	2	2	2	2	2	2
13.	1004-1053	PULLEY SPACER	4	4	4	4	4	4	4	4	4
14.	1024-1078	PULLEY	2	2	2	2	2	2	2	2	2
15.	1014-1137	BEARING SPACER	2	2	2	2	2	2	2	2	2
16.	1014-1138	BEARING	4	4	4	4	4	4	4	4	4
17.	1014-1052	PULLEY SHAFT	2	2	2	2	2	2	2	2	2

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



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

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

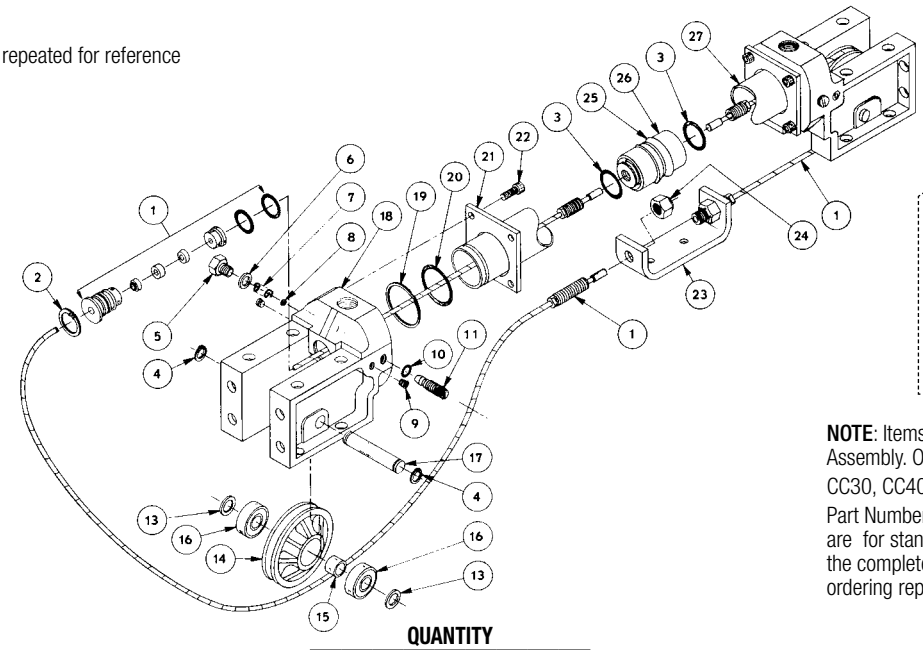
[5] V refers to optional seals of Viton® material.

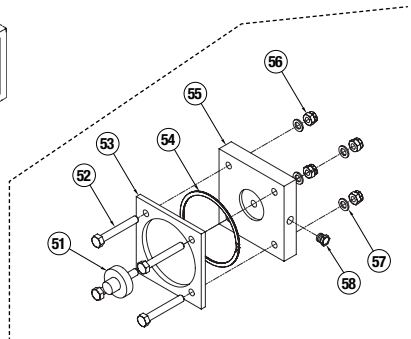
[6] M is for optional switch magnet, which is required for switches to function. Since the Magnet Option adds length to the piston and the tube length, it must be included when ordering.

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

Shadded areas Indicates 2" Bore hydraulic (CC52)

Drawings repeated for reference





See page 3 for Single Action (SA) Option

NOTE: Items #14, 15, and 16 are available only as a Pulley Assembly. Order the following:
CC30, CC40, CC52 1024-9006
Part Numbers noted for Repair Kits and Cable Assemblies are for standard cylinders only. Always make reference to the complete configuration Number on your cylinder when ordering replacement items, also specify the stroke length.

ITEM	PART NO. OR ORDER CODE	DESCRIPTION	QUANTITY CC30	CCM30	CCS30	CC40	CCM40	CCS40	CC52	CCM52	CCS52
18.	1029-9004	HEAD ASSEMBLY, BUNA-N MATERIAL	2	2	2	2	2	2	2	2	2
	1029-9009	HEAD ASSEMBLY, VITON® MATERIAL	2	2	2	2	2	2	2	2	2
19.A	1024-1036	RETAINING RING	2	2	2						
	1029-1036	RETAINING RING				2	2	2			
	1014-1024	RETAINING RING							2	2	2
[3]20.	1024-1037	O-RING, BUNA-N MATERIAL	2	2	2						
	1024-1050	O-RING, VITON® MATERIAL	2	2	2						
	1029-1037	O-RING, BUNA-N MATERIAL				2	2	2			
	1029-1005	O-RING, VITON® MATERIAL				2	2	2			
	1014-1037	O-RING, BUNA-N MATERIAL							2	2	2
	1014-1017	O-RING, VITON® MATERIAL							2	2	2
21.	1024-1058	CLAMP RING	2	2	2						
	1029-1043	CLAMP RING				2	2	2			
	1034-1015	CLAMP RING							2	2	2
22.	1009-1065	SOCKET HEAD CAP SCREW	8	8	8	8	8	8	8	8	8
23.	1014-1057	BRACKET	1	1	1	1	1	1	1	1	1
24.	1014-1058	LOCK NUT	2	2	2	2	2	2	2	2	2
[3]25.	1024-1020	PISTON U-CUP, BUNA-N MATERIAL	2	2	2						
	1024-1059	PISTON U-CUP, VITON® MATERIAL	2	2	2						

ITEM	PART NO. OR ORDER CODE	DESCRIPTION	QUANTITY CC30	CCM30	CCS30	CC40	CCM40	CCS40	CC52	CCM52	CCS52
[3]25	1029-1020	PISTON U-CUP, BUNA-N MATERIAL				2	2	2			
	1029-1004	PISTON U-CUP, VITON® MATERIAL				2	2	2			
	1014-1020	PISTON U-CUP, BUNA-N MATERIAL							2	2	2
	1014-1000	PISTON U-CUP, VITON® MATERIAL							2	2	2
26.	1024-1040	PISTON	1		1						
	1024-1124	PISTON		1							
	1029-1040	PISTON				1		1			
	1029-1101	PISTON					1				
	1034-1040	PISTON							1		1
	1034-1061	PISTON								1	
[1]27.	RTBCCS30SK_	STEEL TUBE			AR						
	RTBCC30SK_	ALUMINUM TUBE	AR								
	RTBCCM30SK_	ALUMINUM TUBE W/ MAGNET		AR							
	RTBCCS40SK_	STEEL TUBE						AR			
	RTBCC40SK_	ALUMINUM TUBE				AR					
	RTBCCM40SK_	ALUMINUM TUBE W/ MAGNET					AR				
	RTBCCS52SK_	STEEL TUBE									AR
	RTBCC52SK_	ALUMINUM TUBE							AR		
	RTBCCM52SK_	ALUMINUM TUBE W/ MAGNET								AR	

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 4 0 SK 2 1 . 2 5 XA 9

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

EXAMPLE: RK CC V M 4 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, O-Rings, and Cable Assembly

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

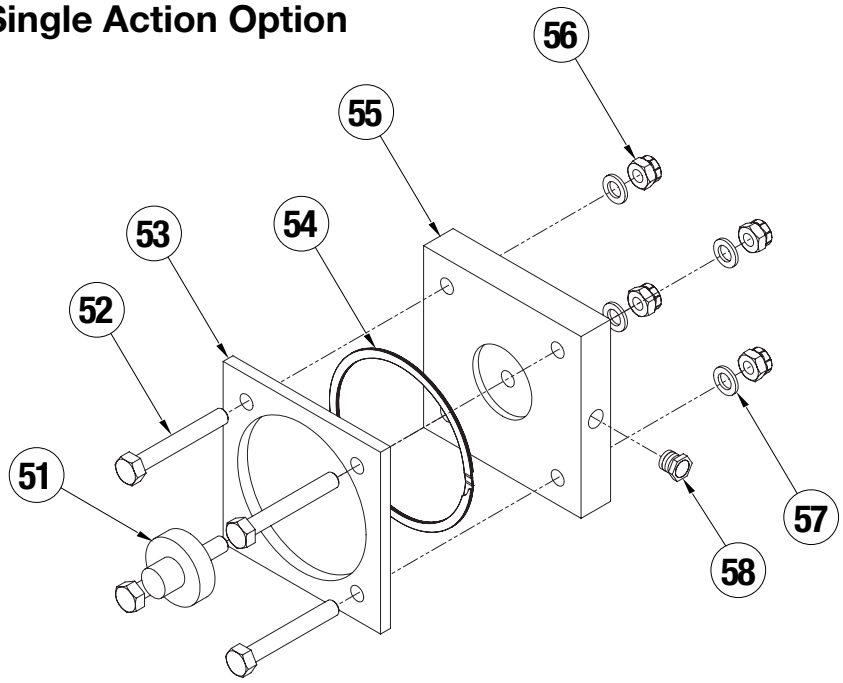
[5] V refers to optional seals of Viton® material.

[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]

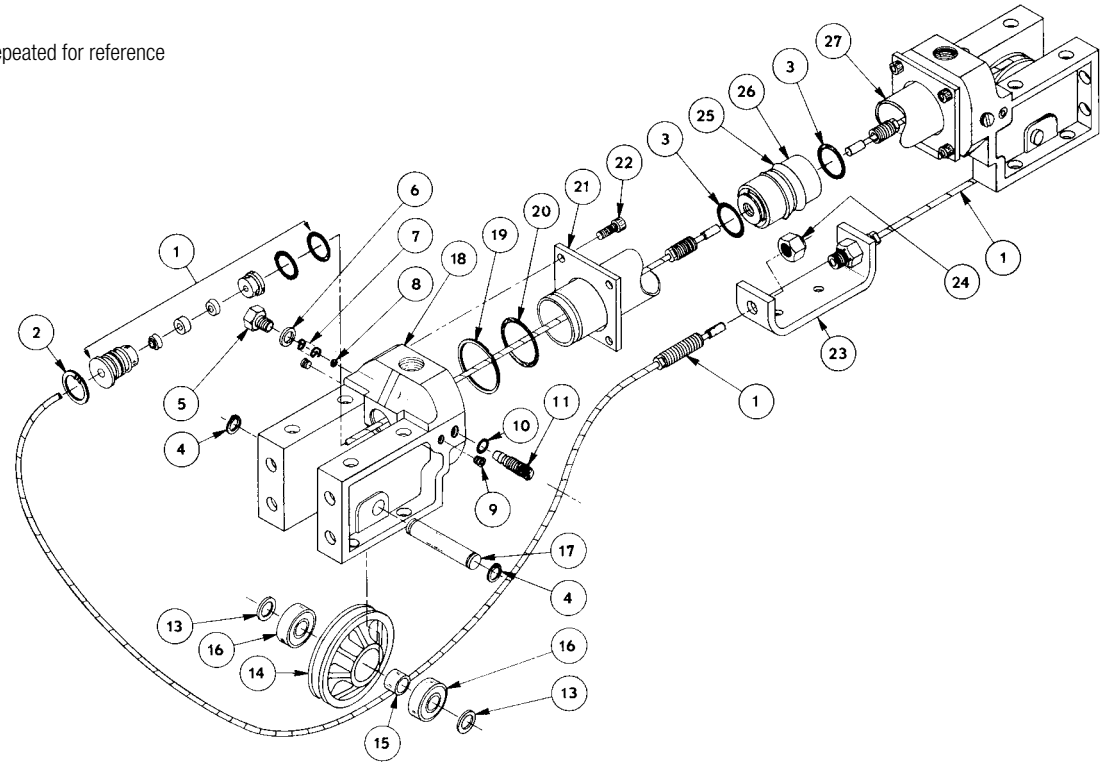
Shadded areas Indicates 2" Bore hydraulic (CC52)

Single Action Option



	PART NO.				
ITEM	SA30	SA40	SA52	DESCRIPTION	QTY
51.	1014-1099	1014-1099	1014-1099	RUBBER BUMPER	1
52.	1014-1100	1014-1100	1014-1100	END CAP FASTENER	4
53.	1024-1041	1029-1043	1014-1067	CLAMP PLATE	1
54.	1024-1036	1029-1036	1014-1024	RETENTION RING	1
55.	1024-1073	1029-1104	1014-1193	END CAP	1
56.	1051-1068	1052-1068	1051-1068	LOCK NUT	4
57.	0701-1007	0701-1007	0701-1007	WASHER	4
58.	0768-1022	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**
CC30, CC40, CC52	220 INCH-POUNDS *(23.73 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.

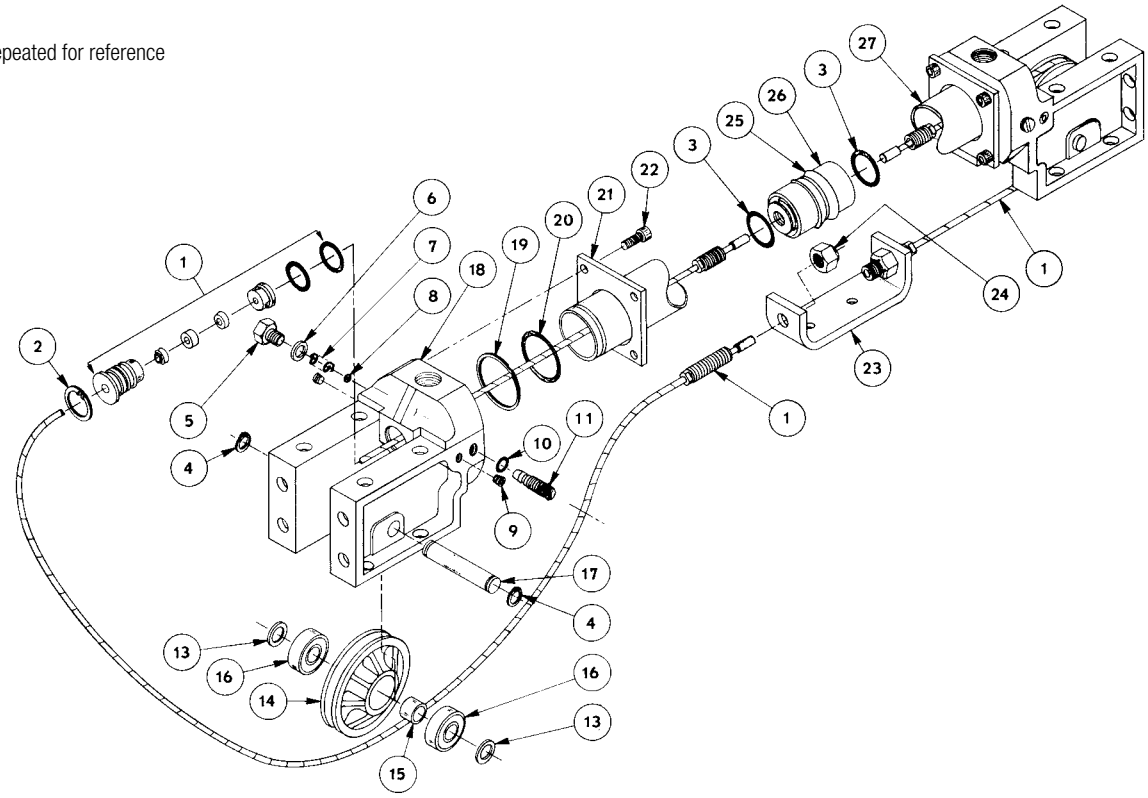
TABLE B: TORQUE FOR UNBLOCKABLE LOADS					
MODEL	**PRETENSIONING TORQUE**	**+**	**STARTING TORQUE OF TERMINAL NUTS**	**=**	**TOTAL PRETENSIONING TORQUE**
CC30	105.0 IN-LBS.	+	25.0 IN.-LBS.	=	130.0 IN.-LBS.
	11.86 N-M	+	*2.82 N-M*	=	*14.68 N-M*
CC40	187.5 IN-LBS.	+	25.0 IN.-LBS.	=	212.5 IN.-LBS.
	21.19 N-M	+	*2.82 N-M*	=	*24.01 N-M*
CC52	115.0 IN-LBS.	+	25.0 IN.-LBS.	=	140.0 IN.-LBS.
	12.99 N-M	+	*2.82 N-M*	=	*15.81 N-M*

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

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).

Drawing repeated for reference



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

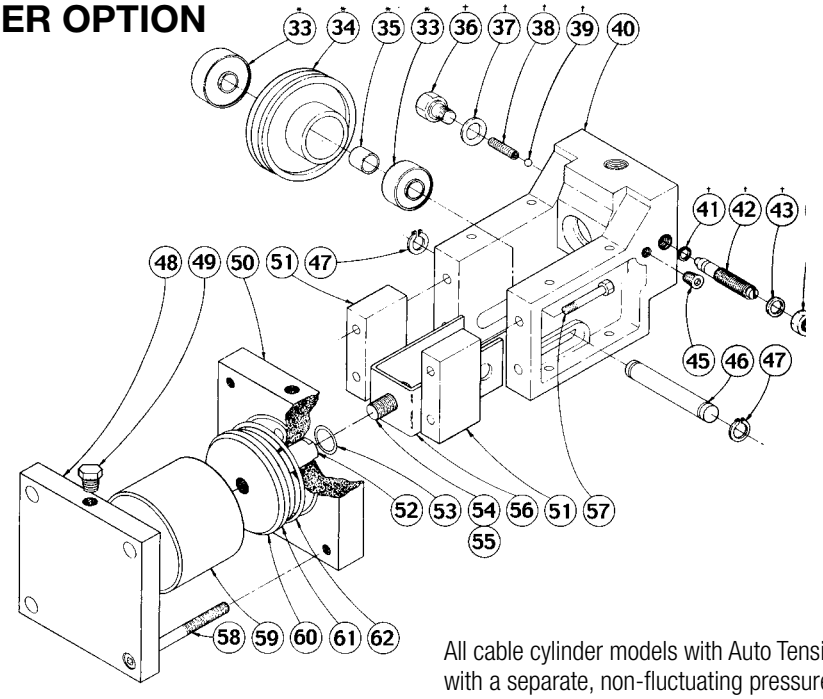
Keep the cylinder as clean as possible around pulleys, glands, etc. Pneumatic service should be adequately lubricated with SAE 10 or 20 grade non-detergent oil. Pulleys have permanently lubricated bearings and will require no maintenance. Check the cylinder's cables periodically to help prevent premature 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



AUTO TENSIONER			Quantity								
ITEM	PART NO.	DESCRIPTION	CC30	CCM30	CCS30	CC40	CCM40	CCS40	CC52	CCM52	CCS52
33	1014-1138	SEALED BALL BEARING	2	2	2	2	2	2	2	2	2
34	1024-1078	PULLEY	1	1	1	1	1	1	1	1	1
35	1014-1137	BEARING SPACER	1	1	1	1	1	1	1	1	1
36	1024-1045	HEX HEAD BOLT	1	1	1	1	1	1	1	1	1
37	1014-1048	CHECK VALVE GASKET	1	1	1	1	1	1	1	1	1
38	1014-1046	CHECK VALVE SPRING	1	1	1	1	1	1	1	1	1
39	1014-1047	CHECK VALVE BALL	1	1	1	1	1	1	1	1	1
40	1029-1065	TENSIONER HEAD	1	1	1	1	1	1	1	1	1
41	1014-1062	O-RING, BUNA-N	1	1	1	1	1	1	1	1	1
42	1014-1044	CUSHION ADJUSTMENT NEEDLE	1	1	1	1	1	1	1	1	1
43	1014-1049	THREAD SEAL	1	1	1	1	1	1	1	1	1
44	1014-1050	HEX HEAD JAM NUT	1	1	1	1	1	1	1	1	1
45	1014-1065	PIPE PLUG	2	2	2	2	2	2	2	2	2
46	1014-1052	PULLEY SHAFT	1	1	1	1	1	1	1	1	1
47	1004-1056	RETAINING RING	2	2	2	2	2	2	2	2	2
48	1024-1110	BACK PLATE	1	1	1	1	1	1	1	1	1
49	0768-1022	HEX HEAD BREATHER PIPE PLUG	1	1	1	1	1	1	1	1	1
50	1024-1109	FRONT TENSIONER PLATE	1	1	1	1	1	1	1	1	1
51	1024-8011	SIDE SPACER	2	2	2	2	2	2	2	2	2
52	1900-1005	PISTON SHAFT	1	1	1	1	1	1	1	1	1
53	0701-1004	O-RING, BUNA-N	1	1	1	1	1	1	1	1	1
54	1039-1045	HEX HEAD BOLT	1	1	1	1	1	1	1	1	1
55	0774-1003	FLAT WASHER	1	1	1	1	1	1	1	1	1
56	1024-8025	TIE PLATE	1	1	1	1	1	1	1	1	1
57	0925-1039	CAP SCREW	4	4	4	4	4	4	4	4	4
58	1900-1009	SOCKET HEAD CAP SCREW	4	4	4	4	4	4	4	4	4
59	1024-1107	TENSIONER TUBE	1	1	1	1	1	1	1	1	1
60	1024-1106	PISTON	1	1	1	1	1	1	1	1	1
61	1024-1105	O-RING, BUNA-N	1	1	1	1	1	1	1	1	1
62	1024-1104	O-RING, BUNA-N	1	1	1	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%
2.50	51%
3.00	54%

BORE SIZE (IN.)	% OF LOAD PRESSURE
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		QUANTITY								
PART NO.	DESCRIPTION	CC30	CCM30	CCS30	CC40	CCM40	CCS40	CC52	CCM52	CCS52
1024-9115	AUTO TENSIONER KIT CC30, CC40, CC52	1	1	1	1	1	1	1	1	1
1024-9127	AUTO TENSIONER KIT CC30, CC40, CC52 – 3 PORTED HEAD	1	1	1	1	1	1	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

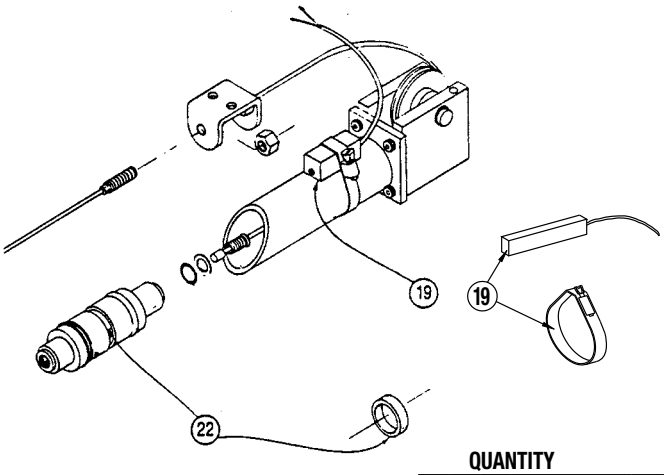
To Order Retrofit Kits

All Switch Kits come with 1 switch and mounting hardware.

Retrofit ordering method: SW □□ □□ □□ □□

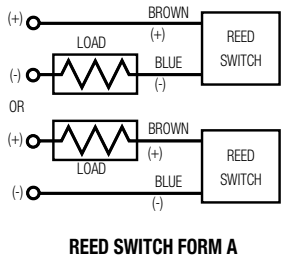
EXAMPLE: SW CC 40 RT

Switch Kit — Model — Size — Switch Type Code



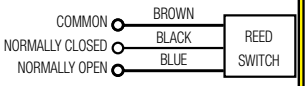
ITEM	PART NO.	DESCRIPTION	QUANTITY CC30, SA30	CCM30, SAM30	CCS30, SAS30	CC40, SA40	CCM40, SAM40	CCS40, SAS40	CC52, SA52	CCM52, SAM52	CCS52, SAS52
22.	1075-1019	MAGNET		1							
	1001-1202	MAGNET					1				
	1075-1019	MAGNET								1	

Universal Switch Wiring Diagrams and Label Color Coding

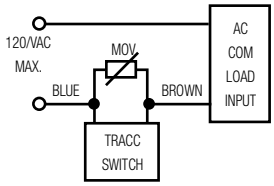


REED SWITCH FORM A
LABEL COLOR: RED
10VA MAX. 200 VDC
500MA MAX. CURRENT

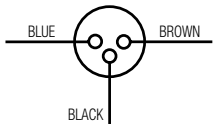
NOTE: The side of the switch with the groove indicates the sensing surface. This must face toward the magnet.



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.

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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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https://www.Tolomatic.com • Email: Help@Tolomatic.com
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