

## LACPACC Linear Actuator Assembly Repair Kit Instructions

### For SureMotion® LACP2 Series Compact-Slide Linear Actuator Assemblies

#### REPAIR KITS COVERED BY THESE INSTRUCTIONS

Repair Kit Product Compatibility	
Repair Kit #	Linear Actuator Assembly #
LACPACC-006	LACP2-16TxxLP5 (0.5-in lead screw pitch)
LACPACC-007	LACP2-16TxxL1 (1-in lead screw pitch)



**WARNING:** BEFORE REPAIR IS PERFORMED, ALL ELECTRICAL POWER TO THE SYSTEM COMPONENTS SHOULD BE REMOVED, AND THE PAYLOAD MUST BE REMOVED FROM THE CARRIAGE. FOR EASE OF REPAIR, THE SYSTEM SHOULD IDEALLY BE DETACHED FROM ITS MOUNTING SUBSTRATE.

#### COMPONENT PARTS INCLUDED IN THE REPAIR KIT

- 2 ea Flanged Bearings 6mm ID, 17mm OD
- 1 ea Slide Liner
- 2 ea Flat Head Cap Screw
- 1 ea Lead Screw Nut
- 1 ea Lubrication Pen Applicator



#### TOOLS

##### REQUIRED TOOLS

- Allen wrenches - 1.5 mm, 2.5 mm, 5/64"
- Allen wrench for removing shaft coupler (2.5 mm allen wrench for standard coupler factory-included with actuator)
- Wrenches for removing motor mounting fasteners (typically 2.5 mm or 3/32" allen wrenches, respectively, for M3 or #4 socket head screws used with NEMA 17 motors, and 5/32" allen wrench for #10 socket head cap screws used with NEMA 23 motors)
- Loctite 425 threadlocker fluid
- Cleaning towels
- Safety glasses

##### OPTIONAL TOOLS

- Adjustable or 12mm open end wrench
- Torque wrench with 6 in-lb measurement capability
- 5/64" hex bit for torque wrench
- Cleaning fluids (acetone or isopropyl alcohol recommended)
- Cleaning gloves

#### TORQUE SPECIFICATIONS

Standard Steel Bolt/Screw Torque Specifications				
Bolt/Screw			Torque*	
Size	Pitch	Type	lb-in	lb-ft
6	32	Low Carbon Steel	8.7	-
8	32		17.8	
10	24		20.8	
1/4	20	SAE Grade 5 Med. Carbon Steel	-	10
5/16	18		-	19
3/8	16		-	33
7/16	14		-	54
1/2	13	-	-	78

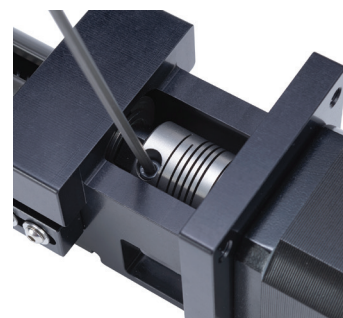
\* It is recommended to use 50% of listed torque when using steel threads into aluminum material.

Metric Steel Bolt/Screw Torque Specifications			
Bolt/Screw			Torque*
Size	Pitch	Type	N-m
M3	0.5	Standard 5D Med. Carbon Steel	0.6
M4	0.7		1.5
M5	0.8		3.0
M6	1.0		5.2
M8	1.0		12.5

\* It is recommended to use 50% of listed torque when using steel threads into aluminum material.

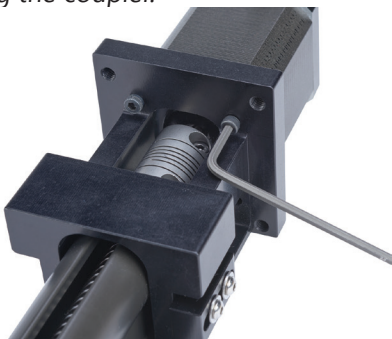
#### ACTUATOR DISASSEMBLY

- 1) Loosen the drive coupler collar lock with a 2.5 mm hex key.



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- 2) Loosen the 4 mounting fasteners at the motor using a hex key. Remove the motor assembly including the coupler.

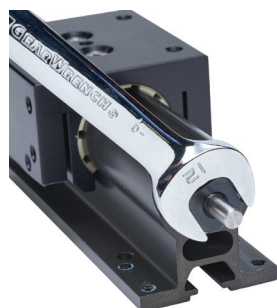


- 3) Loosen the lock nut set screw at the idler end using a 1.5 mm hex key. Do not remove the set screw completely. Just loosen the set screw 1 or 2 complete turns.

**Note:** There is a small brass crush pad in the lock nut under the set screw. Be sure that it is in place before tightening set screws.

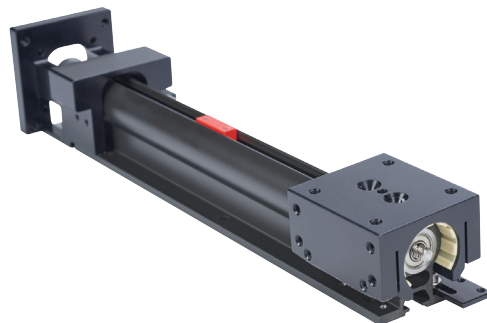


- 4) Using finger grip, or a 12mm open end wrench, unscrew and remove the lock nut from the lead screw. Hold the carriage steady while turning the nut.



- 5) Remove the lead screw drive nut from the carriage using a 5/64-in hex key. Discard the screws.

- 6) Remove the carriage from the rail tube by sliding off the end.

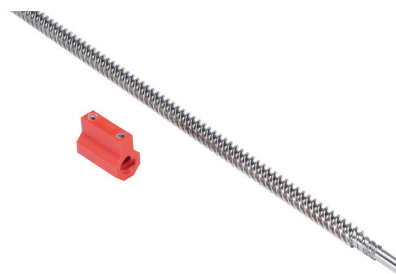


- 7) Pull the lead screw and lead nut out of the base from the drive end. Remove and discard the lead nut. Remove and discard all bearings. Remove the slide bushing insert from the carriage.

- 8) Clean all components and remove any debris or accumulated contaminants. Inspect and clean the carriage block, lead screw, and slide tube. All anodized aluminum parts can be cleaned with alcohol or acetone. Avoid contact of cleaning fluid on the slide bushing liner and lead screw drive nut.

### ACTUATOR ASSEMBLY

- 9) Install the lead screw nut on the lead screw. Apply lubricant to the screw. Spin the lead nut the full length of the lead screw to check for tightness. Clean any debris that may cause tightness.



- 10) Install a new bearing on the drive end of lead screw and fix it in place with one of the lock nuts. Firmly tighten set screw.

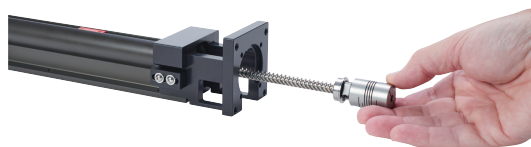
**Note:** There is a small brass crush pad in the lock nut under the set screw. Be sure that it is in place before tightening set screws.

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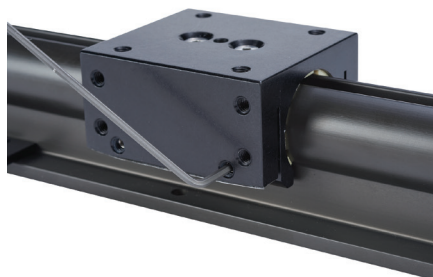
- 11) Install the new slide bushing liner. Be sure the tab on the back is properly seated in the slide.



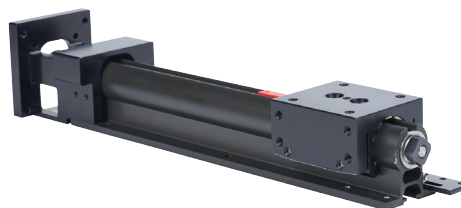
- 12) Move the lead screw nut to the idler end of the lead screw and insert the lead screw into the motor side of the base. Once the lead screw is fully inserted, ensure that the main body of the drive end bearing is fully seated in the inner diameter of the base's tubular section.



- 13) Install the other flange bearing on the idler end of the lead screw.
- 14) Thread the remaining lock nut onto the idler end of the lead screw. Tighten it by hand just enough to keep the lead screw tensioned. Do not tighten the set screw yet.
- 15) With a 2mm hex key, loosen the two side adjusting screws. Loosen one full turn each. Repeat for the other two side adjusting screws on the opposite side.



- 16) Carefully slide the carriage onto the slide tube.



- 17) Once the carriage is on the slide tube, vigorously move the carriage to seat the slide bushing and insure alignment.

**ADJUSTING THE SLIDE BUSHING BEARINGS.**

At this point, the carriage should move freely along the full length of the actuator tube. If a few tight spots are encountered, we will adjust these as we progress.

The slide bushing is very sensitive to pre-load so adjustments must be made in very small increments. Finesse and feel are important in this process. There are no hard and fast numbers to adjust to and the type of pre-load you introduce should be based upon your application needs.

For extremely fast operations where efficiency is critical, a loose fit is appropriate. For applications where rigidity is more important, a tighter fit and feel is appropriate. For applications in the middle range your subjective feel comes into play to achieve the ultimate performance. Remember, the tighter the pre-load, the more rapid the wear.

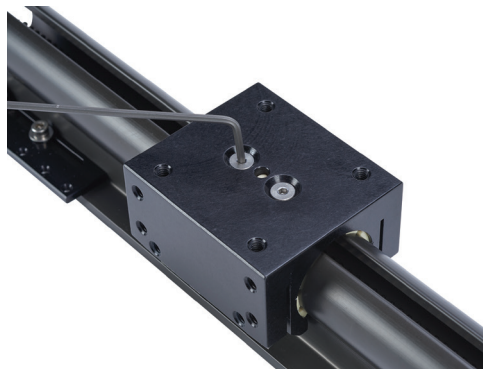
- 18) Using a 2mm hex key, select a side mount pre-load fastener and tighten it until contact is made, then add an additional 1/16 of a turn more. Move on to the next pre-load fastener and repeat. This adjustment makes conforming contact with the entire slide of the slide tube. Anything more than slight contact is unnecessary and counterproductive unless you are seeking high rigidity. Over-tightening is not recommended.

- 19) Vigorously move the carriage on the slide tube to seat the bearing again.

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- 20) Apply Loctite 425 to the threaded holes of the lead screw nut. Be careful that no threadlocker is on the surface of the nut or any sliding surfaces.
- 21) Apply Loctite 425 to the two flathead screws and attach the carriage to the lead screw nut with a 5/64-in hex key. Recommended torque is 6 in•lb. Tighten screws alternately and incrementally to ensure they are tightened evenly.

- 24) Use a lubrication pen to apply a liberal amount of lubricant to the slide tube. Apply lubricant to all outside surfaces of the slide tube. Apply a liberal amount of lubricant directly onto the lead screw. Move the carriage through the full travel to ensure an even coating of lubricant. Wipe away any excess lubrication.



- 22) Use finger force to tighten the lock nuts onto the lead screw. Move the carriage to test for ease of motion and re-adjust to eliminate any clearance. Introduce only a slight pre-load. Make certain the bearings are seated properly against the shoulders. If a lock nut is over-tightened it will reduce the efficiency and can cause premature bearing failure. When tightened to satisfaction, tighten the set screw to a snug fit.
- 23) When mounting the motor, orient the assembly vertically with the motor on top. Install motor/ coupling onto the actuator and tighten motor mounting screws. Next, tighten the coupler onto the lead screw using a 2.5 mm hex key.

