

EXAMPLE: RIS RSA24 SNO1 SK21 · 25 YM

Replacement Lead Screw Model & Size

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Nut Style & Size Stroke Length LMotor Code

Toll Free: 1-800-328-2174

BNM05 BALLNUT

BNM10 BALLNUT

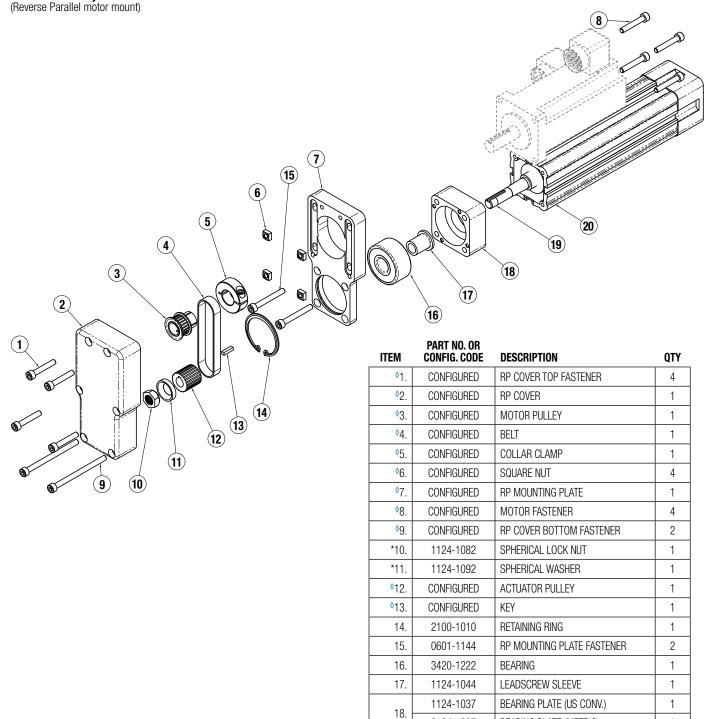
BZ10 BRONZE NUT

2100-1061

2192-1096

2124-1032

# Solid Nut, Ball Nut RP



**LEADSCREW** 

CYLINDER BODY

BEARING PLATE (METRIC)

2124-1037

RLSRSA24

RTBRSA24

† Replacement ordering method: RIS RIS A 24 CONTROL SKILL YM EXAMPLE: RIS RSA24 SN01 SK21 25 YM Replacement Lead Screw Nut Style & Size Model & Size Stroke Length LMotor Code

† 19.

† 20.

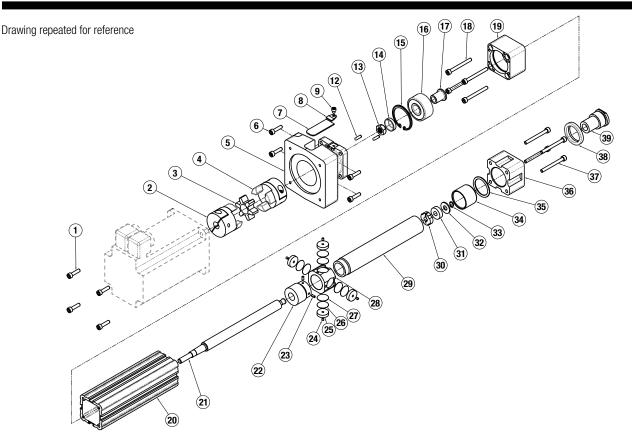
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<sup>\*</sup>These parts are not compatible with actuators manufactured before January 2003.

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



### **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: (Note: Reference parts list from page 1, 2.) Remove components in the following order:

- 1) Remove Motor Spacer Cover (7) by loosening Cover Fastener (9).
- 2) Loosen the coupler screw closest to the actuator.
- 3) Remove Motor Mount Fasteners (1) and Motor/Coupler Assembly (2, 3, 4)
- 4) Remove Motor Spacer Fasteners (6) and Motor Spacer (5)

**RP, Solid Nut/Ball Nut:** (Note: Reference parts list from page 2 whenever instructions refer to RP with Solid Nut/Ball Nut.) Disassemble the RP [Reverse Parallel] assembly in the following order:

- 1) Loosen the Motor Mount Fasteners (8) to remove belt tension,
- 2) Remove RP Cover (2) by removing the six Socket Head Cap Screws (1,9),
- 3) Remove Belt (4),
- 4) Remove the motor by removing the Motor Mount Fasteners (8) and the Square Nuts (6).
- 5) Remove the RP Plate (7) by removing two Socket Head Cap Screws (15). Note: the Retaining Ring (14) is part of the RP Plate. A portion of the Bearing (16) will be protruding from the Bearing Plate (18). The Bearing Plate (18) is no longer secured to the actuator body.
- 2. Separate Cylinder Body (20) from Bearing Plate (19):

**LMI, All Nuts:** Remove the 4 Bearing Plate Fasteners (18) that hold the Bearing Plate (19) to the Cylinder Body (20).

RP, Solid Nut/Ball Nut: (Note: Reference parts list from page 2 whenever instructions refer to RP with Solid Nut/Ball Nut.) There are no screws to remove the Bearing Plate (18) since the screws were removed during RP motor and motor mount hardware removal.

LMI, RP, All Nuts: Slide the Cylinder Body (20) away from Bearing Plate (19) and off of the Nut Coupler (28) /Thrust Rod (29) assembly.

**Caution:** Mark the location of the 4 Nut Coupler Bearings (25) and Shims (26,27) relative to the Cylinder Body (20). These Nut Coupler Bearings (25) and Shims (26,27) are fitted at the factory and their orientation is critical when reassembling the actuator.

If needed, the Front Head (36) can also be removed from the Cylinder Body (20) by removing the 4 Front Head Fasteners (37).

3. Remove the Thrust Rod (29) from the Nut Coupler (28):

The Thrust Rod (29) is threaded to the Nut Coupler (28) and held in place with Loctite. To remove the Thrust Rod (29), slide the O-Ring (35) off the end of the Thrust Rod (29), then apply heat at the interface between the Nut Coupler (28) and Thrust Rod (29), until Loctite becomes pliable enough to release the threads. Place a wrench on the flats of the machined Rod End (39) and turn counterclockwise to unscrew the Thrust Rod (29) from the Nut Coupler (28). To remove the Rod End (39) from the Thrust Rod (29), place Thrust Rod (29) into vise, apply heat to the threaded joint to make Loctite pliable then use wrench on flats of Rod End (39) to remove.

I. Remove the Leadscrew (21) from the Nut (22) assembly:

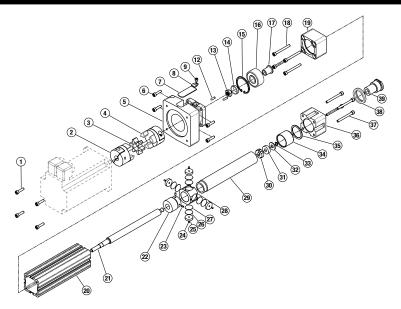
Solid Nut/Ball Nut: Remove the Front Bushing (34) from the Leadscrew (21). Ball Nut: \*Caution is required if removal of the Nut (22) or Leadscrew (21) is required. Contact the factory for available parts and procedures.

**Solid Nut:** The Leadscrew (21) can be threaded out of the Nut (22) at this point. The leadscrew Nut (22) and Nut Coupler (28) are pinned and secured with Loctite at the factory. If leadscrew Nut (22) is worn, a new Nut Assembly (22-28) must be ordered.

- 5. Remove the Leadscrew (21) from the Bearing Plate (19): Secure the body of the Leadscrew (21) in a machinist vice or equivalent smooth jaw vice then remove the Spherical Nut (13). NOTE: Spherical Nut (13) for the Leadscrew (21) requires special tooling for removal. For a Leadscrew (21), remove the Spherical Washer (14). Support the inner race of Bearing (16) and press the Leadscrew (21) out of the Leadscrew Sleeve (17). There is a mating taper interface between the Leadscrew Sleeve (17) and the Leadscrew (21).
- Remove Bearing (16) from the Bearing Plate (19):
   Solid Nut/Ball Nut: Remove the Retaining Ring (15) and press the Bearing (16) out of the Bearing Plate (19) as it is secured in place with retaining compound.

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Drawing repeated for reference



#### **ASSEMBLY INSTRUCTIONS**

- Sub-assemble Wiper (38) and Front Bushing (34) into Front Head (36): Install Wiper (38) with the lip on inside diameter facing outward into the groove in the Front Head (36). Press the Front Bushing (34) from opposite end of Front Head (36) until it is flush to surface of Front Head (36).
- Sub-assemble the Bearing (16) into Bearing Plate (19):
   Solid Nut/Ball Nut: Press Leadscrew Sleeve (17) into main Bearing (16). Apply Loctite 641 retaining compound to OD of the Bearing (16) and ID of the Bearing Plate (19) and install Bearing (16) into the Bearing Plate (19). LMI only, install the Retaining Ring (15).
- 3. Install Bearing Plate (19) assembly onto leadscrew/nut: LMI, Solid Nut/Ball Nut: Install Leadscrew (21) into the Leadscrew Sleeve (17) in Bearing Plate (19) assembly. Apply Loctite 242 to the threads of the Leadscrew (21) then locate Spherical Washer (14) and Spherical Nut (13) over Leadscrew (21). Torque the Spherical Nut (13) to 200 in-lbs, hold Leadscrew (21) in machinist vice as necessary.
  - RP, Solid Nut/Ball Nut: (Note: Reference parts list from page 2 whenever instructions refer to RP with Solid Nut/Ball Nut.) Install Leadscrew (21) into the Leadscrew Sleeve (17) and apply Loctite 242 to the threads of the Leadscrew (21). Place Key (13) onto Leadscrew (21) and install the Pulley (12), Washer (11), and Spherical Nut (10) over Leadscrew (21). Torque Spherical Nut (10) to 200 in-lbs. Hold Leadscrew (21) in machinist vice as necessary.
- 4. Install nut with Nut Coupler (28) onto leadscrew/nut:
  - **Solid Nut/Ball Nut:** Thread the Nut (22) assembled to the Nut Coupler (28) onto the Leadscrew (21). Threaded end of the Nut Coupler (28) is away from motor end of the Leadscrew (21).
- Assemble Bushing (30) onto non-motor end of leadscrew/nut:
   Solid Nut/Ball Nut: Slide the leadscrew Bushing (30), Bumper (31), Washer (32) onto non-motor end of the Leadscrew (21) and secure using Retaining Ring (33).
- **6.** Grease leadscrew/nut and ID of the Thrust Rod (29) with the following grease:
  - Ballnut Units: Mobilith SHC220 grease
  - Bronze Nut Units: Cheveron SRI NLGI2 grease
  - Solid Nut Units: RheoGel TEK 664 grease

For special lubrication option grease, email help@tolomatic.com

- 7. Install Thrust Rod (29) onto Nut Coupler (28):
  - Apply Loctite 270 to OD threads on Thrust Rod (29) and assemble Thrust Rod (29) to Nut Coupler (28).
- Grease ID of Cylinder Body (20) with a coating of appropriate grease, and install leadscrew/nut assembly into the Cylinder Body (20). \*Make sure to orient Nut Coupler Bearing (25) with respect to tube the same as were removed.
- Attach Front Head (36) and Bearing Plate (19) assembly to the Cylinder Body (20) and align prior to tightening:

# LMI, Solid Nut/Ball Nut:

**A.** Align motor end Bearing Plate (19) assembly to Cylinder Body (20) with Thrust Rod (29) retracted, and then tighten Bearing Plate Fasteners (18).

**B.** Align non-motor end Front Head (36) to Cylinder Body (20) with Thrust Rod (29) extended, and then tighten Front Head Fasteners (37).

#### RP, Solid Nut/Ball Nut:

**A.** (Note: Reference parts list from page 2 whenever instructions refer to RP with Solid Nut/Ball Nut.) Install the RP Plate (7) through Bearing Plate Fasteners (18) to Cylinder Body (20) with Thrust Rod (29) retracted, and then tightening two Socket Head Cap Screws (15) into the top two holes in the RP Plate (7). Install Retaining Ring (14).

**B.** (See page 1, 2 parts list for this step.) Align non-motor end Front Head (36) to Cylinder Body (20) with Thrust Rod (29) extended, and then tighten Front Head Fasteners (37).

10. Install Rod End (39) into Thrust Rod (29):

**Solid Nut/Ball Nut:** Apply Loctite 271 to threads of the Rod End (39), install and tighten to the Thrust Rod (29).

## LMI MOTOR ASSEMBLY INSTRUCTIONS

- Attach Actuator Coupler Half (4) onto leadscrew/nut then insert Spider (3) into Actuator Coupler Half (4). Insert the other Coupler Half (2) into the Spider (3).
- Install motor to Motor Spacer (5) using Motor Mount Fasteners (1). Motor shaft should fit into the ID bore of the Coupler Half (2). Tighten the Coupler Half (2) onto the motor shaft through access hole in Motor Spacer (5).
- Place Motor Spacer Cover (7) onto Motor Spacer (5) to cover the access hole.Secure Motor Spacer Cover (7) using Clamp Cover (8) and Cover Fastener (9).

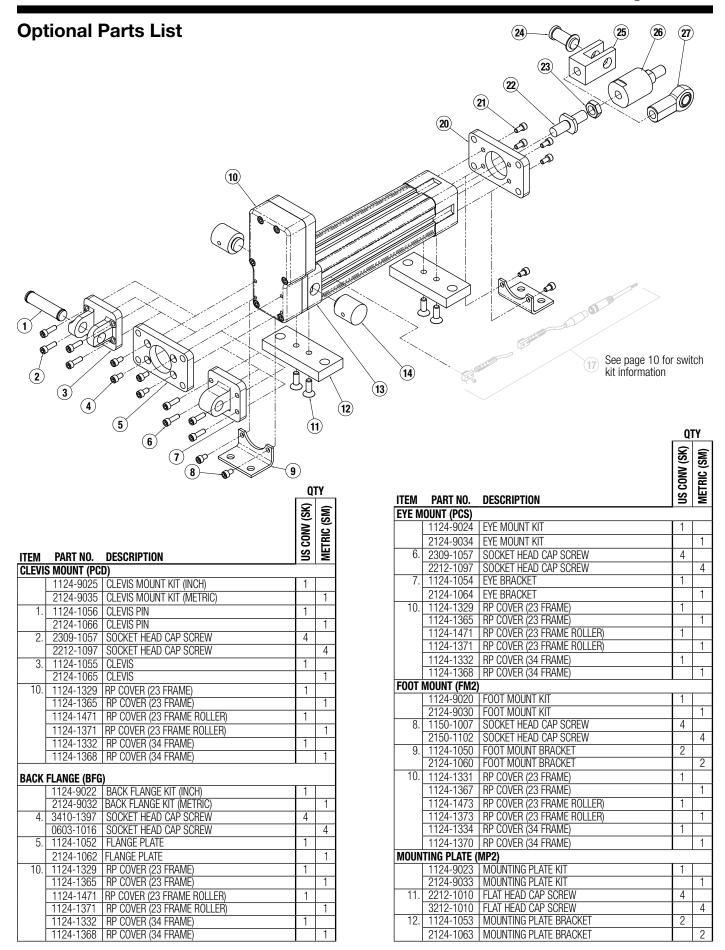
# RSA24ST REVERSE PARALLEL MOTOR ASSEMBLY INSTRUCTIONS

(Note: Reference parts list from page 2 whenever instructions refer to RP with Solid Nut/Ball Nut.)

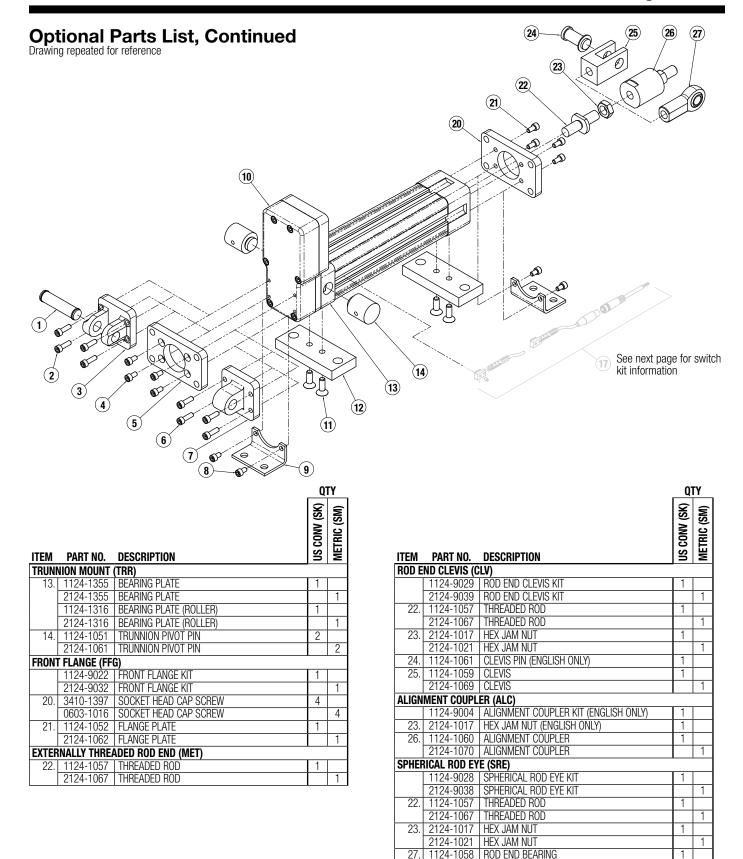
- Align motor with slots RP Plate (7). Install four Motor Mount Fasteners (8) through
  motor and RP Plate (7) then into the four Square Nuts (6). The Square Nuts (6)
  must seat into the pockets of the RP Plate (7). Tighten enough so motor is not
  drooping but able to move vertically.
- Align the Collar Clamp (5) with the Motor Pulley (3) and install the Motor Pulley (3) onto the motor shaft by tightening the Collar Clamp (5) fastener. Align motor pulley with the actuator pulley (12).
- 3. Slide belt (4) over motor pulley (3) and actuator pulley (12).
- 4. Attach RP cover (2) to RP plate (7):
  - **Solid Nut/Ball Nut:** Install RP cover (2) using two long fasteners (9) through the RP cover, RP plate and bearing plate (18) and into cylinder body (20). Install the remaining four fasteners (1) into the RP plate.
- Tension the belt following the procedures for the correct model number found listed in RP Belt Tensioning 3600-4212.

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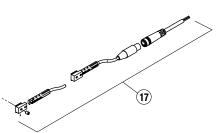
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2124-1068 ROD END BEARING



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

EXAMPLE: SWRSA24KK SWITCH CODE ACTUATOR

The example is for a Solid State NPN, Normally Open Switch with Quick-disconnect coupler. 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.

ІТЕМ	ORDER CODE	LEAD	SENSOR TYPE	SWITCHING LOGIC	POWER LED	SIGNAL Led	OPERATING Voltage	**POWER RATING (WATTS)	SWITCHING CURRENT (MA MAX.)	CURRENT Consump- Tion	VOLTAGE DROP	LEAKAGE CURRENT	TEMP. RANGE	SHOCK / VIBRATION
	RY	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
17.	RK	QD*			Tolomatio	81009082								
	NY	5M		SPST NOR- MALLY	_	YELLOW	5 - 110 AC/DC							
	NK	QD*		CLOSED	Tolomatio	C 0 81009084								
	ΤY	5M	SOLID STATE	PNP (SOURC- ING)	GREEN	YELLOW	ED 10 - 30 VDC	**3.0	100MA	20 MA @ 24V	2.0 V MAX.	0.05 MA MAX.		
	TK	QD*		NORMALLY OPEN	Tolomatio	C 81009088								
	KY	5M		NPN (SINKING)	GREEN	RED								
	KK	QD*		NORMALLY OPEN	<b></b> Tolomatio	81009090								
	PY	5M		PNP (SOURC- ING)	GREEN	YELLOW								
	PK	QD*		NORMALLY CLOSED	Tolomatio	C 81009092								
	HY	5M		NPN (SINKING)		RED								
	HK	QD*		NORMALLY CLOSED	Tolomatio	C 81009094								
				SV	VITCH BRACI	KET, SET SCI	REW & N	MATING QD	CABLE IS IN	ICLUDED				

\*QD = Quick-disconnectEnclosure 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**

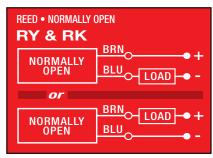


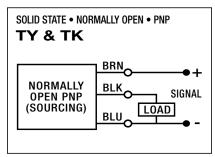
Place switch bracket into one of the four slots that run the length of the extruded tube. Note that there is a cutout on the actuator head (RSA) or tube (GSA) to allow insertion of the bracket. Insert the switch with the word "Tolomatic" facing up and slide it under the bracket. Position the bracket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

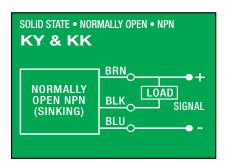
# **SWITCH DIMENSIONS** Y - direct connect **DETECTION POINT** SOLID STATE DETECTION POINT REED 0.33 [8.4] 0.63 [16.0] ←0.83 [21.1] → - 197.33 [5012] \_ K - QD (Quick-disconnect) switch M8x1 1.50 [38.2] ╜╽ 几月 This screw secures switch to bracket This screw secures bracket to actuator 13.68 [347] - QD Cable 1.26 [32.1] M8x1 .95 [24.1] [9] −Ø.28 [7] 197 [5000]

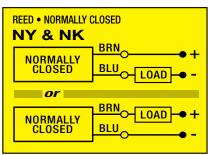
Dimensions in inches [brackets indicate dimensions in millimeters]

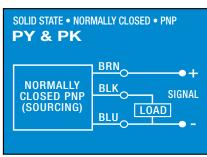
### SWITCH WIRING DIAGRAMS AND LABEL COLOR CODING (CE and RoHS Compliant)

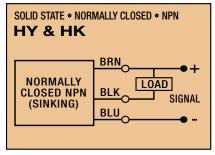


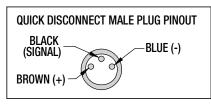


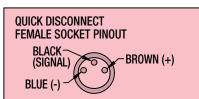












#### Switches:

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



COMPANY WITH QUALITY SYSTEM CERTIFIED BY DNV = ISO 9001 =

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