

# LECTROTAB

MARINE LINEAR ACTUATOR

## “Hatch Lift”, Operation, and Installation Manual



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## Introduction

Lectrotab designs and manufactures premium quality electromechanical trim tab systems, Battery Charges, Linear Actuators and Hatch Lifts for the leisure and commercial marine markets. All Lectrotab systems are easy to install on new boats or to replace existing systems.

The Lectrotab, Hatch Lift design advantages include:

- A non-hydraulic, electromechanical design which is maintenance free and requires no hydraulic oil.
- Stainless steel, Telescoping ram, with Epoxy Coated or Anodized outer aluminum housing for strength and durability.
- An internal actuator braking design that maintains actuator position for partially or fully extended actuators.
- A “free spinning” ball screw allows the actuator to reach full deployment or retraction without the need for limit switches.
- Pivoting upper and lower brackets for maximum installation flexibility.
- Ram seals and internal sleeve add resistance from the elements and stability while deploying.
- The actuator can push up to 400 lbs. of force.
- A precision planetary gear box for quiet and efficient operation.
- Optional Emergency release bracket provides 4” clearance to access the pull pin, should there be a power outage.
- Compact, rocker switch for push button, up and down positioning.

## Safety

- Failure to follow all instructions listed in this manual may result in equipment failure or serious injury.
- Never open a heavy hatch/engine cover while underway. Jolting can cause the mounts to fail, allowing the covers to drop.
- Never operate a lift without the pull pin fully engaged with the bracket.
- Stay alert, watch what you are doing, and use common sense when moving large or heavy hatches, windows or vent covers.
- Keep your arms and legs away from heavy covers while lowering. Moving parts can create “pinch points” pay attention and keep fingers away from slides or hinges while the actuator is moving.

## Marine Linear Actuators

“Marine Linear Actuators” are used to automate large covers, open and close windows, or hatch lids. They can also be used to adjust ventilation dampers, open and close doors or sliding storage panels. The extended length actuators can raise or lower seating, table tops or position coolers under a seat for space. The Lectrotab, Hatch Lifters, are designed for new installations as well as retrofit of existing actuators. They are simple to install and operate with just the push of a button. Standard actuators are non-submersible, for submersible units, contact Linear Devices Corp.

- **Hatches and Engine Covers**

Large hatches or engine covers can be difficult to move without help. The Lectrotab hatch lifts can handle most covers up to 400 lbs. of force. “Force” is not the same as “weight”. On a hinged cover, the weight transfers to the hinge as the cover opens or pivots on the hinge. When a hatch lift is used, the closer the upper mount is to the hinge, this weight turns into force that is applied to the actuator. For this reason, we provide a force calculator to estimate the amount of weight that’s being applied to the actuator. This will help with proper placement of the lift to the hatch cover, so the force doesn’t exceed the 400 lb. rating.

- **Doors and Panels**

The Hatch Lift can be mounted horizontally, to move doors or track mounted panels. Storage compartments with hinged doors or those that slide on tracks or rails can be automated with an extended length actuator.

- **Ventilation dampers and fresh air vents**

Full automation of ventilation and fresh air vents for your boat can be done with one of our Lectrotab Hatch Lifts. Control switches can be installed at the helm where you can control and see the vent move. The internal breaking design can hold most vents in place, while underway.

- **Lounging Automation**

Seating, lounge chairs and tabletops can all be automated with a Lectrotab Hatch Lift. Seat backs can be adjusted for a more comfortable ride. Lounges can be adjusted from horizontal to upright position. Tabletops can adjust to a higher position or possibly drop to the same level as the seats to form a larger lounge or day bed.

- **“Out of the way”**

Automation can also be extremely helpful and convenient when space is limited. Coolers or other larger items can become a nuisance in the open space, at the back of the boat. Installing rails and a Marine Linear Actuator can retract a cooler under a seat or cabinet, “out of the way”. The push of a button and the cooler will deploy from its storage for use. This same approach can be used for a variety of components normally resting in the open space of the boat.

## Hatch Lift Installation:

### Reviewing the Installation:

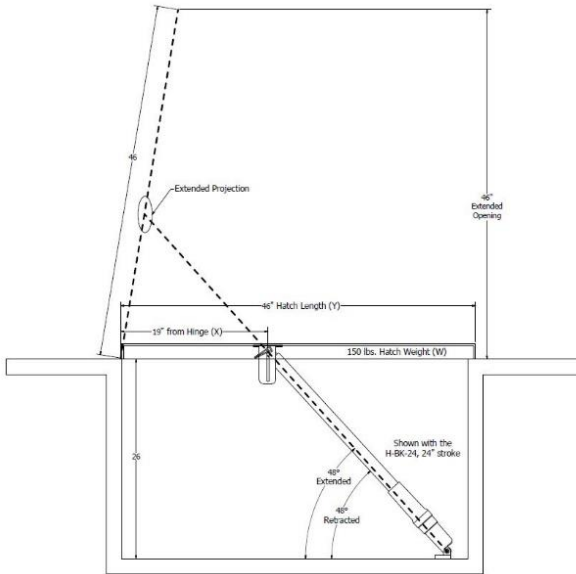
Most hatch lift applications approach a hard stop when fully retracted (closed). “Hard stop”, is when the moving object contacts a non-moving object. Some applications will have hard stops at both deployment (opening) and retraction. Review your application and how the actuator will be installed to make sure the actuator reaches “free spin” before any hard stops.

### Required Tools:

Measuring tape, marker, screwdriver, drill, mounting holes sized for #14 screws, or ¼” thru bolts. .1875” (5mm) drill bit for #14 screw, .266” for ¼” bolt. Fasteners not included with kit.

### Mounting the Lift: Vertical, Hatch lift

1. If the lift is not a perfect fit, there are several ways to adjust placement, so the retracted length pulls the hatch closed without binding.
2. Make the upper mount connection first, per the measurements determined by the selection guide. This will keep the calculated force on the actuator the same.
3. With the hatch closed, swing the lower mount so it rests on a flat surface.
4. If the hatch has a seal or rubber gasket, allow the gasket to rest snugly against the stationary surface when mounting the lower bracket.
5. If the hatch does not have a seal, consider installing one, or place a temporary shim at the edge, opposite the hinge, to slightly space the hatch off the stationary surface.
6. This will allow the actuator to free spin before the hatch makes a hard stop.
7. If the lower mount does not reach a mounting surface, a shim or brace may be added to provide a secure, lower mount.
8. NOTE: The lower mount should rest on a stringer or bracket, not on the inner hull as the mounting screws may penetrate the hull.
9. At this point, the lift can be powered for testing, without mounting the switch.
10. Deploy the lift to its fully open position (actuator free spins) while carefully looking for any binding or clearance issues.
11. Once open, drop the powder and allow the hatch to remain open for further inspection.
12. Check your open space dimension and compare it with that noted during the selection process.
13. If no issues are found, reverse polarity to the wiring and allow the actuator to retract, again carefully looking for any binding or clearance issues.
14. As the hatch approaches a closed position, (remove shim if applicable) pay close attention to the contact between the moving surfaces and the fixed surface.
15. Select the location for the switch (within 6’) and follow the installation and wiring information, found on page 9 & 10. Contact Lectrotab for optional longer cable lengths if needed.
16. Refer to **Fig. 1** for an illustration of a vertical installation.



**Fig. 1**

**Fig. 1**, shows the vertical installation, where the hatch lift was angled forward. The angle should not be less than 45 deg. when mounted. If the upper mounting location needs to move, the force calculation should be done again to confirm the force is below 400 lbs. Moving closer to the hinge will increase the force, farther away from the hinge will decrease the force. The extended opening will also increase the closer to the hinge or decrease the farther away as well.

**Fig. 1** also shows the information needed to calculate the force on the hatch.

$$(Y \times W)/X = \text{force.}$$

Y = hatch length (46")

W = hatch weight (150 lbs.)

X = mount location (19")

$$(46 \times 150)/19 = \mathbf{363\text{lbs.}} \text{ of force}$$

(If dual lifts are needed, contact Lectrotab)

## Hatch Lift Installation: Horizontal

### Reviewing the Installation:

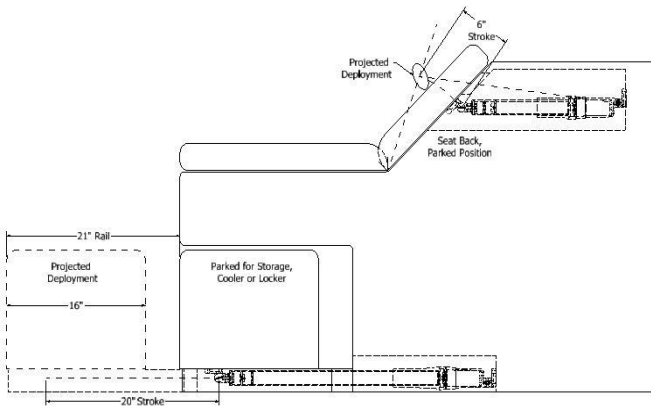
The horizontal installations may be different than the vertical, as there's not as much weight transferring through the hinge, creating force on the actuator. The horizontal installation will focus more on the stroke length and how it relates to the object's being moved.

### Required Tools:

The same as used for the vertical installation.

### Mounting the Actuator:

1. The stroke length of the actuator should closely match the amount of travel associated with the component being moved.
2. If the component is mounted on rails, you will measure the distance from its parked position to its extended position.
3. The actuator must reach "free spin" before the component has a hard stop at its extended or retracted positions.
4. When selecting the mounting position of the actuator, use the parked position of the component and a fully retracted actuator.
5. If a rubber bumper is used to dampen vibration, allow the actuator to pull the component snugly against the bumper but not too tight.
6. The stroke of the actuator should be slightly less than the "Dead Stop" travel length of the rails or slides. Ex. 20" stroke to 21" rails. **See Fig. 2.**
7. This allows the actuator to reach full stroke and "free spin" before the assembly reaches a hard stop at the end of the rail.
8. The rails need to extend far enough to allow the component to clear its parked position for use.



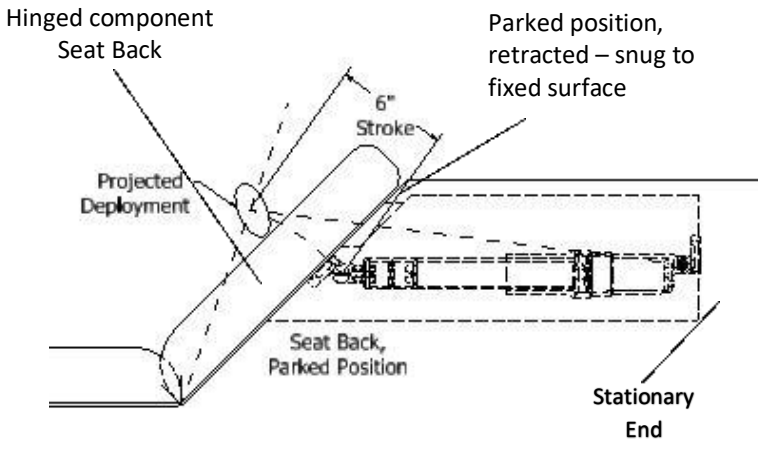
**Fig. 2**

## Seat Back Installation: Horizontal

**Fig. 2**, also shows a hinged, adjustable seat back. The hinged, horizontal mounting will be like the vertical hatch lift, as it will have one hard stop on retraction only.

### Mounting the Actuator:

- . The stroke length of the actuator should match the amount of travel required.
- . Locate where the actuator will mount on the parked hinged component. Make a small mark on the moving and stationary surfaces.
- . Adjust the component to the desired, fully open/deployed position and measure the distance between the marks.
- . Find the actuator that closely matches this distance, it will most likely not be exact, so you will need to go with either a slightly longer or shorter stroke.
- . When selecting the exact mounting position of the actuator, use the parked position of the component and a fully retracted actuator. **See Fig. 3**
- . If possible, mount to the hinged component first, then adjust it to its parked position. Mark the stationary actuator mount by adjusting the hinged component so the seal is snug against the fixed surface.
- . Or: mount the stationary end first, adjust and mark the deployed end so it pulls the hinged component snugly to the fixed surface.
- . The deployed stroke of the actuator will determine the full deployment of the hinged component. The retracted stroke should be slightly less than the "Dead Stop" or parked position, so not to bind or cause damage to the component or actuator.



**Fig. 3**



## Actuator Wiring

### SF-HL:

#### Reviewing the Installation:

The Hatch Lift Actuator's come standard with a 6' (1.8m) cable for a home run connection to the SF-HL rocker switch. This allows the operator to have a full view of the lift while operating and it can be paused or reversed if necessary. The SF-HL is not "waterproof", but "water resistant", do not install in areas exposed to direct rain or wash down. Place under an overhang or covered space. The switch comes with mounting hardware, bezel and 8" (203 mm) wiring pig tail.

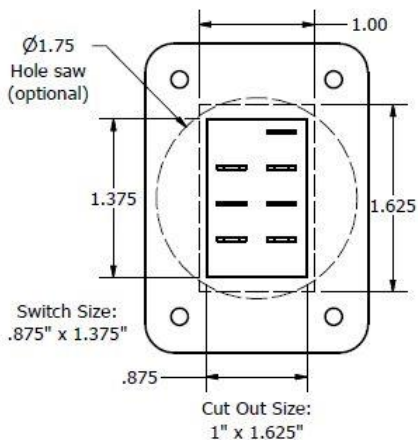
If other options are needed regarding longer cables or a waterproof switch, contact Lectrotab for recommendations.

#### Required Tools:

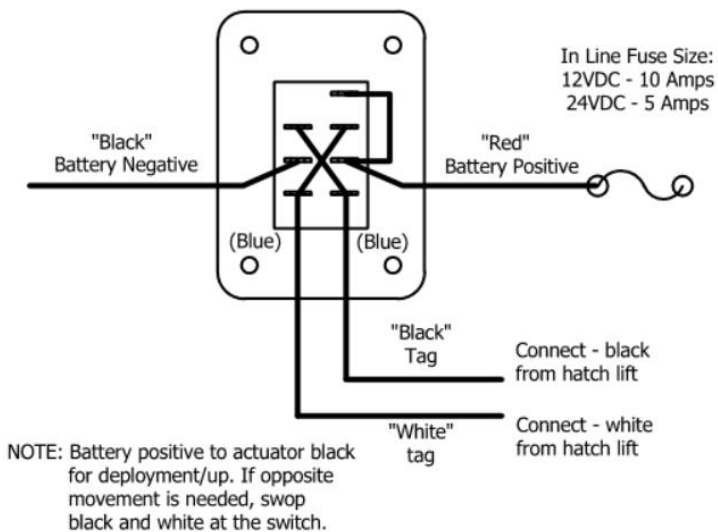
Measuring tape, marker, screwdriver, drill, 1.75" hole saw, or jigsaw for rectangular cut out. Drill bit for #6 (M3.5) screw #36 or #32. Additional wiring from DC positive and negative not included with kit.

#### Mounting the SF-HL Rocker:

1. Locate a dry mounting space within 6' (1.8m) of the mounted actuator. Stretch or route the cable to the mounting location to confirm connection can be made and cable can be routed cleanly and secured. Contact Lectrotab for longer cable length options.
2. Cable wiring can be spliced, just use proper connectors for the wire size (actuator 18 ga.) with heat shrink insulators over the terminals.
3. The "vent tube" routes down the full length of the cable with the black and white wires. Leave the end of this tube exposed to the atmosphere. The opening cannot be exposed to water, keep it high and dry.
4. Refer to **(Fig. 4)**, for cut out dimensions for the SF-HL switch. There are two options: round or rectangular, either will work.
5. Once the cut out is made, you can set the switch in place and mark the (4) #6 holes or measure them per dimension, mark and pre-drill.
6. Route the DC positive and negative from the fuse panel or buss bar to the switch mounting location. Leave a little excess for service loop.
7. **Important:** DC voltage source connected to the SF-HL must match actuator voltage. (H = 12VDC, HB = 24VDC)
8. Refer to the wiring diagram **(Fig. 5)** for the fuse size and connections to the SF-HL.
9. If possible, hook up the wiring to the switch to test, run the actuator up and down to confirm all connections are made and there's no loose terminals.
10. Permanent wire connections can be made with the switch mounted or by pulling the wires through the cut out and connecting them to the Pig tail before mounting the switch.
11. Once installation is complete, test the actuator again to confirm connections and operation both up and down.



**Fig. 4**



**FIG. 5**

## Troubleshooting

Problem	Cause	Solution/ Test
<b>1</b> Control switch and actuator does not move	<b>(a)</b> The +12vdc or +24vdc and/ or negative (-) power source to control has an open fuse, open breaker or open wire connection	Connect a DC Voltmeter positive lead to +12/24vdc terminal and the negative lead and meter should show +12 or 24vdc (see wiring diagram Fig 5). If not, check fuse, breaker and wiring. There's no source coming to the switch.
	<b>(b)</b> Power and ground are found at the switch, but actuator is not moving	Check connection/splice of the wires going to the actuator. Measure voltage coming out of the switch to the actuator connections. If power is coming from the switch, unplug the actuator and put power and ground to the black and white actuator wires. If the actuator does not move, the actuator is bad.
	<b>(c)</b> Power and ground are found at the switch, but the actuator is not moving	Measure voltage coming out of the switch to the actuator connections. If no reading is found, check incoming power to the switch. If power is found there, unplug the actuator and apply power and ground, directly to the black and white actuator wires. If actuator works, the switch is bad.
<b>2</b> The actuator is struggling to get the hatch up	Power and ground are found at the switch, but the hatch shakes slowly as it tries to move	Measure voltage coming out of the switch, to the actuator. If reading 11.5 or greater, voltage should be good. Check the hatch weight and location of the upper mount on the cover, run the calculation again to confirm the weight is at or below 400 lbs. If above 400 lbs. move the upper mount farther away from the hinge, the force/hatch weight is too high.

Problem	Cause	Solution/ Test
<p>3 Actuator binds or breaks at the hinge points</p>	<p>Check the mounting alignment at the upper and lower connections. If there's binding it can break the mounts</p>	<p>Check both the upper and lower mounts and how the actuator rests inside the forks of the brackets. Open the hatch about halfway, block it to relieve some of the weight. Shake the actuator body to see if it has some movement or if it's tight in the mounting forks. If the actuator is tight, adjustment of the mounting is needed. Pivot points should align with the hinge of the hatch (parallel) and the upper and lower on the actuator must be on the same plane. Loosen two of the screws on one mount at a time, to see if it shifts. If so, mark and redrill the holes.</p>
	<p>The actuator could be making a hard stop before going into free spin. If it happens only when closing of the hatch, it's pulling down too tight and breaking the plastic</p>	<p>Observe the actuator and hatch as it pulls closed. If any stress or contact is visible, the actuator will need adjustment. Remove the screws from one of the mounts, place a small shim under the hatch cover (one on each side or one on the centerline) to slightly space the hatch over the fixed surface. Mark and drill the new holes and apply the screws. Check again to see that the stress or contact is gone.</p>



## WARRANTY POLICY

- Lectrotab Hatch Lift actuators and Rocker Switches are covered by the warranty period listed below. The Lectrotab warranty covers material and workmanship defects when installed together as a Lectrotab system.
- The warranty period ends when the actuator becomes unusable for reasons other than material and workmanship defects.
- Review and complete warranty information, located on the Lectrotab website at [www.lectrotab.com](http://www.lectrotab.com).
- Actuator failures due to normal wear and tear, excessive force, exposure to environment, misuse, abuse, neglect, negligence, incidental or consequential damages or a failure to follow Lectrotab’s written installation instructions are NOT covered by this warranty policy.
- This warranty policy does NOT cover labor costs, hauling fees or any other associated fees pertaining to replacing the actuators or actuators installed in a non-Lectrotab trim tab system.

To determine if a Lectrotab part is covered under warranty, please see the “Warranty Period” listed below. All Lectrotab parts have a serial number date code used to determine if the part is still within the warranty period. The actuator serial number is located on the right side of the upper cover. An example for actuators would be “HK24” (K represents the month of October in alphabetical order (skip letter I) and 24 is year 2024). The SF-HL control serial number shows the week and the year “1224” (12 is the 12<sup>th</sup> week and 24 is year 2024).

Lectrotab Part	Warranty Period
Hatch Lifts, Linear Marine Actuators	2-year warranty for single actuator an a complete Lectrotab system from date manufactured. (Complete system must include Lectrotab control and actuator.)
Control Switch	2 years from date manufactured

NOTE: Standard Hatch Lifts are spray proof, “non-submersible”.

If submersible units are needed, contact Linear Devices Corp for details.



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