Tolomatic
EXCELLENCE IN MOTION®

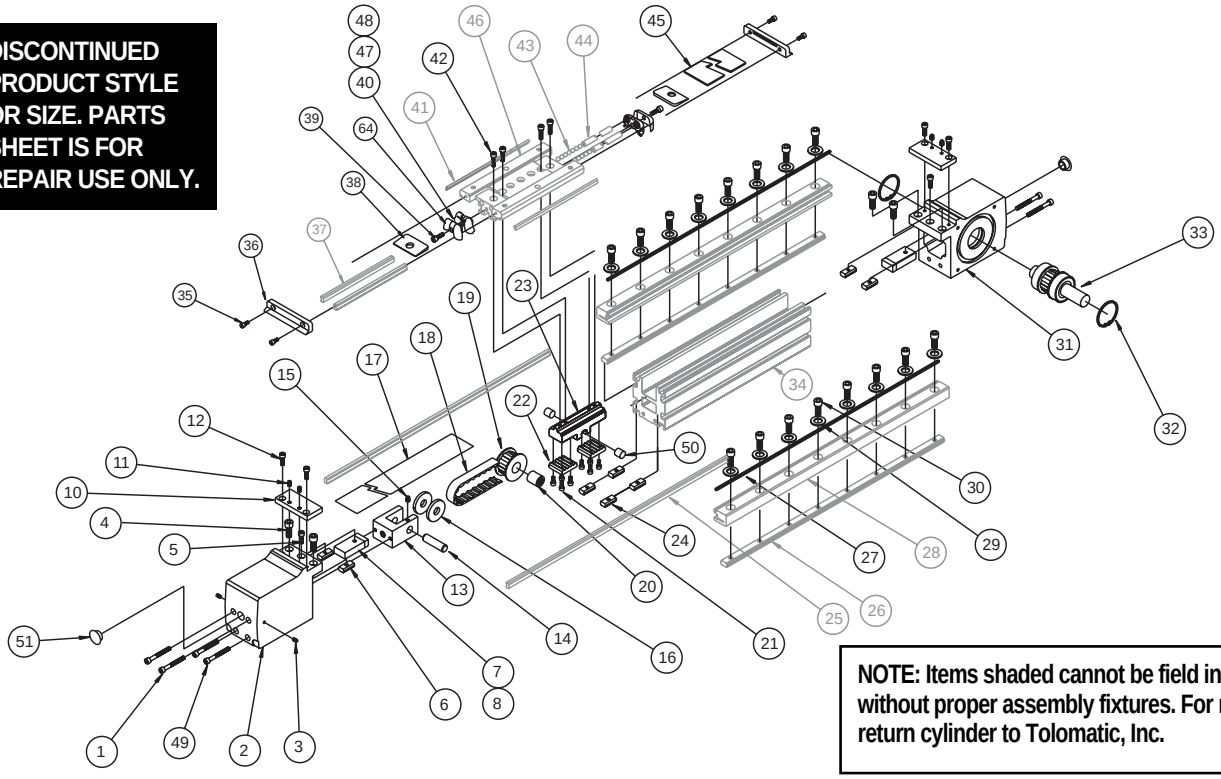
Parts Sheet

3600-4087_02
Replaced by
3600-4124
09-2001

Belt-Drive Actuator

B3B15/M3B15 1-½"/40mm Bore

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



NOTE: Items shaded cannot be field installed without proper assembly fixtures. For repair, return cylinder to Tolomatic, Inc.

List of Parts

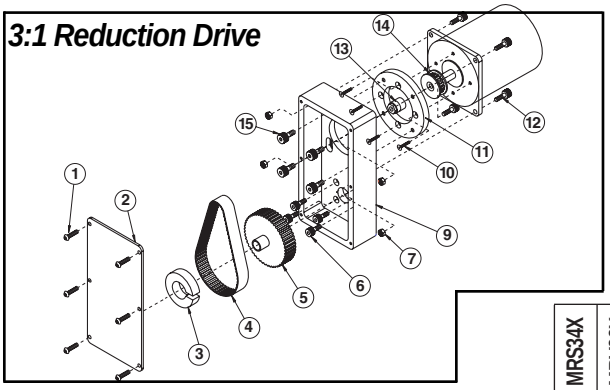
Item	Part No.	Description	B3B15	M3B15
1.	1408-3412	SHCS #10-24 x 1.5	2	
	4910-1061	SHCS M5 x .8 x 40		2
2.	3415-1401	Head, Idler	1	
	4415-1401	Head, Idler (metric)		1
3.	3415-1419	Set Screw #6-32 x .625 cup	2	
	7906-1029	Set Screw M5-0.8 x 6mm		2
4.	1004-1064	SHCS, 1/4-20 x .75	2	
	4420-1002	SHCS, M6 x 20mm		2
5.	2317-1014	SHCS, 1/4-20 x .625	4	
	4420-1002	SHCS, M6 x 20mm		4
6.	3415-1013	Nut, T, BC3	4	
	4415-1013	Nut, T, BC3		4
7.	3415-1407	Bumper Mount	2	
	4415-1407	Bumper Mount (metric)		2
8.	3415-1415	Rubber Cushion	2	2
10.	3415-1404	Band Clamp	2	
	4415-1404	Band Clamp		2
11.	3600-1129	Set Screw, #6-32 x .19	4	
	7906-1029	Set Screw M5-0.8 x 6mm		4
12.	0910-1166	SHCS, #8-32 x 0.50,BLK	4	
	4415-1016	SHCS, M5-0.8 x 16		4
13.	3415-1411	Yoke	1	
	4415-1411	Yoke (metric)		1
14.	3415-1410	Shaft 1/2, x 2.00 LONG	1	1

Item	Part No.	Description	B3B15	M3B15
15.	0910-1039	Set Screw, #10-24 x 0.38, Flat	2	
16.	0515-1019	Washer, Spacer	2	2
17.	3415-1424	Upper Dust Band	A/R	A/R
18.	3415-1421	Belt, 5mm pitch, 1" wide	A/R	A/R
19.	3415-1406	Pulley, Idler, 5mm pitch 1" wide	1	1
20.	0515-1024	Needle Bearing, Æ 1/2 ID	1	1
21.	1307-2018	SHCS, #6-32 x .50	12	
	4415-1023	SHCS, M4 x .7 x 12mm		12
22.	3415-1409	Belt Clamp, 5mm pitch 1" wide	2	2
23.	3415-1408	Belt Bracket	1	
	4415-1408	Belt Bracket (metric)		1
24.	3415-1013	Nut, T, BC3	4	
	4415-1013	Nut, T, BC3		4
25.	3415-1426	Rail Way	A/R	A/R
26.	3415-1428	Nut, Rail	A/R	
	4415-1428	Nut, Rail (METRIC)		A/R
27	3415-1425	Magnet, Band	A/R	A/R
28	3415-1427	Rail Machined	A/R	A/R
29	3415-1059	Washer	A/R	A/R
30.	2317-1014	SHCS, 1/4-20 x .63	A/R	
	4415-1000	SHCS, M6 x 1.0 x 16mm		A/R
31.	3415-1403	Head, Drive	1	

Item	Part No.	Description	B3B15	M3B15
	4415-1403	Head, Drive (metric)		1
32.	3415-1418	Retaining Ring	2	2
33.	3415-9151	Pulley/Shaft/ Bearing Assembly	1	1
34.	3415-1422	Tube, Machined	1	
	4415-1422	Tube, Machined, (metric)		1
35.	0910-1040	SHCS, #6-32 x .38	4	
	4415-1001	SHCS, M4 x .7 x 10		4
36.	3415-1011	End Cap	2	2
37.	3415-1024	Way, Carrier	2	2
38.	3415-1047	Upper Band Ramp	2	2
39.	2307-1021	SHCS, #8-32 x .50	2	
	4415-1024	SHCS, M4 x .7 x 10		2
40.	3415-1014	Ball Return	2	2
41.	3415-1025	Wiper	2	2
42.	0707-1010	SHCS, #10-24 x 5/8	4	

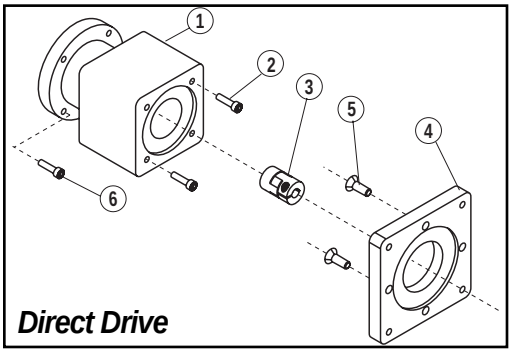
Item	Part No.	Description	B3B15	M3B15
	4415-1016	SHCS, M5 x .8 x 16mm		4
43.	3415-1009	Ball	116	116
44.	3415-1019	Ball Return Tube	2	2
45.	3415-1042	Cover, Carrier	1	1
46.	3415-1006	Machined Carrier	1	
	4415-1006	Machined Carrier		1
47.	3415-1015	Right Ball Race	2	2
48.	3415-1032	Left Ball Race	2	2
49.	1408-3412	SHCS, #10-24 x 1.25	4	
	4910-1061	SHCS, M5 x 0.8 x 40		4
50.	3415-1218	Magnet	2	2
51.	3420-1431	Cap, Plug, Æ .500	2	2
64.	3415-1109	PLT Ball Return	2	2

3:1 Reduction Drive



3:1 Reduction Drive Parts Listing

Item	Part No.	Description	MRS34X	MRV23X	MRB34X MRV34X	MRB40X
1.	0925-1030	Pan Head Screw	6	6	6	6
2.	3420-1435	Cover	1	1	1	1
3.	0520-1067	Clamp Collar, .688 Bore	1	1	1	1
4.	3415-1441	TMG Belt, 85T, 5mm P x 19mm	1			1
	3410-1441	TMG Belt, 85T, 5mm P x 9mm W		1	1	
5.	3415-1439	TMG Pulley, 60T, 19mm W, DIA	1		1	1
	3410-1439	TMG Pulley, 60T, 9mm W, DIA		1		
6.	0707-1010	SHCS, #10-24 x 0.63	4	4	4	4
	4415-1016*	SHCS, M5 x 0.8 x 16	4	4	4	4
7.	2506-1007	Nut, Jam	4	4	4	
9.	3420-1430	Case, 3:1, Reduction, 23 FRM		1		
	3420-1433	Case, 3:1, Reduction, 34 FR	1		1	
	3420-1429	Case, 3:1, Reduction, 40 FR				1
10.	6000-1731	SFHCS, 1/4-20-7/8, BLK				4
11.	0515-1488	Adapter Plate, MRB 40x, RPM				1
12.	1024-7711	SHCS, #10 24 x 0.88, BLK	4	4	4	
	1310-1015	SHCS, 1/4-20 x 1.00, BLK				4
13.	0515-1181	Trantorq, .375 BORE	1			
14.	3415-1444	TMG Pulley, 20T, 19mm W, DIA				
	3415-1445	TMG Pulley, 20T, 19mm W, DIA .750	1			
	3410-1440	TMG Pulley, 20T, 9mm W, DIA .7				
	3410-1437	TMG Pulley, Keyed, 20T, 9mm W		1		1
	3415-1438	TMG Pulley, Keyed, 20T, 19mm W, DIA .50			1	1
	3420-1438	TMG Pulley, Keyed, 20T, 19mm				
15.	1310-1015	SHCS, 1/4-20 x 1.00, BLK				4



Direct Drive

Direct Drive Parts Listing

			Motor				Gearhead			
Item	Part No.	Description	MRS34X	MRB34X	MRV34X	MRB40X	MRS23_, MRV 23_, MRB23 W/GHJ20, GHJ21, GHK20	MRV34_ W/GHJ30	MRB34_, MR334 W/GHJ30, GHJ31, GHK30	MRV34_ W/GHJ31
1.	3410-1452	Motor Adapter, Mach, B3B	1							
	3410-1453	Motor Adapter, Mach, B3B		1	1					
	3410-1457	Motor Adapter, Mach, B3B				1				
	3410-1455	Motor Adapter, Mach, B3B						1	1	1
	3410-1456	Motor Adapter, Mach, B3B					1			
2.	0910-1314	SHCS, #10-24 x 0.75, BLK	4	4	4	4	4	4	4	4
3.	3600-9216	Coupler, Guardian	1							
	3600-6174	Coupler, Zero-Max			1					
	3600-6175	Coupler, Zero-Max								1
	3420-9041	Coupler, Guardian							1	
	3600-6176	Coupler, Zero-Max						1		
	3600-6177	Coupler, Zero-Max					1			
	3600-9219	Coupler, Guardian		1						
	3600-9218	Coupler, Guardian				1				
4.	3410-1445	Motor Adaptor Plate, MRB40X				1				
5.	0920-1024	SFCHS, 1/4-20 x .63, BLK				4				
6.	4415-1020*	SHCS, M5 x .8 x 20, BLK	4	4	4	4				
	0910-1314	SHCS, #10-24 x .75, BLK	4	4	4	4	4	4	4	4

Note: For Belt Tensioner Kit,
Please refer to part sheet number 3600-4602.

** Used on the M3B10 actuator.*

General Disassembly Instructions

Begin with a clean work area. Be sure all replacement parts are present and have no visual damage or defects. The following tools are recommended for proper disassembly and assembly (exact wrench sizes will vary depending on actuator size)

Allen wrench set /Internal retaining ring pliers / Rubber hammer / Loctite #242

1. Remove any motor mounting hardware and/or adapter plates.

2. Release carrier assembly:
   Remove screws(35) from end caps(36) and remove end caps. Remove carrier cover(45). Loosen and remove dust band clamp(10) on idler and drive head by removing SHCS(12). Remove the dust band (17).

   Remove 4 SHCS's(42) that hold the carrier(46) to the belt bracket(23).

3. Remove idler head
   Loosen the two set screws(3). Remove 2 SHCS(1) in the ilder head that hold the tensioning yoke in. Remove 2 SHCS(49) that hold head to bottom of tube. Loosen SHCS(5) that hold head to top of tube. Remove head.

   Loosen 2 sets screws(15) in yoke that hold shaft in. Remove shaft from yoke.

4. Remove belt
   Remove SHCS(21) on both belt clamps(22) of belt bracket(23)

5. Remove drive head
   Remove 2 SHCS(49) that hold the head to the bottom of the tube. Loosen SHCS(5) that hold the head to the top of the tube. Remove head. Pull belt through actuator and head.

6. Optional removal of drive pulley/shaft(33) from drive head.
   Note: Do not remove carrier(46) from rail system. Balls contained in rail way will fall out.

General Assembly Instructions

Any time SHCS are being installed, apply Loctite #242 to the threads.

1. If drive pulley/shaft(33) was removed. Fold belt in half (teeth facing each other) and slip loop end into drive head.

   Wrap belt in a loop and insert it into drive head. Teeth on belt to be facing each other.
   Slide pulley/shaft(33) into drive head. **Note: press shaft in straight as possible. Make sure it is all the way against the retaining ring on the other side of the head. Install retaining ring into groove in head.**

2. Mount drive head to actuator:
   Slide belt through tube and slide drive head onto tube using T-nuts as a guide. Install 2 SHCS(49) to hold head on bottom of tube. Tighten both SHCS(5) on top head.

A. Direct Drive Option: Attach motor spacer (1) to acuator with fasteners (2). Attach coupler (3) to motor shaft. Slide motor/coupler into motor spacer (1). Through alignment hole in motor spacer, fasten coupler to shaft with allen wrench.

B. Belt Reduction Option: Press a Bearing (#30) into the Drive Case (#21). Install and tighten the Reduction Housing to the left side of the Head, and large bore to the top, with four Socket Head Cap Screws (#23) & (#24) and Loctite #222. NOTE: This is the standard mount for the Motor and Reduction Housing. If application calls for a different mounting style, refer to Mounting Configuration diagrams in the Axidyne Belt-Drive Catalog. Insert the longer portion of the shaft of the Pulley/Shaft sub-assembly (#20) through the Head, through the bearing and into the Drive Case. Install the drive Belt over the Pulley. Install Axial Spacer (#22) onto the shaft protruding into the drive case. Install the large Reduction Pulley(#28), with the split hub facing out, onto the shaft protruding into the Drive Case until contact is made with Spacer (#22). There should be a 1/16" gap between the back of the pulley and the housing. The front of the split hub should be approximately flush with the end of the shaft when this gap is achieved.

   Install a Collar (#26) over the split hub of the gear and tighten into position. Slide the Motor/Pulley sub-assembly (#29), with the Motor Leads facing down, partially into the large bore on the top of the Drive Case from the Head side. Install the Reduction Belt (#27) over the two Pulleys in the reduction housing. Apply Loctite #222 to a Socket Head Cap Screw (#23) then thread it part way into the Reduction Case through one of the upper holes of the Motor Flange. Complete the insertion of the Motor/Pulley sub-assembly into the Reduction Housing by rotating the Motor around the Cap Screw until the snout of the Motor can be inserted into the bore of the Reduction Housing. Apply Loctite #222 to the remaining Socket Head Cap Screws, then insert them through the flange and tighten all four Screws. Place the Drive Case Cover (#25) onto the Reduction Case and secure with six Button Head Cap Screws (#7).

3. Mount idler head to actuator:
   Attach the belt(17) to the belt bracket(23) with the belt clamp(23) and SHCS(24). Place the idler pulley(19) inside the the belt loop. Install the idler shaft through the yoke(13) and the two spacer washers(16). Slide idler head onto tube using T-nuts as a guide. Install 2 SHCS(49) to hold head on bottom of tube. Tighten both SHCS(5) on top head. Install 2 SHCS(1) into yoke. Tighten both equal to achieve the desired belt tension. Note: Over tensioning of belt can cause it to stretch prematurely. Tighten both set screws(3).

4. Lubricate ballways:
   Before installing the top dust band(17), lubricate the ballways with #2 Lithium grease.

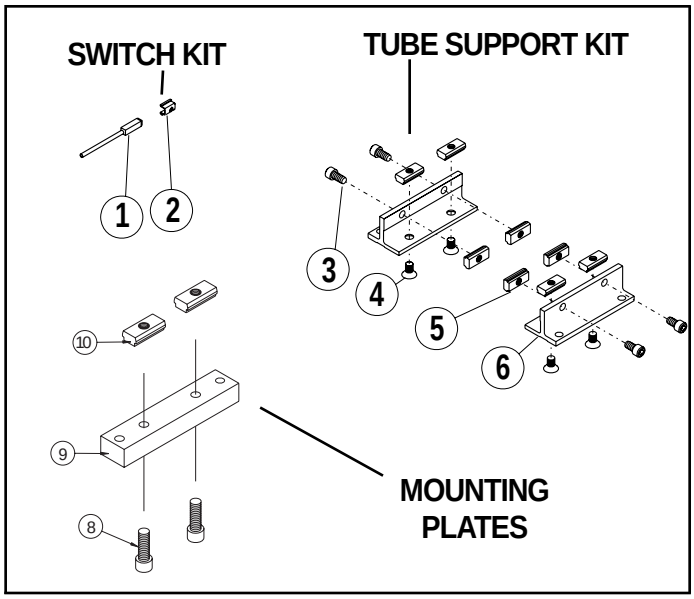
5. Attach Carrier to Belt Bracket:
   Mount carrier(46) to belt bracket(23) with 4 SHCS(42).

6. Trim and Install Dust Band:
   Install dust band(17) over carrier(46) centering it along the length of the actuator. With a tin snips, cut band down 1/16" from the heads. Slide carrier cover(45) into slots on top of carrier. Install carrier endcaps(36) with SHCS. Loosely install band clamps(10) onto each head with SHCS(12). Slide carrier to one end of actuator, and tighten SHCS(12). Slide carrier to other end of actuator and repeat.

7. Test Procedure:
   The torque required to rotate the drive shaft should not exceed the following limits:

	Single Carrier	Auxiliary Carrier & Dual 180°
B3B10:	80 IN-OZ	120 IN-OZ
B3B15:	160 IN-OZ	200 IN-OZ
B3B20:	240 IN-OZ	300 IN-OZ

8. Re-attach any motor adapter plates and/or hardware with actuator.



SWITCH TYPE CODE

BT	(Form C Reed Switch with 5-meter lead)	**CM**	(TRIAC Switch with 5-meter lead and QD)
BM	(Form C Reed Switch with 5-meter lead and QD)	**TT**	(Hall Effect (PNP) Sourcing Switch 5M)
RT	(Form A Reed Switch with 5-meter lead)	**TM**	(Hall Effect (PNP) Sourcing Switch Male Conn)
RM	(Form A Reed Switch with 5-meter lead and QD)	**KT**	(Hall Effect (NPN) Sinking Switch 5M)
CT	(TRIAC Switch with 5-meter lead)	**KM**	(Hall Effect (NPN) Sinking Switch MAL)

All Switch Kits come with 1 switch and mounting hardware.

HARDWARE ONLY KIT: 3415-9999

QUICK-DISCONNECTS: 2503-1025 Female Connector 5M

Reed and TRIAC switches are only recommended for signalling position, not directly powering solenoids. 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.

TO ORDER RETROFIT KITS: SW (then the model number and base size, and code for type of switch needed: **EXAMPLE: SWB3B15RM**

Optional Accesories Parts Listing

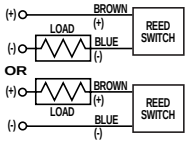
Item	Part No.	Description	Qty.
		SWITCH KIT	
2.	3415-9999	Switch Hardware Kit	A/R
1.	3600-9082	Switch, Reed, Form A, 5M Wire	A/R
	3600-9083	Switch, Reed, Form A, Male Connect	A/R
	3600-9084	Switch, Reed, Form C, 5M Wire	A/R
	3600-9085	Switch, Reed, Form C, Male Connect	A/R
	3600-9086	Switch, Triac, 5M Wire	A/R
	3600-9087	Switch, Triac, Male Connect	A/R
	3600-9988	Switch, Sourcing(PNP), Hall Effect, 5M	A/R
	3600-9989	Switch, Sourcing(PNP), Hall Effect, MA	A/R
	3600-9090	Switch, Sinking(NPN), Hall Effect, 5M	A/R
	3600-9091	Switch, Sinking(NPN), Hall Effect, MAL	A/R
		TUBE SUPPORT KIT	
3.	0801-1251	SHCS, 1/4-20 x 0.50	4
	4415-1005	SHCS, M6 x 1 x 12	4
4.	3415-1046	SFHCS, 1/4-20 x 0.44	4
	4415-1014	SFHCSM6 x 1 x 10	4
5.	3415-1013	BC315 Nut	8
	4415-1013	BC3M315	8
6.	3415-1044	BC315 Tube Support	2
		MOUNTING PLATES	
8.	0801-1251	SFHCS, 1/4-20 x 0.50	4
	4415-1005	M6 x 1 x 12mm	4
9.	3415-1332	Mounting Plate, B32150, 0.50	2
10.	3415-1013	B315 Nut	4
	4415-1013	Nut, Metric	4

REED SWITCHES

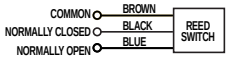
NOTE: Form A Reed Switches should not be used in TTL logic circuits. A voltage drop caused by the L.E.D. indicator will result. For applications where TTL circuits are used, please contact the factory.

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

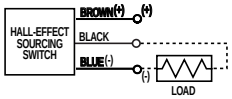
UNIVERSAL SWITCH WIRING DIAGRAMS AND LABEL COLOR CODING



REED SWITCH FORM A
LABEL COLOR: RED
10VA MAX.
200 Vdc
500mA Max. Current

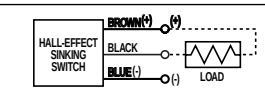


REED SWITCH FORM C
LABEL COLOR: YELLOW
120 Vdc/120 Vac MAX.
250mA Max. Current



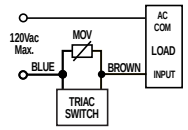
HALL-EFFECT SWITCH
(SOURCING)

LABEL COLOR: WHITE
Input Voltage:5-25 VDC only
Output Current: 200 mA Max.

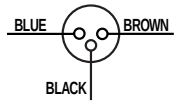


HALL-EFFECT SWITCH
(SINKING)

LABEL COLOR: GREEN
Input Voltage:5-25 VDC only
Output Current: 200 mA Max.



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.

2503-1025 Female Connector 5M

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

For complete Reed and TRIAC Switch Performance Data, refer to the Tolomatic Pneumatic Products Catalog # 9900-4000.

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