

## LAVLACC Linear Actuator Assembly Repair Kit Instructions For SureMotion® LAVL2 Series Value-Slide Linear Actuator Assemblies

### REPAIR KITS COVERED BY THESE INSTRUCTIONS

Repair Kit Product Compatibility	
Repair Kit #	Linear Actuator Assembly #
LAVLACC-006	LAVL2-60TxxLP2 (0.2-in lead screw pitch)
LAVLACC-007	LAVL2-60TxxLP5 (0.5-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

- 1 ea Lead Screw Nut and Mount Subassembly
- 4 ea Slide Liner
- 1 ea Ball Bearing
- 2 ea Flanged Ball Bearing
- 1 ea Retaining Ring
- 1 ea Lubrication Pen



### TOOLS

#### REQUIRED TOOLS

- Allen wrenches - 1.5 mm, 3/32"
- Allen wrench 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)
- Internal retaining ring pliers with a tip size of 0.028" or less
- Cleaning towels
- Safety glasses

#### OPTIONAL TOOLS

- 12mm open end 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

Disassembly assumes that a motor is attached to the motor mount and coupler.

- 1) Loosen the clamping screw on the lead screw side of the shaft coupler. If the shaft coupler is the standard beam coupler, use a 2.5mm hex key on the clamping screws.



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- 2) Remove the motor mounting screws, then remove the motor and shaft coupler.



- 3) Use a 1.5mm hex key to loosen the set screw on the lead screw shaft's lock nut, but keep the set screw threaded in the nut.

**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) Hold the carriage steady with one hand and use your other hand to loosen and remove the lock nut from the lead screw shaft.

**Tip:** If lock nut cannot be removed by finger, use a 12mm wrench or pliers to loosen the lock nut.



- 5) Use a 3/32-in hex key to remove the idler end mount screws. Pull the mount off the end of the lead screw.



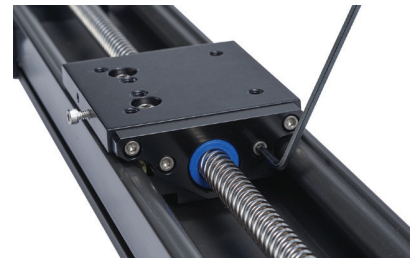
- 6) Push the lead screw out of the motor mount.

- 7) Thread the lead screw out of the lead screw nut on the carriage and set aside.

- 8) Remove and discard the flanged bearings on the motor mount.

- 9) Slide the carriage out of the base. Keep track of which side of the carriage originally faced the motor. Remove and discard the four slide liners.

- 10) Use a 3/32-in hex key to remove the screws attaching the lead screw nut to the carriage. Discard the lead screw nut but keep the screws.



- 11) Use retaining ring pliers to remove the retaining ring in the idler and mount. Remove and discard the bearing and the retaining ring.



- 12) Clean the lead screw and all surfaces of the carriage and base.

**COMPONENT REPLACEMENT / ACTUATOR ASSEMBLY**

- 13) Spin the new lead screw nut on the lead screw. Make sure that the lead screw nut's flange faces the motor end of the lead screw. Thread the nut onto the screw starting from the drive end. Apply lubricant the full length of the lead screw checking for tightness. Clean any debris that may cause tightness. Remove lead screw nut.

- 14) Replace the flanged bearings on both sides of the motor mount.

- 15) Replace the bearing and retaining ring in the idler end mount.

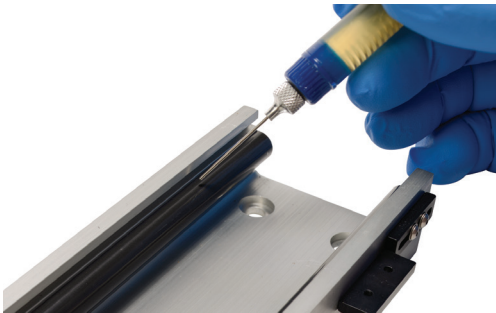
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- 16) Replace all four slide liners.



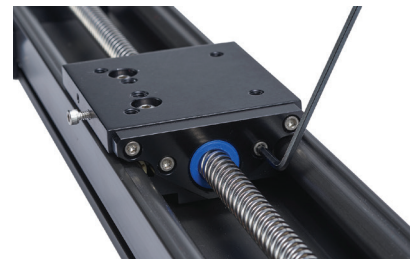
Make sure the raised ring on the OD of each liner is constrained in its groove on the carriage. Also make sure the raised cylindrical nub at the middle of each liner is seated in its circular pocket located at the seam between the top and bottom carriage sections.

- 17) Loosely assemble the new lead screw nut onto the carriage using the original mounting screws.  
18) Apply a small amount of lubricant to the base rails.



- 19) Slide the carriage back onto the base rails. Make sure the original motor side of the carriage faces the motor side of the base. If the carriage doesn't initially fit back onto the rails, try loosening the pre-load screws slightly with a 3/32-in hex key.  
20) Tighten the pre-load screws until slight resistance is detected, then tighten about a quarter turn further. The carriage should be able to be pushed with light effort, so loosen the screws slightly if the carriage requires noticeable effort to move.  
21) Slide the carriage back and forth several times. Periodically stop and rotate the carriage in all directions. This will help seat the new liners in the carriage, and may cause slight play to develop between the liners and rails. If slight play is detected, tighten the pre-load screws a bit more to eliminate the play without significantly increasing friction.  
22) Repeat step 21 until no further play develops. The carriage should not have any looseness, but should still be able to be pushed with light effort.

- 23) Position the carriage close to the drive end. Feed the lead screw, drive end first, through the lead nut and then through the bearings in the motor mount.  
24) Install the reassembled idler end mount on the lead screw. Mounting bolts should be loosely installed.  
25) Thread the lock nut back onto the drive end of the lead screw. Hand tighten until the two flanged bearings have limited axial play, but not to the point that it increases rolling friction. Tighten the set screw with a 1.5 mm wrench.  
**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.  
26) Move the carriage to the center of the system and loosely fasten the new lead screw nut to the carriage with the original lead screw nut mounting screws.



- 27) Move the carriage to the motor end by rotating the drive screw with your fingers, then tighten the two upper lead nut screws with a 3/32-in hex key.  
28) Move the carriage back a bit and tighten the two lower lead nut mount screws.  
29) Move the carriage to the idler end by rotating the drive screw with your fingers, then tighten the idler end mount screws with a 3/32-in hex key.  
30) Move the carriage back and forth along the full length of the base at least once to check for consistent movement characteristics. Apply some of the lubricant to the drive screw and slide the carriage to distribute it along the entire travel length.  
31) If carriage movement feels tighter towards one end of the system, the mount, there may not be adequately aligned with the nut. Loosen the mounting screws on that end and repeat the appropriate procedures outlined in steps 27 through 29 as needed.  
32) 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.