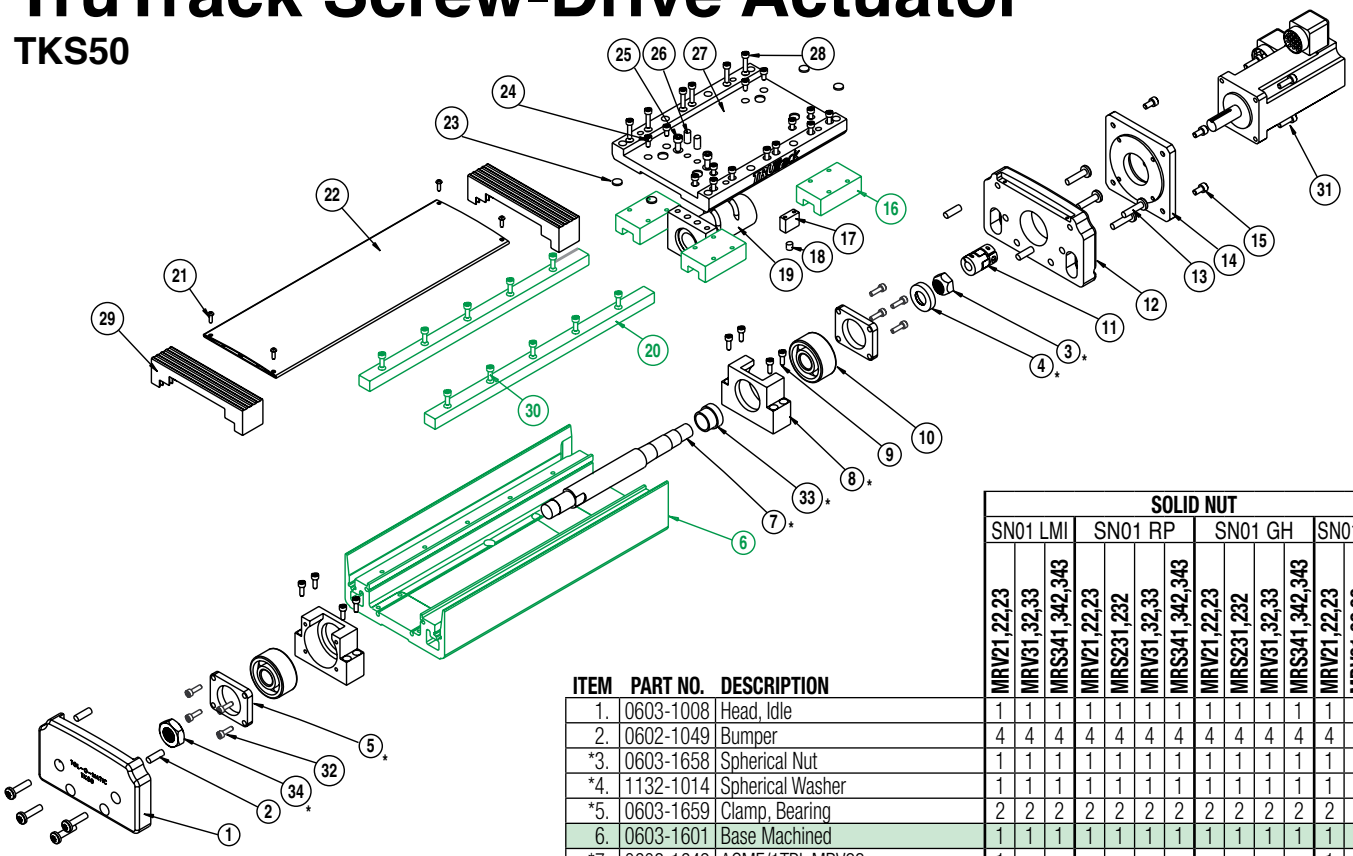
Tolomatic™
EXCELLENCE *IN MOTION*

Parts Sheet

3600-4621_10

TruTrack Screw-Drive Actuator

TKS50



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

***Not backward compatible with units manufactured before 08/01/2003**

(11-16-2015) DISCONTINUED PRODUCT STYLE OR SIZE. PARTS SHEET IS FOR REPAIR INSTRUCTIONS ONLY.

Parts listing is for reference only. All parts listed are limited to stock on hand. Contact Tolomatic regarding availability.

			SOLID NUT												
			SN01 LMI			SN01 RP				SN01 GH				SN01 BRK		
ITEM	PART NO.	DESCRIPTION	MRV21,22,23	MRV31,32,33	MRS341,342,343	MRV21,22,23	MRS231,232	MRV31,32,33	MRS341,342,343	MRV21,22,23	MRS231,232	MRV31,32,33	MRS341,342,343	MRV21,22,23	MRV31,32,33	MRS341,342,343
1.	0603-1008	Head, Idle	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2.	0602-1049	Bumper	4	4	4	4	4	4	4	4	4	4	4	4	4	4
*3.	0603-1658	Spherical Nut	1	1	1	1	1	1	1	1	1	1	1	1	1	1
*4.	1132-1014	Spherical Washer	1	1	1	1	1	1	1	1	1	1	1	1	1	1
*5.	0603-1659	Clamp, Bearing	2	2	2	2	2	2	2	2	2	2	2	2	2	2
6.	0603-1601	Base Machined	1	1	1	1	1	1	1	1	1	1	1	1	1	1
*7.	0603-1649	ACME/1TPI, MRV23	1											1		
	0603-1652	ACME/1TPI, MRV,MRS34, BRK.34		1	1										1	1
	0603-1646	ACME/1TPI, GH.23								1	1					
	0603-1643	ACME/1TPI, GH.34										1	1			
	0603-1655	ACME/1TPI, RP.				1	1	1	1							
*8.	0603-1642	Block Bearing	2	2	2	2	2	2	2	2	2	2	2	2	2	2
9.	0602-1027	SHCS, M4 x 16mm, SST	8	8	8	8	8	8	8	8	8	8	8	8	8	8
*10.	3420-1222	Bearing, Contact Dbl. Row Angular	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11.	3600-9252	Coupler Kit	1	1						1	1	1	1	1	1	
	3600-9253	Coupler Kit			1											1
12.	0603-1007	Head, Drive	1	1	1	1	1	1	1	1	1	1	1	1	1	1
13.	0604-1025	BHCS, Torx, M6 x 25	8	8	8	8	8	8	8	8	8	8	8	8	8	8
14.	0603-1031	Adapter Plate, MRV23	1							1	1			1		
15.	0603-1016	SHCS, M5 x 10mm, SST.	4							4	4			4		
16.	0602-1006	Block, THK Linear	4	4	4	4	4	4	4	4	4	4	4	4	4	4
17.	0602-1013	Magnet Block	2	2	2	2	2	2	2	2	2	2	2	2	2	2
18.	2224-1016	Magnet Rod	2	2	2	2	2	2	2	2	2	2	2	2	2	2
19.	0603-9000	Assy. Connector Acme Nut	1	1	1	1	1	1	1	1	1	1	1	1	1	1
20.	0603-1013	Rail, Machined	2	2	2	2	2	2	2	2	2	2	2	2	2	2
21.	0603-1036	Screw, Button M3 X 10mm, Sst	4	4	4	4	4	4	4	4	4	4	4	4	4	4
22.	0603-1003	Cover	1	1	1	1	1	1	1	1	1	1	1	1	1	1
23.	0601-2090	Pad	4	4	4	4	4	4	4	4	4	4	4	4	4	4
24.	0602-1030	SHCS, M4 x 8mm, SST	8	8	8	8	8	8	8	8	8	8	8	8	8	8
25.	2212-1096	SHCS, M5 x 12mm, SST	2	2	2	2	2	2	2	2	2	2	2	2	2	2
26.	0603-1070	Pin, Dowel	2	2	2	2	2	2	2	2	2	2	2	2	2	2
27.	0603-1004	Carrier	1	1	1	1	1	1	1	1	1	1	1	1	1	1
28.	0602-1029	SHCS, M4 x 18mm, SST	12	12	12	12	12	12	12	12	12	12	12	12	12	12
29.	0603-9830	Bellows Kit	1	1	1	1	1	1	1	1	1	1	1	1	1	1
30.	2212-1093	SHCS, M4 x 12, SST	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
31.	2212-1098	SHCS, M5 x 20, SST	4	4											4	4
	2212-1097	SHCS, M5 x 16, SST			4					4	4	4	4	4		
	2212-1096	SHCS, M5 x 12, SST														
32.	0604-1028	SHCS, M4 x 14, SST	8	8	8	8	8	8	8	8	8	8	8	8	8	8
*33.	0603-1641	Taper Sleeve	1	1	1	1	1	1	1	1	1	1	1	1	1	1
*34.	2410-1157	Nut, Hex, 9/16-18	1	1	1	1	1	1	1	1	1	1	1	1	1	1

(11-16-2015) DISCONTINUED PRODUCT STYLE OR SIZE. PARTS SHEET IS FOR REPAIR INSTRUCTIONS ONLY.

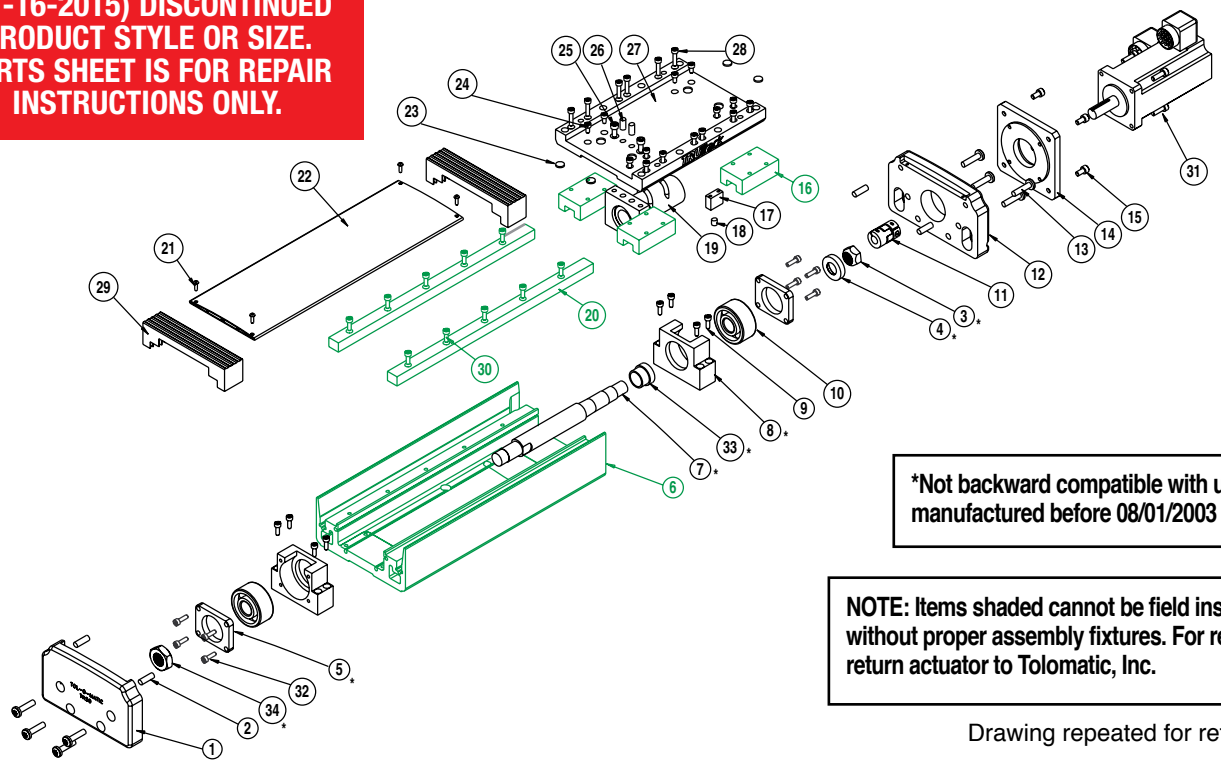
Parts listing is for reference only. All parts listed are limited to stock on hand. Contact Tolomatic regarding availability.

			BALL NUT																									
			BN02 LMI			BN02RP				BN02GH			BN02 BRK			BN05 LMI			BN05 RP				BN05 GH			BN05 BRK		
ITEM	PART NO.	DESCRIPTION	MRV21, 22,23	MRV31,32,33	MRS341,342,343	MRV21, 22,23	MRS231,232	MRV31,32,33	MRS341,342,343	MRV21, 22,23	MRV31,32,33	MRS341,342,343	MRV21, 22,23	MRV31,32,33	MRS341,342,343	MRV21, 22,23	MRV31,32,33	MRS341,342,343	MRV21, 22,23	MRS231,232	MRV31,32,33	MRS341,342,343	MRV21, 22,23	MRV31,32,33	MRS341,342,343	MRV21, 22,23	MRV31,32,33	MRS341,342,343
1.	0603-1008	Head, Idle	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2.	0602-1049	Bumper	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
*3.	0603-1658	Spherical Nut	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
*4.	1132-1014	Spherical Washer	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
*5.	0603-1659	Clamp, Bearing	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
6.	0603-1601	Base Machined	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
*7.	0603-1651	Ball/2TPI, MRV23	1										1																
	0603-1654	Ball/2TPI, MRV,MRS34, BRK.34		1	1									1	1														
	0603-1648	Ball/2TPI, GH.23								1																			
	0603-1645	Ball/2TPI, GH.34									1	1																	
	0603-1657	Ball/2TPI, RP.				1	1	1	1																				
	0603-1650	Ball/5TPI, MRV23														1									1				
	0603-1653	Ball/5TPI, MRV,MRS34, BRK.34															1	1									1	1	
	0603-1647	Ball/5TPI, GH.23																					1						
	0603-1644	Ball/5TPI, GH.34																						1	1				
	0603-1656	Ball/5TPI, RP.																	1	1	1	1							
*8.	0603-1642	Block Bearing	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
9.	0602-1027	SHCS, M4 X 16mm, SST	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
*10.	3420-1222	Bearing, Contact Dbl. Row Angular	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11.	3600-9252	Coupler Kit	1	1						1	1	1	1	1		1	1						1	1	1	1	1		
	3600-9253	Coupler Kit			1										1			1											1
12.	0603-1007	Head, Drive	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
13.	0603-1046	BHCS, Torx M5 X 25	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
14.	0603-1031	Adapter Plate, MRV23	1							1			1			1							1			1			
15.	0603-1016	SHCS, M5 X 10mm, SST.	4							4			4			4							4			4			
16.	0602-1006	Block, THK Linear	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
17.	0602-1013	Magnet Block	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
18.	2224-1016	Magnet Rod	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
19.	0603-9100	Asy. Connector Ball Nut .500	1	1	1	1	1	1	1	1	1	1	1	1	1														
	0603-9200	Asy. Connector Ball Nut .200														1	1	1	1	1	1	1	1	1	1	1	1	1	1
20.	0603-1013	Rail, Machined	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
21.	0603-1036	Screw, Button M3 X 10mm, SST	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
22.	0603-1003	Cover	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
23.	0601-2090	Pad	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
24.	0602-1030	SHCS, M4 X 8mm, SST	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
25.	2212-1096	SHCS, M5 X 12mm, SST	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
26.	0603-1070	Pin, Dowel	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
27.	0603-1004	Carrier	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
28.	0602-1029	SHCS, M4 X 18mm, SST	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
29.	0603-9830	Bellows Kit	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
30.	2212-1093	SHCS, M4 X 12, SST	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
31.	2212-1098	SHCS, M5 X 20, SST	4													4													
	2212-1097	SHCS, M5 X 16, SST		4						4	4	4	4	4	4		4						4	4	4	4	4	4	4
	2212-1096	SHCS, M5 X 12, SST			4													4											
32.	0604-1028	SHCS, M4 X 14, SST	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
*33.	0603-1641	Taper Sleeve	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
*34.	2410-1157	Nut, Hex, 9/16-18	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

***Not backward compatible with units manufactured before 08/01/2003**

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

(11-16-2015) DISCONTINUED PRODUCT STYLE OR SIZE. PARTS SHEET IS FOR REPAIR INSTRUCTIONS ONLY.



General Cylinder Disassembly Instructions

Begin with a clean work area. Be sure all replacement parts present and have no visual damage or defects. The following tools are recommended for proper disassembly and assembly.

- Metric Allen Wrench Set
- Torx bit set
- Metric Socket Set
- Metric Combination Wrench Set

1. **Carrier and Head Removal.** Remove Cover Screws (21) and remove the Cover (22). Remove all Cap Screws (24,28) that attach Carrier (27) to THK Blocks (16). Remove Cap Screws (25) that attach Carrier to Nut Connector (19). Lift carrier from THK Blocks and Nut Connector. Note that there are dowel pins locating the Carrier to Nut Connector. Remove Head Screws (13) to remove heads (1,12).

2. **Remove Lead Screw sub-assembly.** On the non-motor end of the actuator remove Nut (34) from Lead Screw (7). Remove the locknut (3) on the motor end as well. Remove the Cap Screws (9) attaching Bearing Blocks (8) to the Base (6), and remove the non-motor end bearing block. The lead screw assembly can now be removed from the base. The motor end bearing is a press fit on the leadscrew journal. The use of a press may be required to get the bearing off. Remove the bearing clamps (5) from the bearing blocks in order to remove the bearings (10).

   Ball nut style: Caution is required if removal of the nut is necessary. Contact the factory for available parts and procedures.
   Plastic nut style: Plastic nuts are factory pinned into the Nut Connector and cannot be removed. If nuts are worn, a new Nut Connector Assy must be ordered.

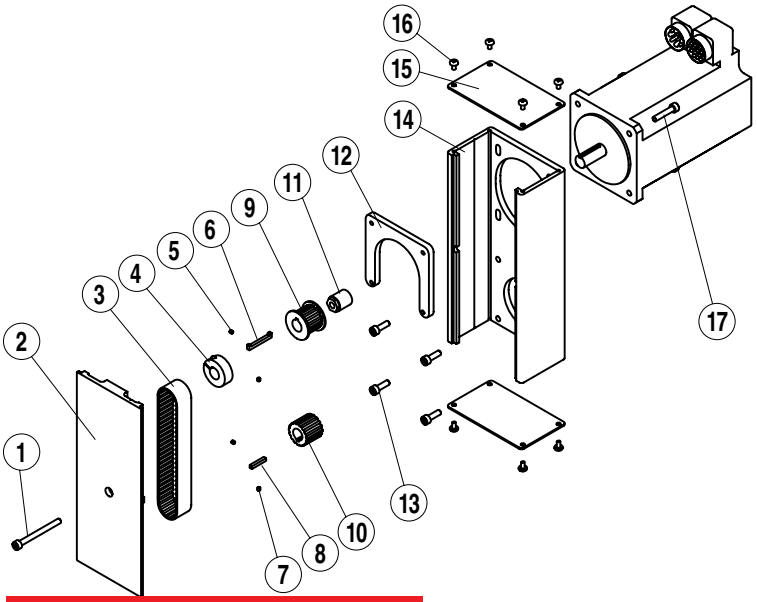
General Cylinder Assembly Instructions

1. **Install Lead Screw Assembly and Carrier.**
   Thoroughly clean the taper sleeve (33) and tapered portion of leadscrew. With nut connector assembly and bearing block on the Lead Screw slide the tapered sleeve onto the motor end of screw, then slide bearing up to leadscrew journal. The bearing must be pressed on to the leadscrew journal up to the tapered sleeve. Take caution to only apply press to the inner race of the bearing. Locate spherical washer (4) over exposed threads, apply Loctite 242 to the threads and locknut, and thread the locknut (3) onto the screw. Torque locknut to 550 in-lbs (62.14 N-m). Locate the bearing block over the bearing and install the bearing clamp, do not torque fasteners at this time. Slide the non-motor end bearing assembly over the end of the lead screw, and locate this assembly on the base. Secure both bearing blocks to the base. Torque Bearing Block fasteners (9) to 25 in-lbs (2.82 N-m). Verify that all bearing clamp fasteners are loose. Attach Carrier to the nut connector, locating on the dowel pins. Secure the fasteners attaching Carrier to the THK Bearing Blocks.

2. **Bearing Alignment.** Position the carrier near the motor end of the actuator. Torque the bearing clamp fasteners to 25 in-lbs (2.82 N-m). Re-position the carrier near the non-motor end of actuator, and torque the bearing clamp fasteners to 25 in-lbs (2.82 N-m). Apply Loctite 242 to the nut (12) and thread onto the non-motor end of lead screw. Torque this nut to 15 in-lbs (1.69 N-m).

3. **Install Heads and Cover.** Attach Heads to the base with head screws (13). Install Cover (22) and attach with screws (21).

Reverse Parallel Screw Drive



(11-16-2015) DISCONTINUED PRODUCT STYLE OR SIZE. PARTS SHEET IS FOR REPAIR INSTRUCTIONS ONLY.

Parts listing is for reference only. All parts listed are limited to stock on hand. Contact Tolomatic regarding availability.

ITEM	PART NO.	DESCRIPTION	REDUCTION RATIO 1:1 Ratio MRV 21,22,23,24	1:1 Ratio MRS 3231,232	1:1 Ratio MRV 31,32,33	1:1 Ratio MRS 341,342,343	1:1 Ratio MRV 21,22,23,24	1:1 Ratio MRS 3231,232	1:1 Ratio MRV 31,32,33	1:1 Ratio MRS 341,342,343
1.	3420-1640	SHCS, M5 X 0.8, 50 mm Long, SST	1	1			1	1		
	3420-1639	SHCS, M5 X 0.8, 55 mm Long, SST			1	1			1	1
2.	0601-1615	Cover, TKS50/75-23 Frame	1	1			1	1		
	0602-1615	Cover, TKS50/75-34 Frame			1	1			1	1
3.	2133-1025	Timing Belt, 330-5m-19	1		1	1				
	2164-1007	Timing Belt, 375-5m-19					1		1	1
	0602-2058	Timing Belt, 330-5m-9		1						
	0603-2057	Timing Belt, 375-5m-9						1		
4.	2312-1005	Clamp Collar, Ø.500				1				1
5.	4415-1015	Set Screw, M3 x 0.5 x 3 Mm Long	2		2		2		2	
6.	2132-1021	Key, Special, .125 x .125	1		1		1		1	
7.	4415-1015	Set Screw, M3 x 0.5 x 3 Mm Long	2	2	2	2	2	2	2	2
8.	2100-1021	Key, .125 x .125 x .75 Long			1	1				
	1004-7706	Key, .125 x .125 x 1.00 Long	1	1			1	1	1	1
9.	2132-1002	Pulley, 16 Teeth, 19 mm Width	1		1		1		1	
	0602-9850	Pulley, 16 Teeth, 19 mm Width				1				1
	0601-1062	Pulley, 16 Teeth, 9 mm Width		1				1		
10.	0603-1053	Pulley, 16 Teeth, 19 mm Width	1		1	1				
	0603-1054	Pulley, 32 Teeth, 19 mm Width					1		1	1
	0602-1062	Pulley, 16 Teeth, 9 mm Width		1						
	0602-1063	Pulley, 32 Teeth, 9 mm Width						1		
11.	0510-1111	Trantorq, Ø.250		1				1		
12.	0601-1053	Plate, Motor, 23 Frame	1	1			1	1		
	0602-1057	Plate, Motor, 34 Frame			1	1			1	1
13.	2212-1097	SHCS, M5 x 0.8 x 16 mm Long, Sst	4	4	4	4	4	4	4	4
14.	0601-1605	Housing, TKS25-23 Frame	1	1			1	1		
	0602-1605	Housing, TKS25-34 Frame			1	1			1	1
15.	0601-1602	End Cap	2	2			2	2		
	0602-1602	End Cap			2	2			2	2
16.	0601-1625	Screw, #6 x .25, Self-tapping, Sst	8	8	8	8	8	8	8	8
17.	2212-1098	SHCS, M5 x 0.8 x 20 mm Long, SST		4				4		
	2212-1099	SHCS, M5 x 0.8 x 25 mm Long, SST	4		4	4	4		4	4

Reverse Parallel Disassembly Instructions

1. Remove End Cap's (15). Release tension on belt by breaking loose the motor fasteners (17).
2. Remove RP Cover (2).
3. Remove both drive pulley (9) and driven pulley (10) from their respective shafts. The belt (3) will come off with the pulleys.
4. Remove motor fasteners (17) to remove motor from RP case.
5. Remove the RP case (14) from the head by removing fasteners (13).

Reverse Parallel Assembly Instructions

*Apply Loctite #242 to all fasteners upon installation

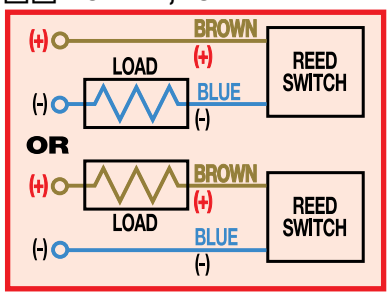
1. Install RP case (14) to the head with cap screws (13).
2. Install the motor to the RP case with fasteners (17). Do not tighten the fasteners at this time.
3. Locate the belt (3) over the pulleys and slide the drive (9) and driven (10) pulleys over their respective shafts. Tighten each pulley to it's shaft with either trantorque or collar clamp. If trantorque, utilize torque wrench to apply appropriate torque.
   1/2" hex on trantorque apply 75 in-lbs (8.47 N-m).
   5/8" hex on trantorque apply 100 in-lbs (11.3 N-m).
4. Verify that there is clearance between the inside of the RP case and each pulley. Verify that the pulleys are aligned to each other.
5. Position the cover (2) in mating slot of the RP case and install the SHCS (1) to hold in place.
6. Tension the belt by pulling the motor away from the drive shaft with the appropriate force in the chart below. Tighten the motor fasteners while this force is applied to the motor.

Motor Frame	Tension Force
MRB23, MRS17/23	10 lbf (44.48 N)
MRV23, MRS34	20 lbf (88.96 N)
MRV34, MRB34	30 lbf (133.45 N)

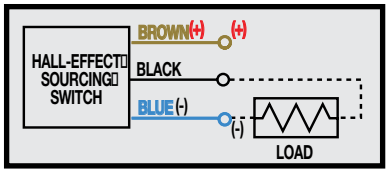
7. Install both end caps (15) with the screws (16) to finalize assembly.

WIRING DIAGRAMS

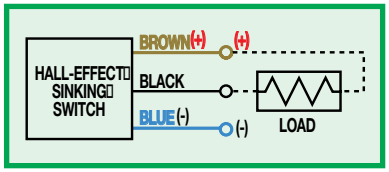
RT DC REED, FORM A



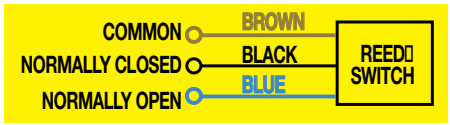
TT HALL-EFFECT, SOURCING, PNP



KT HALL-EFFECT, SINKING, NPN



BT DC REED, FORM C

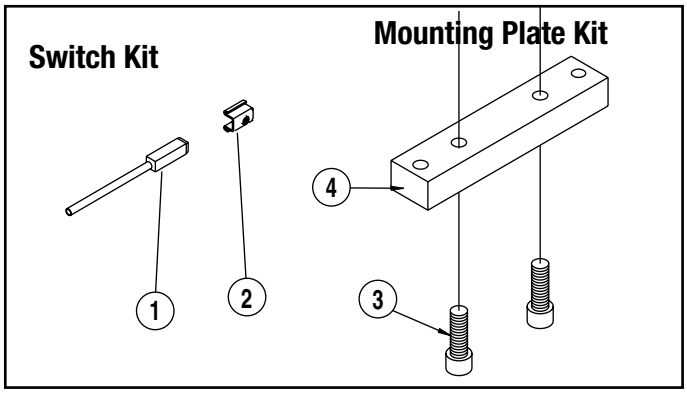


INSTALLATION INFORMATION

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

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

(11-16-2015) DISCONTINUED PRODUCT STYLE OR SIZE. PARTS SHEET IS FOR REPAIR INSTRUCTIONS ONLY.



List of Parts

Item	Part No.	Description	QTY.
		SWITCH KIT	
2	0601-9901	SWITCH HARDWARE KIT	1
1	3600-9082	SWITCH, REED, FORM A, 5M WIRE	
	3600-9084	SWITCH, REED, FORM C, 5M WIRE	
	3600-9088	SWITCH, SOURCE, HALL, 5M WIRE	
	3600-9090	SWITCH, SINKING, HALL, 5M WIRE	
		MOUNTING PLATES	
3	2212-1101	SHCS, M8 X 18	2
4	0603-1080	MOUNTING PLATE, TK75	1

SWITCH TYPE CODE

BT	(Form C Reed Switch with 5-meter lead)
RT	(Form A Reed Switch with 5-meter lead)
KT	(Hall-effect Switch (Sinking) 5-meter lead)
TT	(Hall-effect Switch (Sourcing) 5-meter lead)

OPTIONAL ACCESSORY ASSEMBLY INSTRUCTIONS

1. MOUNTING PLATES. Mounting Plates should be secured at the required distances determined for the application to prevent tube deflection. Apply Loctite #242 to Screws and secure Mounting Plates to tube, aligning holes in tube with holes in Mounting Plates.

2. 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 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.

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

For complete Switch Performance Data, refer to the TKS & TKB Actuators catalog #3600-4179.

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

EXAMPLE: SWTK50BT
Where **SW** is the switch kit, **TK** is the model, **50** is the 2" size, and **BT** is a Form C Reed Switch with 5-meter lead.

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