

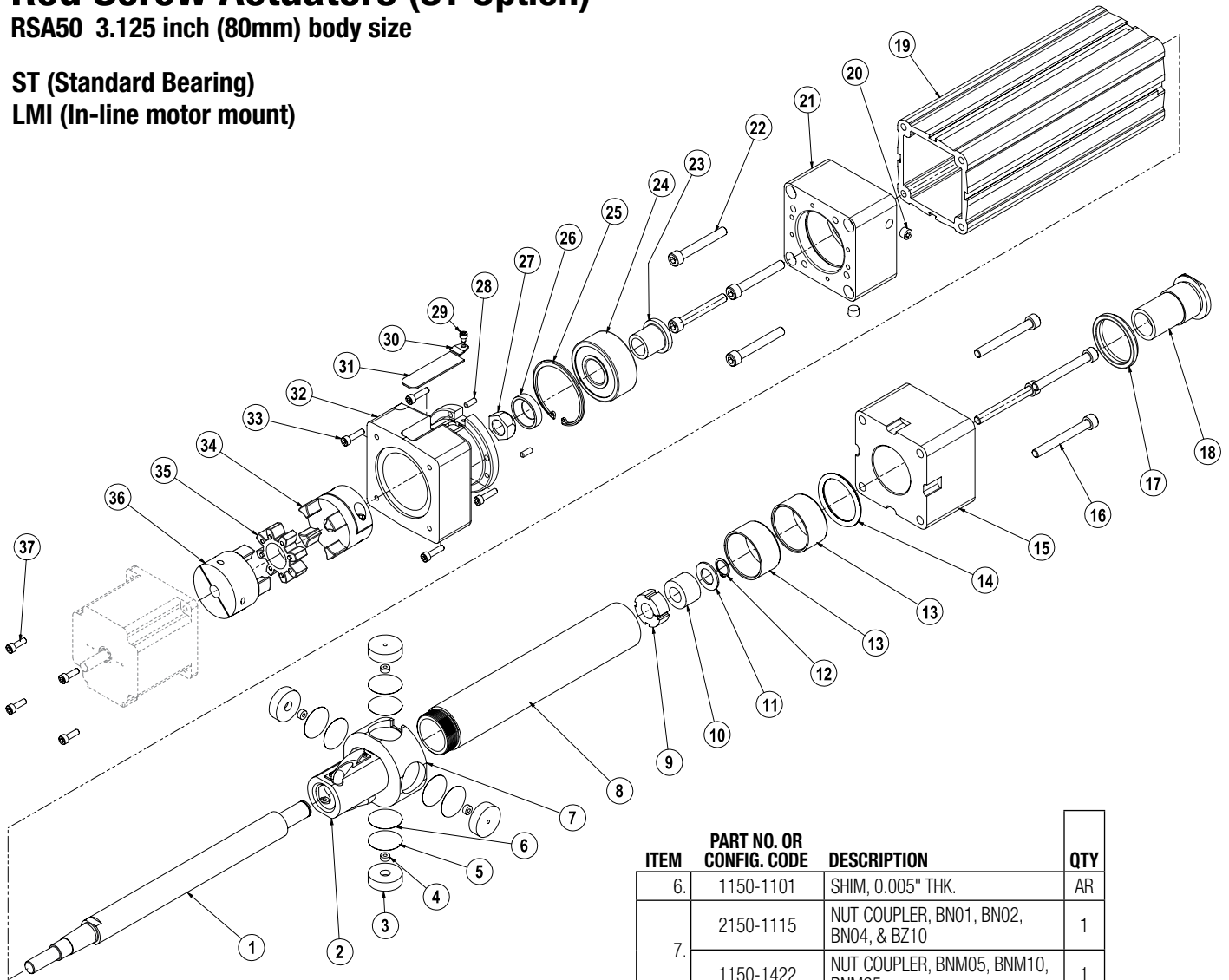
Rod Screw Actuators (ST Option)

3600-4105_18

RSA50 3.125 inch (80mm) body size

ST (Standard Bearing)

LMI (In-line motor mount)



ITEM	PART NO. OR CONFIG. CODE	DESCRIPTION	QTY
† 1.	RLRSA50	LEADSCREW	1
2.	2150-1013	BN01 BALLNUT	1
	2150-1012	BN02 BALLNUT	1
	2150-1011	BN04 BALLNUT	1
	2744-1014	BNM05 BALLNUT	1
	2744-1084	BNM10 BALLNUT	1
3.	2744-1445	BNM25 BALLNUT	1
	2150-1017	BZ10 BRONZE NUT	1
	2150-1120	COUPLER/NUT BEARING	4
4.	2403-1008	MAGNET	4
5.	1150-1100	SHIM, 0.002" THK.	AR

ITEM	PART NO. OR CONFIG. CODE	DESCRIPTION	QTY
6.	1150-1101	SHIM, 0.005" THK.	AR
7.	2150-1115	NUT COUPLER, BN01, BN02, BN04, & BZ10	1
	1150-1422	NUT COUPLER, BNM05, BNM10, BNM25	1
† 8.	TRARSA50	THRUST ROD	1
9.	2133-1062	LEADSCREW GUIDE BUSHING	1
10.	2133-1029	BUMPER	1
11.	2133-1018	WASHER	1
12.	1004-1056	RETAINING RING	1
13.	2133-1023	BEARING SLEEVE	2
14.	2133-1020	O-RING	1

NOTE: HT option actuators cannot be field repaired without proper assembly fixtures - return to Tolomatic for repairs or maintenance

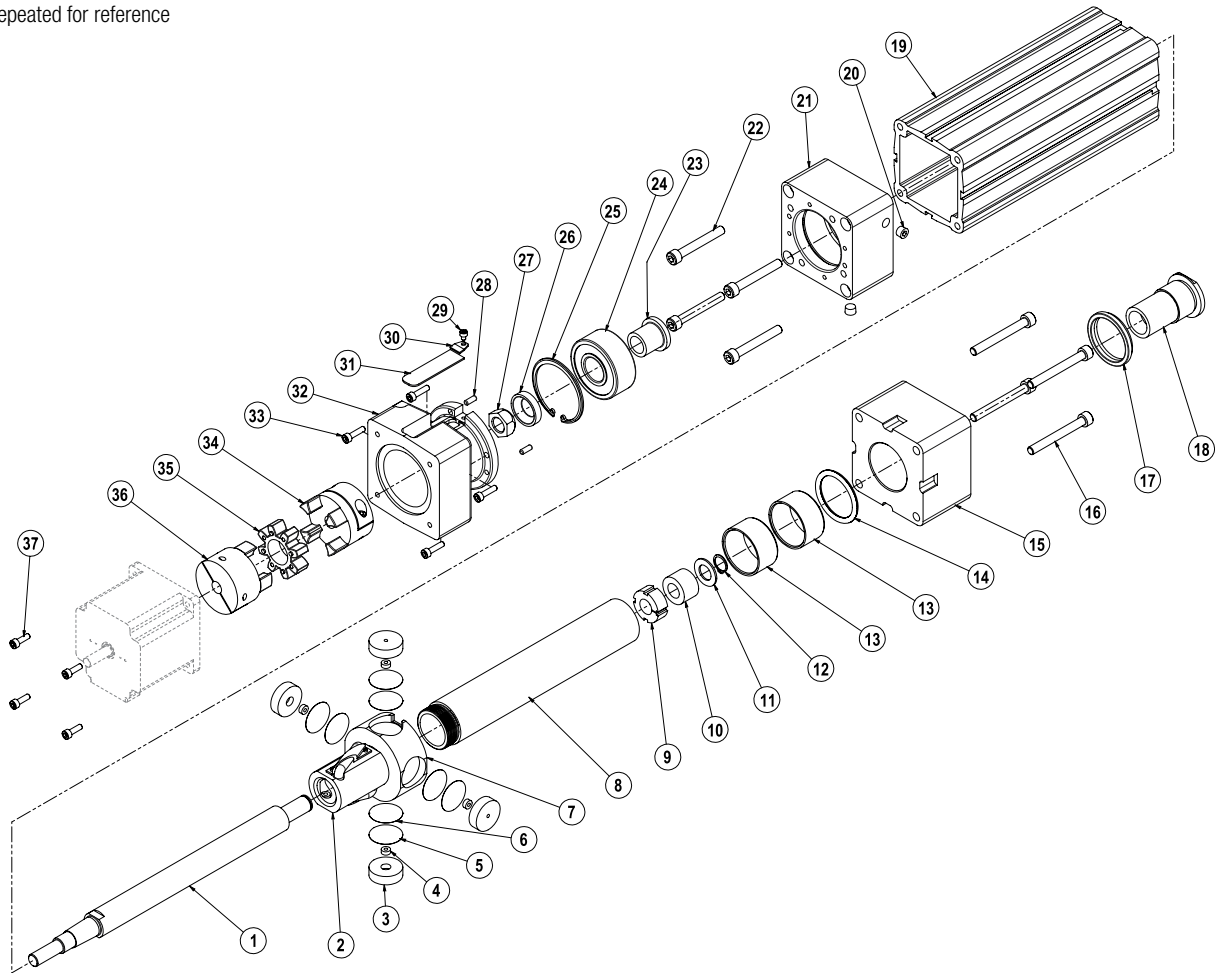
NOTE: The RSA had design changes in 2003 and 2005. Some components will not be compatible with current parts. Contact Tolomatic if you are attempting repairs on units manufactured before 2005.

† Replacement ordering method: **RLS** **RSA50** **SK** **STNX**

EXAMPLE: **RLS** **RSA50** **BN04** **SK21-25** **STNX**

Replacement Lead Screw _____ Nut Style _____ Stroke _____ High Torque or _____
 Model & Size _____ & Size _____ Length _____ Standard Torque _____
 Assembled with Nut ON Leadscrew (required for RN)

Drawing repeated for reference



ITEM	PART NO. OR CONFIG. CODE	DESCRIPTION	QTY
15.	1150-1002	HEAD (U.S. STD)	1
	2133-1002	HEAD (METRIC)	1
16.	2212-1105	HEAD FASTENER	4
17.	2133-1030	WIPER	1
18.	1150-1006	ROD END (U.S. STD)	1
	2133-1006	ROD END (METRIC)	1
† 19.	RTBRSA50	CYLINDER BODY	1
	RTBRSA50	CYLINDER BODY (METRIC)	1
20.	1150-1547	PIPE FITTING	2
21.	1150-1037	BEARING PLATE (U.S. STD)	1
	2150-1037	BEARING PLATE (METRIC)	1
22.	1150-1004	REAR HEAD FASTENER	4
23.	1150-1144	LEADSCREW SLEEVE	1
24.	2133-1022	BEARING	1
25.	2133-1021	RETAINING RING	1
26.	1150-1114	WASHER	1
27.	1150-1113	NUT	1
28.	1820-1003	DOWEL PIN	2

ITEM	PART NO. OR CONFIG. CODE	DESCRIPTION	QTY
29.	1124-1159	COVER CLAMP FASTENER	1
30.	1906-1022	COVER CLAMP	1
31.	3410-1120	COVER	1
32.	*CONFIGURED	MOTOR SPACER	1
33.	*CONFIGURED	MOTOR SPACER FASTENER	4
34.	*CONFIGURED	COUPLER HALF	1
35.	3600-6192	SPIDER	1
36.	*CONFIGURED	COUPLER HALF	1
37.	*CONFIGURED	SOCKET HEAD CAP SCREW	4

* Part number varies depending on YMH (Your Motor Here). Contact help@tolomatic.com for replacement part number

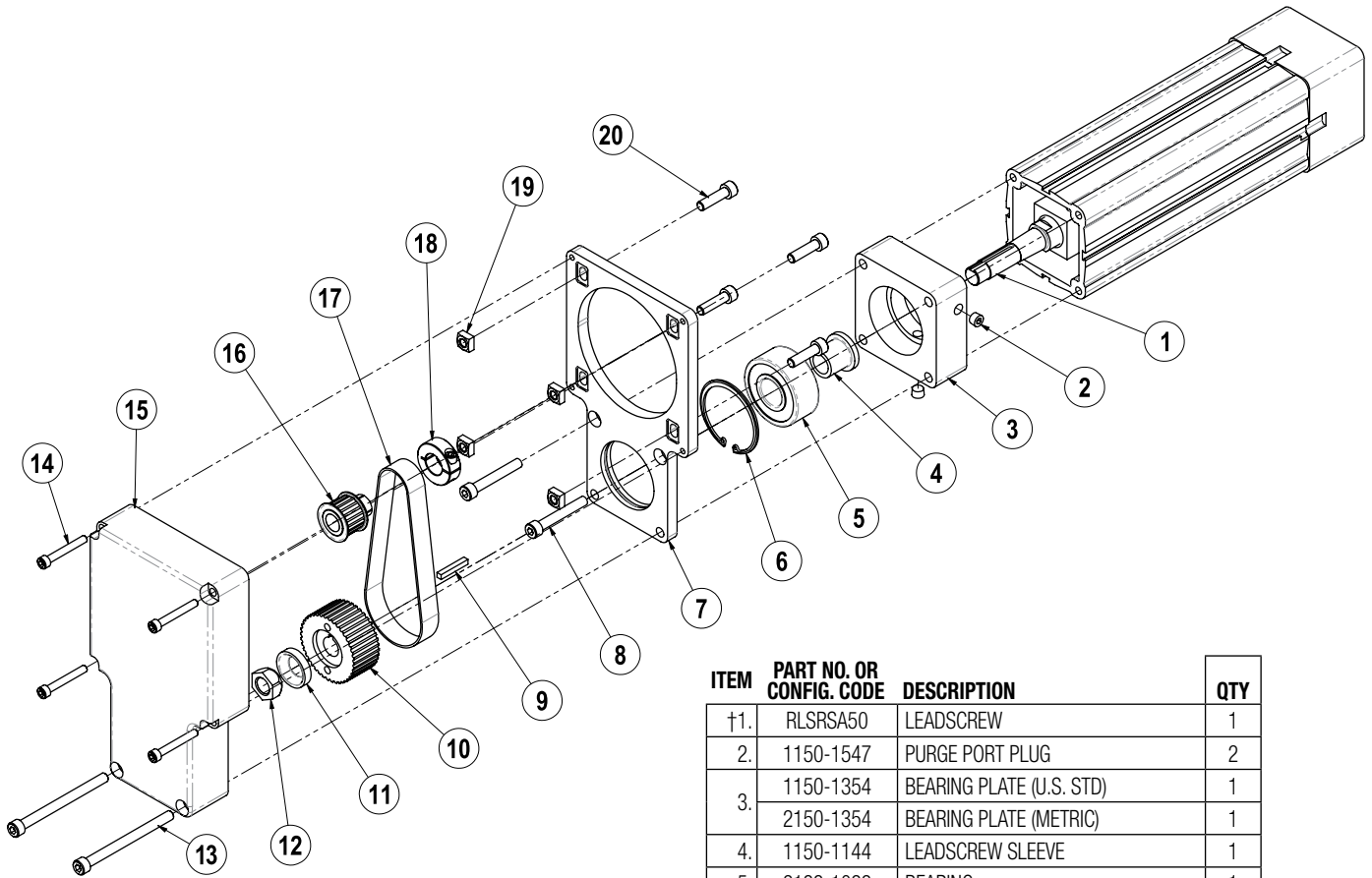
NOTE: HT option actuators cannot be field repaired without proper assembly fixtures - return to Tolomatic for repairs or maintenance

NOTE: The RSA had design changes in 2003 and 2005. Some components will not be compatible with current parts. Contact Tolomatic if you are attempting repairs on units manufactured before 2005.

† Replacement ordering method: **RLS RSA50** **SK** **ST NX**

Replacement Lead Screw **EXAMPLE: RLS RSA50 BNO4 SK2I.25 ST NX** Assembled with Nut ON Leadscrew (required for RN)
 Model & Size Nut Style & Size Stroke Length High Torque or Standard Torque

ST (Standard Bearing)
RP (Reverse Parallel motor mount)



ITEM	PART NO. OR CONFIG. CODE	DESCRIPTION	QTY
†1.	RLSRS50	LEADSCREW	1
2.	1150-1547	PURGE PORT PLUG	2
3.	1150-1354	BEARING PLATE (U.S. STD)	1
	2150-1354	BEARING PLATE (METRIC)	1
4.	1150-1144	LEADSCREW SLEEVE	1
5.	2133-1022	BEARING	1
6.	2133-1021	RETAINING RING	1
*7.	CONFIGURED	RP MOUNTING PLATE	1
8.	1150-1196	RP MOUNTING PLATE FASTENER	2
9.	2133-1024	KEY	1
10.	1150-1374	ACTUATOR PULLEY 1:1 RATIO	1
	1150-1375	ACTUATOR PULLEY, 2:1 RATIO	1
11.	1150-1114	SPHERICAL WASHER	1
12.	1150-1113	SPHERICAL LOCK NUT	1
13.	2212-1106	RP COVER BOTTOM FASTENER	2
14.	1150-1195	RP COVER TOP FASTENER	4
*15.	CONFIGURED	RP COVER	1
*16.	CONFIGURED	MOTOR PULLEY	1
*17.	CONFIGURED	BELT	1
*18.	CONFIGURED	COLLAR CLAMP	1
*19.	CONFIGURED	SQUARE NUT	4
*20.	CONFIGURED	MOTOR FASTENER	4

* Part number varies depending on YMH (Your Motor Here). Contact help@tolomatic.com for replacement part number

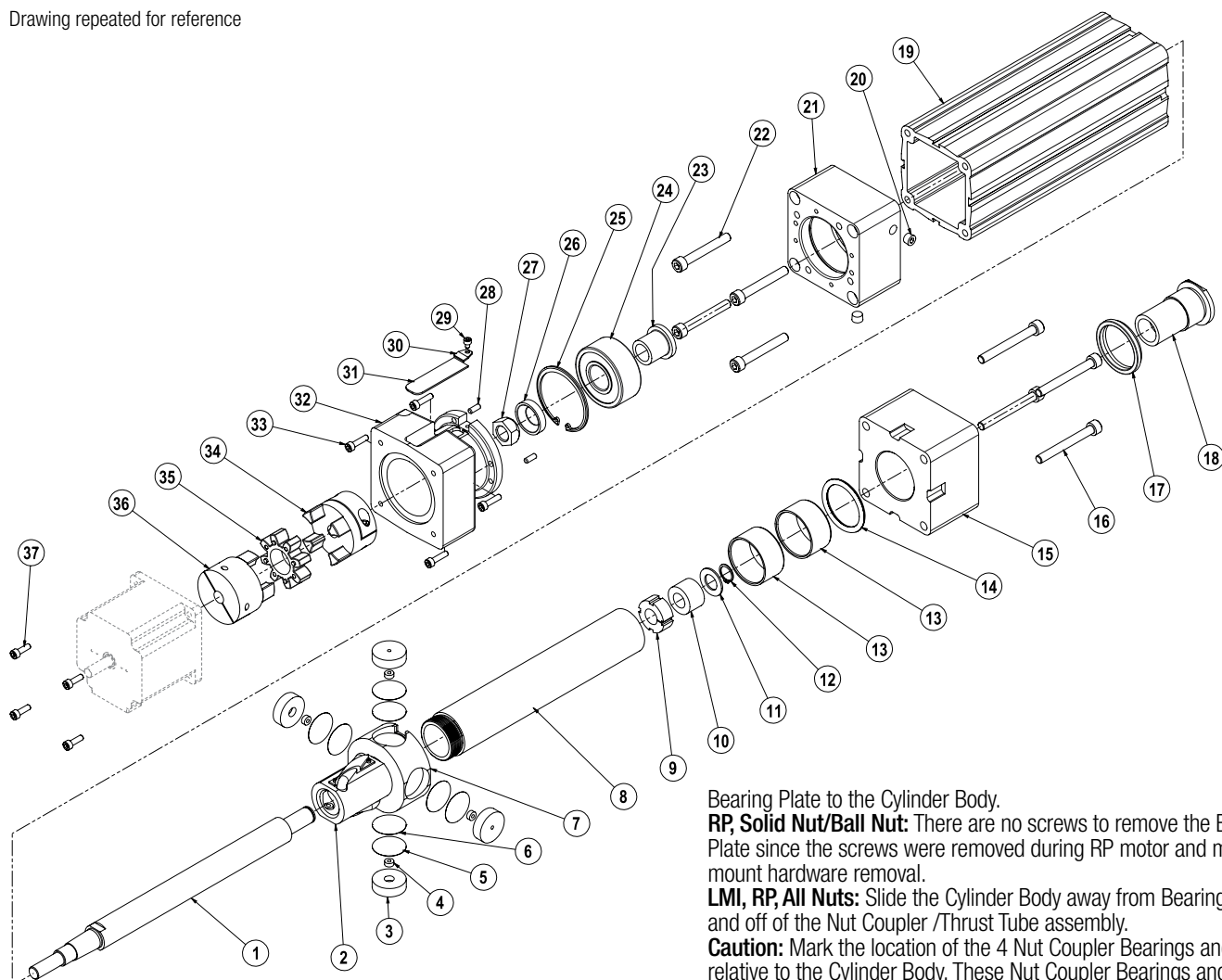
NOTE: Drawing shows components related to RP (reverse parallel) model only. For components not shown above of the RSA ST refer to the LMI (Inline) model listing (page 1).

† Replacement ordering method: **RLS RSA50** **SK** **ST NX**

EXAMPLE: **RLS RSA50 BN04 SK21-25 ST NX** Assembled with Nut ON Leadscrew (required for RN)

Replacement Lead Screw _____ Nut Style & Size _____ Stroke Length _____ High Torque or Standard Torque _____

Drawing repeated for reference



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.

- Allen wrench set
- Socket wrench & socket set
- Retaining ring pliers

1. Remove motor and motor mounting hardware:

LMI, Solid Nut/Ball Nut:

Remove components in the following order:

- 1) Remove Cover by loosening Screw.
- 2) Loosen the coupler screw closest to the actuator.
- 3) Remove Motor Mount Fasteners and Motor/Coupler Assembly
- 4) Remove Motor Spacer Fasteners and Motor Spacer

RP, Solid Nut/Ball Nut:

Disassemble the RP [Reverse Parallel] assembly in the following order:

- 1) Loosen the Motor Mount Fasteners to remove belt tension,
- 2) Remove RP Cover by removing the six Socket Head Cap Screws,
- 3) Remove Belt,
- 4) Remove the motor by removing the Motor Mount Fasteners and the Square Nuts.
- 5) Remove the RP Plate by removing two Socket Head Cap Screws.
Note: the Retaining Ring is part of the RP Plate. A portion of the Bearing will be protruding from the Bearing Plate. The Bearing Plate is no longer secured to the actuator body.

2. Separate Cylinder Body from Bearing Plate:

LMI, All Nuts: Remove the 4 Socket Head Cap Screws that hold the

Bearing Plate to the Cylinder Body.

RP, Solid Nut/Ball Nut: There are no screws to remove the Bearing Plate since the screws were removed during RP motor and motor mount hardware removal.

LMI, RP, All Nuts: Slide the Cylinder Body away from Bearing Plate and off of the Nut Coupler /Thrust Tube assembly.

Caution: Mark the location of the 4 Nut Coupler Bearings and Shims relative to the Cylinder Body. These Nut Coupler Bearings and Shims are fitted at the factory and their orientation is critical when reassembling the actuator.

If needed, the non-motor end Head can also be removed from the Cylinder Body by removing the 4 Socket Head Cap Screws.

3. Remove the Thrust Tube from the Nut Coupler/Housing:

The Thrust Tube is threaded to the Nut Coupler/Housing and held in place with Loctite. To remove the Thrust Tube, slide the O-Ring off the end of the Thrust Tube, then apply heat at the interface between the Nut Coupler/Housing and Thrust Tube, until Loctite becomes pliable enough to release the threads. Place a wrench on the flats of the machined Rod End and turn counterclockwise to unscrew the Thrust Tube from the Nut Coupler/Housing. To remove the Rod End from the Thrust Tube place Thrust Tube into vise, apply heat to the threaded joint to make Loctite pliable then use wrench on flats of Rod End to remove.

4. Remove the Leadscrew from the Nut Assembly:

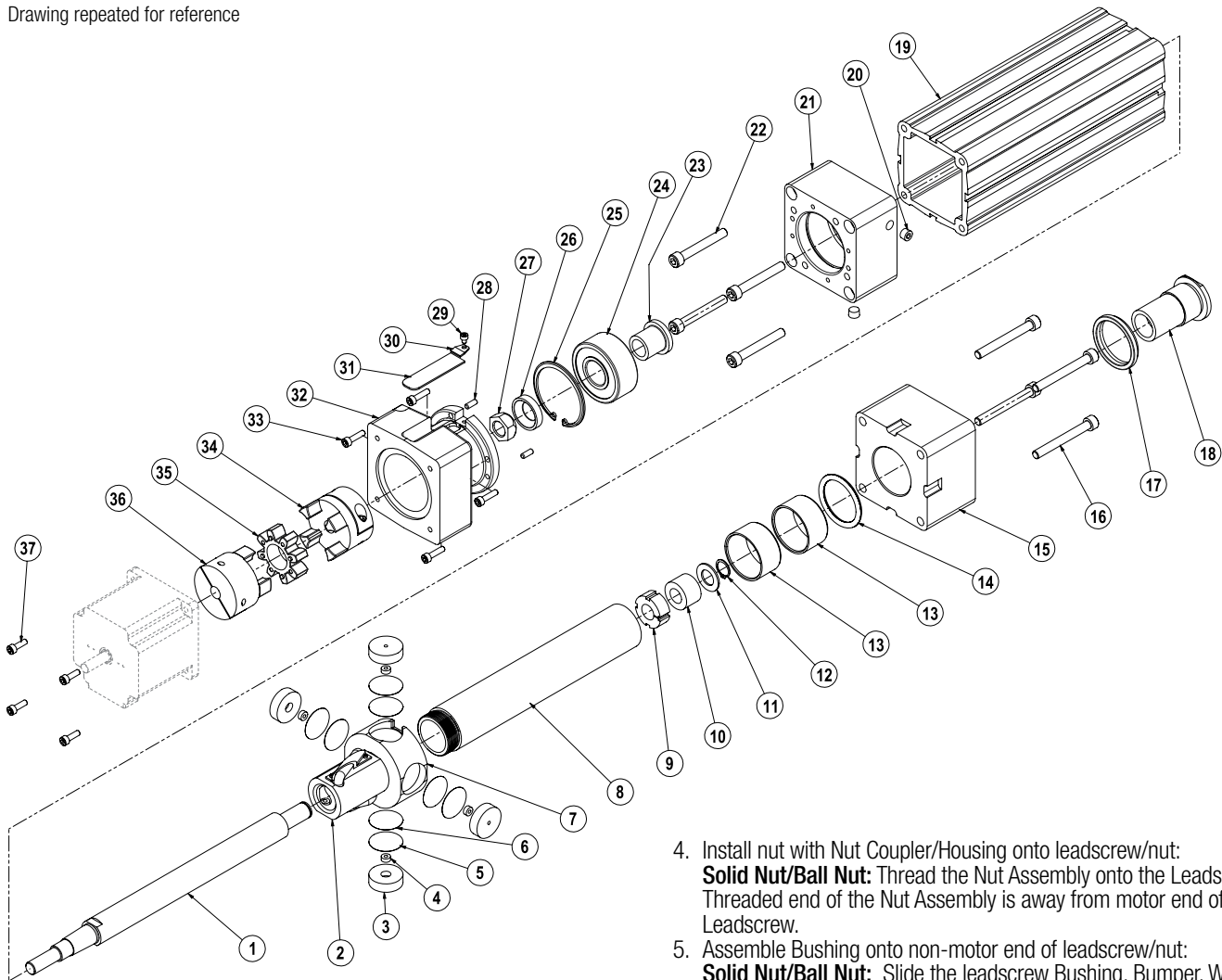
Solid Nut/Ball Nut: Remove the Bearing Sleeve from the Leadscrew.
Ball Nut: *Caution is required if removal of the Nut Assembly or Leadscrew is required. Contact the factory for available parts and procedures.

Solid Nut: The Leadscrew can be threaded out of the Nut Assembly at this point. If leadscrew worn, a new Nut Assembly must be ordered.

5. Remove the Leadscrew from the Bearing Plate:

Secure the body of the Leadscrew in a machinist vice or equivalent smooth jaw vice then remove the Lock Nut. Support the inner race of Bearing and press the Leadscrew out of the Leadscrew Sleeve. There is a mating taper interface between the Leadscrew Sleeve and the Leadscrew.

Drawing repeated for reference



6. Remove Bearing from the Bearing Plate:
Solid Nut/Ball Nut: Remove the Retaining Ring and press the Bearing out of the Bearing Plate as it is secured in place with retaining compound.

ASSEMBLY INSTRUCTIONS

1. Sub-assembly Wiper and Bearing into Head:

Install Wiper with the lip on inside diameter facing outward into the groove in the Head. Press the Bearing Sleeve from opposite end of Head until it is flush to surface of Head.

2. Sub-assemble the Bearing into Bearing Plate:

Solid Nut/Ball Nut: Press Leadscrew Sleeve into main Bearing. Apply Loctite 641 retaining compound to OD of the Bearing and ID of the Bearing Plate and install Bearing into the Bearing Plate. LMI only, install the Snap Ring.

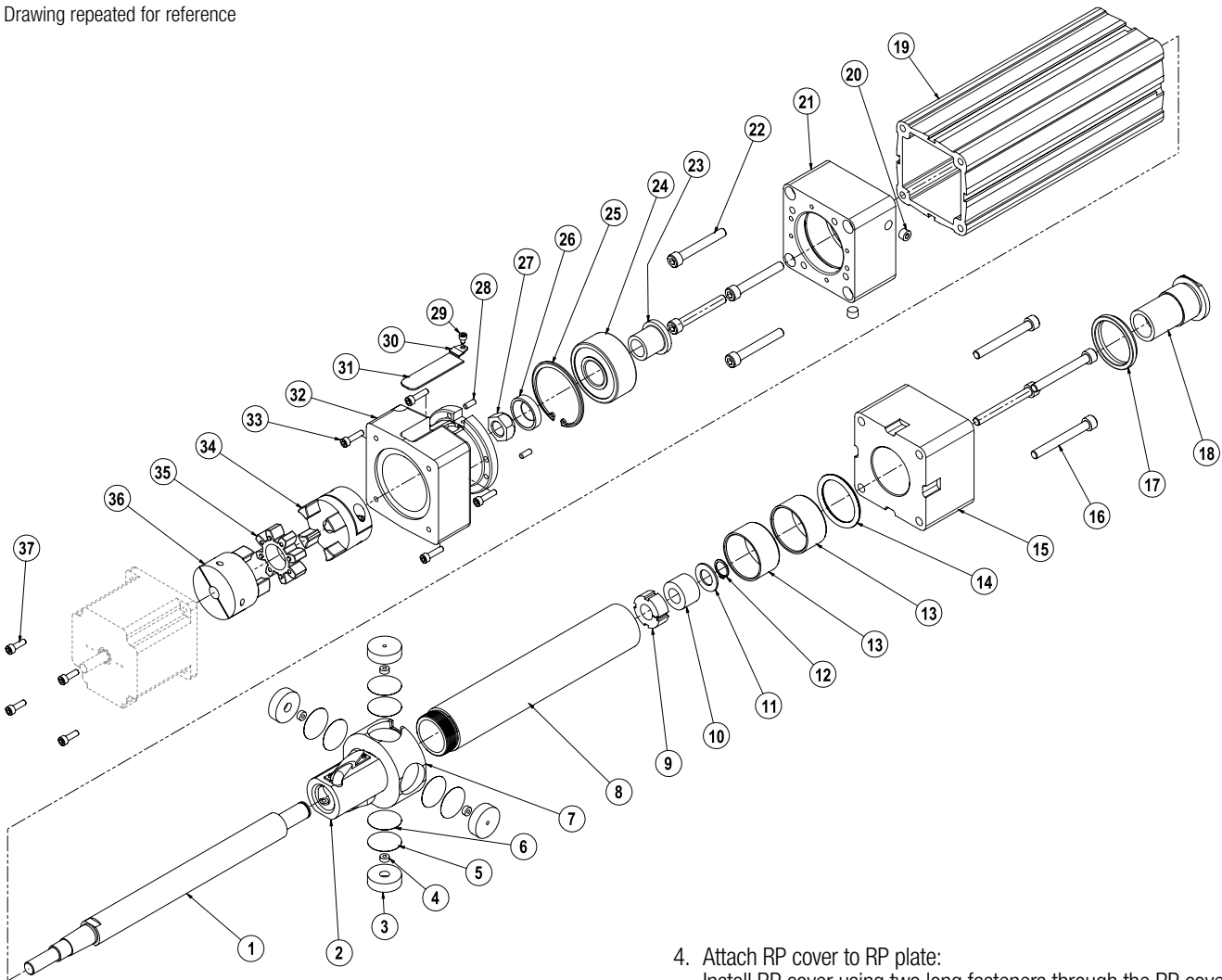
3. Install Bearing Plate assembly onto leadscrew/nut:

LMI, Solid Nut/Ball Nut: Install Leadscrew into the Leadscrew Sleeve in Bearing Plate assembly. Apply Loctite 242 to the threads of the Leadscrew then locate Washer and Locknut over Leadscrew. Torque the Lock Nut to 55 ft-lbs (74.6 N-m), hold Leadscrew in machinist vice as necessary.

RP, Solid Nut/Ball Nut: Install Leadscrew into the Leadscrew Sleeve and apply Loctite 242 to the threads of the Leadscrew. Place Key onto Leadscrew and install the Pulley, Washer, and Lock Nut over Leadscrew. Torque Lock Nut to 55 ft-lbs (74.6 N-m), Hold Leadscrew in machinist vice as necessary.

4. Install nut with Nut Coupler/Housing onto leadscrew/nut:
Solid Nut/Ball Nut: Thread the Nut Assembly onto the Leadscrew. Threaded end of the Nut Assembly is away from motor end of the Leadscrew.
5. Assemble Bushing onto non-motor end of leadscrew/nut:
Solid Nut/Ball Nut: Slide the leadscrew Bushing, Bumper, Washer onto non-motor end of the Leadscrew and secure using Retaining Ring.
6. Grease leadscrew/nut and ID of the Thrust Tube with the following grease:
 • **Ballnut/Roller nut Units:** Mobilith SHC220 grease
 • **Bronze Nut Units:** Chevron SRI NLGI2 grease
 • **Solid Nut Units:** RheoGel TEK 664 grease
 For special lubrication option grease, email help@tolomatic.com
7. Install Thrust Tube onto Nut Coupler/Housing:
 Apply Loctite 270 to OD threads on Thrust Tube and assemble Thrust Tube to Nut Coupler/Housing.
8. Grease ID of Cylinder Body with a coating of appropriate grease, and install leadscrew/nut assembly into the Cylinder Body. *Make sure to orient Nut Housing Bearing with respect to tube the same as were removed.
9. Attach Head and Bearing Plate assembly to the Cylinder Body and align prior to tightening:
LMI, Solid Nut/Ball Nut:
 A. Align motor end Bearing Plate assembly to Cylinder Body with Thrust Tube retracted, and then tighten Socket Head Cap Screws.
 B. Align non-motor end Head to Cylinder Body with Thrust Tube extended, and then tighten Socket Head Cap Screws.
RP, Solid Nut/Ball Nut:
 A. Install the RP Plate through Bearing Plate to Cylinder Body with Thrust Tube retracted, and then tightening two Socket Head Cap Screws into the top two holes in the RP Plate. Install Retaining Ring.
 B. Align non-motor end Head to Cylinder Body with Thrust Tube

Drawing repeated for reference



extended, and then tighten Socket Head Cap Screws.

10. Install Rod End into Thrust Tube:

Solid Nut/Ball Nut: Apply Loctite 271 to threads of the Rod End, install and tighten to the Thrust Tube.

LMI MOTOR ASSEMBLY INSTRUCTIONS

Solid Nut/Ball Nut:

1. Attach Coupler Half onto leadscrew/nut then insert Spider into Coupler Half. Insert the other Coupler Half into the Spider.
2. Install Motor Spacer to Bearing Plate using Motor Spacer Fasteners.
3. Install motor to Motor Spacer using Motor Mount Fasteners. Motor shaft should fit into the ID bore of the Coupler Half. Tighten the Coupler Half onto the motor shaft through access hole in Motor Spacer.
4. Place Cover onto Motor Spacer to cover the access hole. Secure Cover using Clamp and Socket Head Cap Screw.

RSA50ST REVERSE PARALLEL MOTOR ASSEMBLY INSTRUCTIONS

1. Align motor with slots RP Plate. Install four Motor Mount Fasteners through motor and RP Plate then into the four Square Nuts. The Square Nuts must seat into the pockets of the RP Plate. Tighten enough so motor is not drooping but able to move vertically.
2. Align the Collar Clamp with the Motor Pulley and install the Motor Pulley onto the motor shaft by tightening the Collar Clamp fastener. Align motor pulley with the actuator pulley.
3. Slide belt over motor pulley and actuator pulley.

4. Attach RP cover to RP plate:

Install RP cover using two long fasteners through the RP cover, RP plate and bearing plate and into cylinder body. Install the remaining four fasteners into the RP plate.

5. Tension the belt following the procedures for the correct model number found listed in [RP Belt Tensioning 3600-4212](#).

RSA50HT (Roller Nut) REVERSE PARALLEL MOTOR ASSEMBLY INSTRUCTIONS

See Tolomatic document [RP Belt Tensioning 3600-4212](#) for RP motor assembly and belt tension procedure

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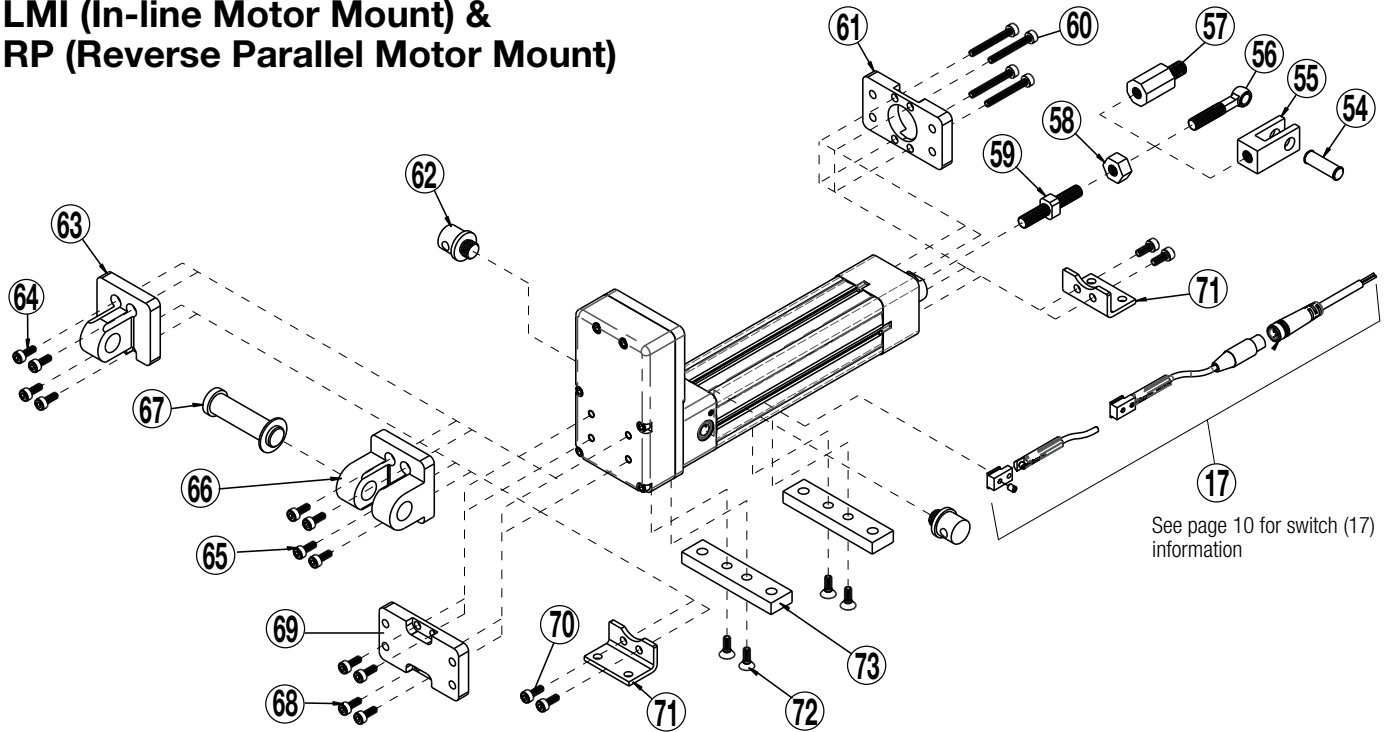
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**Options Parts List:
LMI (In-line Motor Mount) &
RP (Reverse Parallel Motor Mount)**



See page 10 for switch (17) information

			QTY.	
			US CONV (SK)	METRIC (SM)
ROD END CLEVIS (CLV)				
	1150-9029	ROD END CLEVIS	1	
	2150-9049	ROD END CLVS (METRIC)		1
55.	1150-1059	CLEVIS	1	
	2150-1059	CLEVIS		1
58.	2124-1018	JAM NUT	1	
	2124-1023	JAM NUT		1
59.	1150-1057	THREADED ROD END	1	
	2150-1057	THREADED ROD END		1

			QTY.	
			US CONV (SK)	METRIC (SM)
ALIGNMENT COUPLER (ALC)				
57.	1150-1060	ALIGNMENT COUPLER	1	
	2150-1060	ALIGNMENT COUPLER		1

			QTY.	
			US CONV (SK)	METRIC (SM)
SPHERICAL ROD EYE (SRE)				
	1150-9028	SPHERICAL ROD EYE	1	
	2150-9048	SPHRCL ROD EYE (METRIC)		1
56.	1150-1058	ROD END BEARING	1	
	2150-1058	ROD END BEARING		1
58.	2124-1018	JAM NUT	1	
	2124-1023	JAM NUT		1
59.	1150-1057	THREADED ROD END	1	
	2150-1057	THREADED ROD END		1

			QTY.	
			US CONV (SK)	METRIC (SM)
EXTERNALLY THREADED ROD END (MET)				
59.	1150-1057	THREADED ROD END	1	
	2150-1057	THREADED ROD END		1

			QTY.	
			US CONV (SK)	METRIC (SM)
FRONT FLANGE (FFG)				
	1150-9022	FRONT FLANGE KIT	1	
	2150-9042	FRNT FLNG KIT (METRIC)		1
60.	3420-1081	SOCKET HD CAP SCREW	4	
	2212-1104	SOCKET HD CAP SCREW		4
61.	1150-1052	FLANGE PLATE	1	
	2150-1052	FLANGE PLATE		1

			QTY.	
			US CONV (SK)	METRIC (SM)
TRUNNION MOUNT (TRR)				
62.	1150-1051	TRUNNION PIVOT PIN	2	
	2150-1051	TRUNNION PIVOT PIN		2

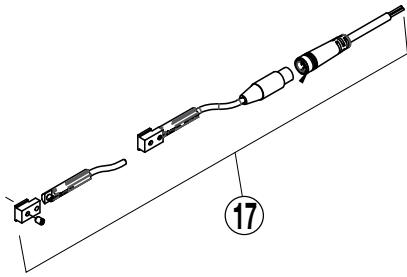
			QTY.	
			US CONV (SK)	METRIC (SM)
EYE MOUNT (PCS)				
	1150-9024	EYE MOUNT	1	
	2150-9044	EYE MOUNT (METRIC)		1
63.	1150-1054	EYE BRACKET	1	
	2150-1054	EYE BRACKET		1
64.	2124-1075	SOCKET HD CAP SCREW	4	
	2164-1065	SOCKET HD CAP SCREW		4

			QTY.	
			US CONV (SK)	METRIC (SM)
CLEVIS MOUNT (PCD)				
	1150-9025	CLEVIS MOUNT	1	
	2150-9045	CLEVIS MOUNT (METRIC)		1
65.	2124-1075	SOCKET HD CAP SCREW	4	
	2164-1065	SOCKET HD CAP SCREW		4
	1150-1055	CLEVIS	1	
66.	2150-1055	CLEVIS		1
67.	1150-1056	CLEVIS PIN	1	
	2150-1056	CLEVIS PIN		1

			QTY.	
			US CONV (SK)	METRIC (SM)
BACK FLANGE (BFG)				
	1150-9022	REAR FLANGE KIT	1	
	2150-9042	REAR FLNG KIT (METRIC)		1
68.	3420-1081	SOCKET HD CAP SCREW	4	
	2212-1104	SOCKET HD CAP SCREW		4
69.	1150-1052	FLANGE PATE	1	
	2150-1052	FLANGE PATE		1

			QTY.	
			US CONV (SK)	METRIC (SM)
FOOT MOUNT (FM2)				
	1150-9020	FOOT MOUNT	1	
	2150-9040	FOOT MOUNT (METRIC)		1
70.	0925-1102	SOCKET HD CAP SCREW	4	
	2150-1103	SOCKET HD CAP SCREW		4
71.	1150-1050	FOOT MOUNT BRACKET	2	
	2150-1050	FOOT MOUNT BRACKET		2

			QTY.	
			US CONV (SK)	METRIC (SM)
MOUNTING PLATE (MP2)				
	1150-9023	MOUNTING PLATE	1	
	2150-9043	MOUNTING PLATE (METRIC)		1
72.	2224-1010	FLAT HEAD CAP SCREW	4	
	3224-1010	FLAT HEAD CAP SCREW		4
73.	1150-1053	TUBE SUPPORT BRACKET	2	
	2150-1053	TUBE SUPPORT BRACKET		2



To order switch kits use configuration code for switch preceded by SW and actuator code.

EXAMPLE: **SWRSAL12RK3**

SW	RS	AL	12	RK	3
KIT	ACTUATOR	SIZE	SWITCH CODE	QUANTITY	

The example is for 3 Solid State NPN, Normally Open Switches with Quick-disconnect couplers. Each switch is complete with Bracket, Set Screw, Switch and mating QD cable. Note that the bracket/switch size is common and may be used on any size RSA.

ITEM	ORDER CODE	LEAD	SENSOR TYPE	SWITCHING LOGIC	POWER LED	SIGNAL LED	OPERATING VOLTAGE	**POWER RATING (WATTS)	SWITCHING CURRENT (MA MAX.)	CURRENT CONSUMPTION	VOLTAGE DROP	LEAKAGE CURRENT	TEMP. RANGE	SHOCK / VIBRATION
17.	R Y	5M	REED	SPST NORMALLY OPEN	—	RED	5 - 240 AC/DC	**10.0	100MA	—	3.0 V MAX.	—	14 TO 158°F [-10 TO 70°C]	50 G / 9 G
	R K	QD*												
	N Y	5M		SPST NORMALLY CLOSED	—	YELLOW	5 - 110 AC/DC							
	N K	QD*												
	T Y	5M	SOLID STATE	PNP (SOURCING) NORMALLY OPEN	GREEN	YELLOW	10 - 30 VDC	**3.0	100MA	20 MA @ 24V	2.0 V MAX.	0.05 MA MAX.		
	T K	QD*												
	K Y	5M		NPN (SINKING) NORMALLY OPEN	GREEN	RED								
	K K	QD*												
	P Y	5M		PNP (SOURCING) NORMALLY CLOSED	GREEN	YELLOW								
	P K	QD*												
	H Y	5M		NPN (SINKING) NORMALLY CLOSED	GREEN	RED								
	H K	QD*												
SWITCH BRACKET, SET SCREW & MATING QD CABLE IS INCLUDED														

*QD = Quick-disconnect Enclosure classification IEC 529 IP67 (NEMA 6) CABLES: Robotic grade, oil resistant polyurethane jacket, PVC insulation

**WARNING: Do not exceed power rating (Watt = Voltage x Amperage). Permanent damage to sensor will occur.

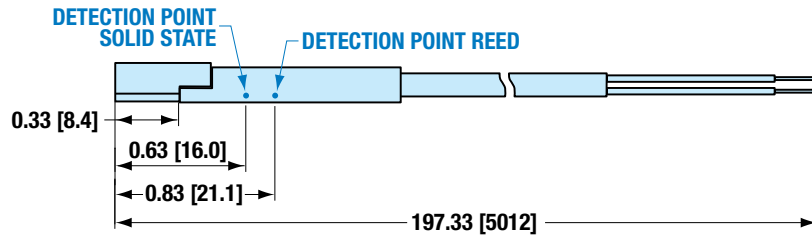
SWITCH INSTALLATION



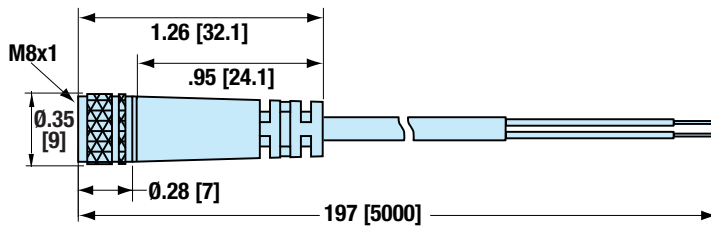
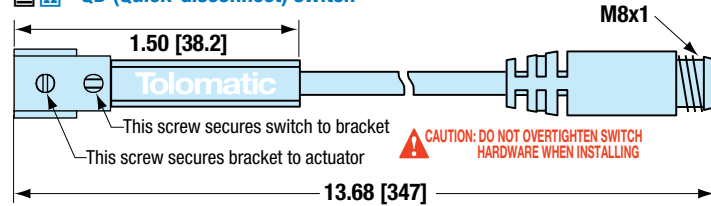
Place switch bracket into one of the four slots that run the length of the extruded tube. Note that there is a cutout on the actuator head (RSA) or tube (GSA) to allow insertion of the bracket. Insert the switch with the word "Tolomatic" facing up and slide it under the bracket. Position the bracket with the switch to the exact location desired, then lock them securely into place by tightening both set screws on the bracket.

SWITCH DIMENSIONS

- direct connect

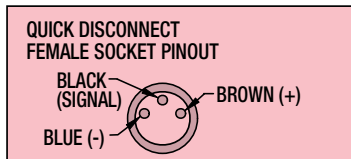
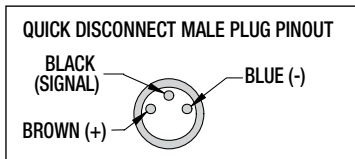
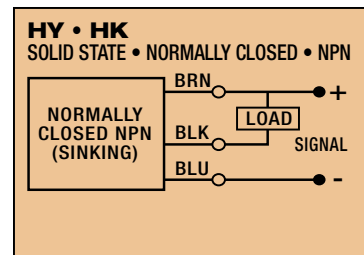
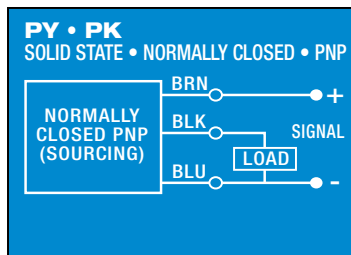
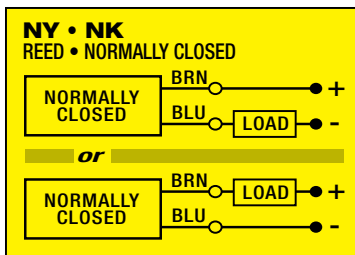
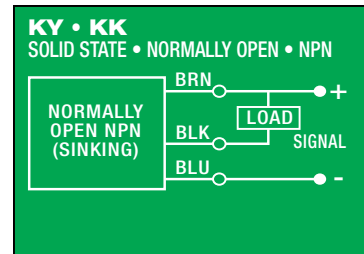
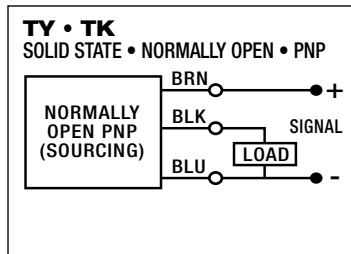
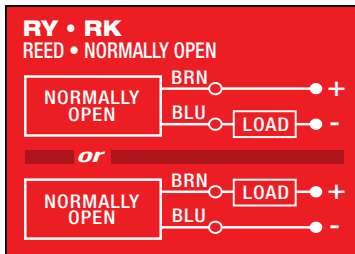


- QD (Quick-disconnect) switch



Dimensions in inches [brackets indicate dimensions in millimeters]

SWITCH WIRING DIAGRAMS AND LABEL COLOR CODING (CE and RoHS Compliant)



Switches:

- Include retained mounting hardware
- In slot, sit below extrusion profile
- Same for all sizes



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