



ELECTROMECHANICAL TRIM TAB SYSTEM

Operation and Installation Manual



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Introduction

Lectrotab designs and manufactures premium quality electromechanical trim tab systems for the leisure and commercial marine markets. The Lectrotab system is easy to install on new boats or to replace existing trim tabs.

The Lectrotab design advantages include:

- A non-hydraulic, electromechanical design which is maintenance free and requires no hydraulic oil.
- 12 gauge stainless steel with an integrally formed 12 gauge rolled and pinned hinge to strengthen the tab and eliminate spot welds.
- An internal actuator braking design that maintains tab position in rough conditions and when backing down.
- Choice of convenient helm mounted control switches which provide instant actuator start and stop for very accurate tab positioning.
- A full pivoting upper bracket for maximum installation flexibility.
- A patented ram seal which cannot be fouled by barnacle growth and a patented internal pressurization system for added watertight integrity.
- A complete non-metallic, double insulated, actuator which cannot corrode and will not deteriorate in the sun or under water.
- A precision planetary gear box for quiet and efficient operation.

Safety

- Failure to follow all instructions listed in this manual may result in equipment failure or serious injury.
- If using trim tabs for the first time, follow the Operation section of this manual to familiarize yourself with the feel and response of your trim tab system.
- Never deploy tabs in a following sea. Keep tabs fully retracted in a following sea.
- Never deploy tabs quickly at high speeds or above cruising speeds. This may cause the boat to turn quickly and become unstable and difficult to control.
- Stay alert, watch what you are doing, and use common sense when operating your trim tab system.
- Do not use the trim tab system when under the influence of drugs, alcohol or medication. A moment of inattention while operating the trim tab system may result in serious injury.

How Do Trim Tabs Work

Boaters will enjoy many performance and efficiency benefits by adding Lectrotab trim tabs. Lectrotab trim tabs improve fuel efficiency, increase boat speed, accelerate shallow water planing, eliminate porpoising, and enhance the overall boating experience with a more comfortable ride.

- **Improved Fuel Efficiency and Faster Speeds**

Most importantly, the trim tabs may be adjusted to optimize speed and fuel efficiency. Typically, the bow rides high causing the stern to drag in the water at cruising or lower speeds. A boat owner will attempt to correct this problem by trimming the outdrive down to bring the bow down. This adjustment is extremely inefficient and reduces boat speed and increases fuel consumption, because trimming of the outdrive pushes water down to allow the transform to rise and bow to lower. In this scenario, the outdrive is not only propelling the boat forward, but it is also pushing the bow down. The most efficient way to operate the boat is to adjust the tabs to maximize boat speed and level. The outdrive may then be adjusted so the prop shift is parallel to the water to maximize the thrust to push the boat forward.

- **Faster Planing**

For shallow water starts, trim tabs allow the boat to get up on plane faster. Faster planing can be accomplished by lowering the tabs to the fully deployed position. As the boat achieves plane, trim tabs may be raised until the boat is level.

- **Porpoising**

Occasionally, an uneven load distribution or certain speeds will cause the boat to “porpoise”. This problem can easily be corrected by deploying both trim tabs simultaneously a few degrees until the “porpoising” stops.

- **Head Sea**

Rough sea conditions can also be better managed with trim tabs. Typically, in a head sea, the boat speed must be reduced causing the bow to ride high. The waves will pound the boat bottom for an extremely uncomfortable and slow ride. Trim tabs can be deployed to level the boat out and allow the hull to cut through the waves for a smoother and more efficient ride.

- **A Beam Sea or Wind**

A beam sea or wind can lead to a wet ride. To greatly reduce or eliminate the spray caused by waves or wind hitting the boat side, the windward side trim tab may be deployed to raise the windward side of the boat. Also retracting the leeward trim tab side may help.

Tab Plate Installation

Review Installation:

Review the tab plate and actuator installation diagrams in Fig 1 and 2 to ensure there are no interference issues with the tab plates or actuator on the boat transom before actual mounting begins. Place the actuator and tab plate against the transom before mounting to correct any interference problems before the mounting begins.

Required Tools:

Straight edge, screw driver, drill, 3/16" (5mm) drill bit, 3M 5200 Sealant, #14X1-1/4" (6X30mm) pan head stainless steel screws.

Mount Tab Plates:

1. Align the tab mounting plate to the transom as shown in Fig. 1. A tab mounted closer to the boat chine is more effective in correcting list; however, maintaining a 2" (5cm) or greater distance from the chine will reduce the risk of tab damage from docks or other obstructions. Keep the inward facing tab edge approximately 6" (15cm) or more away from the motor outdrive unit for motor clearance when fully turned.
2. Use a straight edge on the hull bottom to mount the tabs 1/4" (6mm) minimum distance from the hull bottom to the bottom of the tab plate
3. Mark the mounting plate holes on the transom. Use a 3/16" (5mm) drill bit to drill out the marked mounting plate holes.
4. Apply 3M 5200 sealant to fill the screw holes and coat on the back surface of the tab mounting plate.
5. Mount the tab plate to the boat transom. Wipe away excess sealant.
6. Repeat process for the starboard tab plate.

Port Side Transom Tab Plate

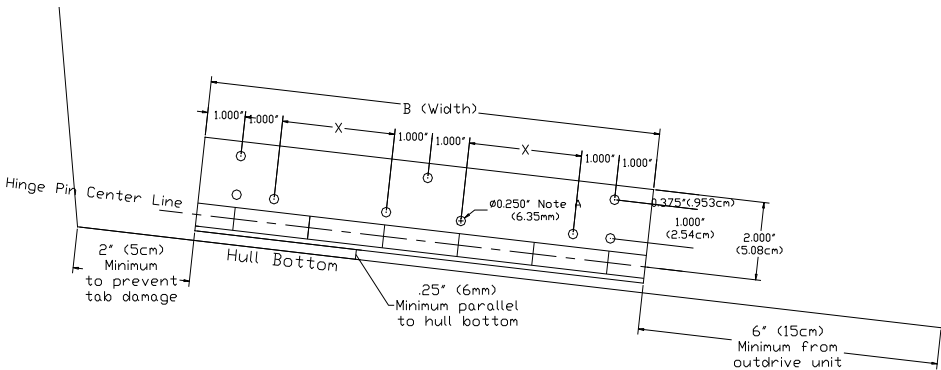


Fig. 1

Actuator Installation

Required Tools:

Straight edge, screw driver, drill, 3/16" (5mm) and 11/32" (9mm) drill bits, 7/16" (11mm) deep well socket and wrench, 3M 5200 Sealant, #14X1-1/4" (6X30mm) pan head stainless steel screws.

Mount Actuator:

1. Remove plastic bag containing 1/4" carriage bolts and nuts from the actuator rubber band.
2. Mount actuator lower bracket to trim tab plate using 1/4" carriage bolts and nuts. The actuator should be fully retracted.
3. For new installation, punch or drill out the 3 outermost holes in the actuator upper mounting bracket. For Bennett retrofits, punch out the innermost upper bracket mounting holes to match the existing Bennett hole pattern (see Fig. 3).
4. Place the actuator upper mounting bracket flat against the boat transom.
5. Place a straight edge against the hull bottom and raise the tab plate **trailing edge** approximately 1/2" (13mm) from the hull bottom. The tab plate was mounted 1/4" (6mm) from the hull bottom, so the tab trailing edge is raised an additional 1/4" (6mm) from this.
6. Mark the actuator upper bracket mounting holes on the transom. The upper mounting bracket may be removed from the actuator to be used as a template. DO NOT drill the upper bracket holes while still connected to the actuator. This may cut the wire cable. Use a 3/16" (5mm) drill bit to drill out the marked mounting bracket holes in the transom.
7. Use Fig. 3 as a diagram to drill out an 11/32" (9mm) hole for the actuator cable to pass through the transom. Another option would be to drill the same size hole at higher entry point on the transom and use a clamshell with sealant.
8. Route the actuator cable completely through the center hole in the upper bracket. Next, route the cable through the hole in the transom leaving a few inches of cable extending from the transom for step 9.
9. Apply 3M 5200 sealant to fill the screw holes, fill the cable hole and fill the cavity in the rear of the upper mounting bracket where the cable extends through.
10. Push the remaining cable through the transom and mount the actuator upper bracket to the transom with #14X1-1/4" (6X30mm) screws. Wipe away excess sealant.
11. Tighten the upper bracket 1/4" bolt snug (**Do Not Over-tighten** since the actuator must move freely in the bracket).

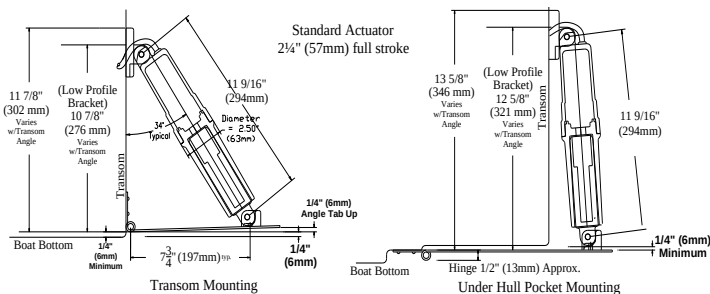


Fig. 2

BACK VIEW OF UPPER BRACKET

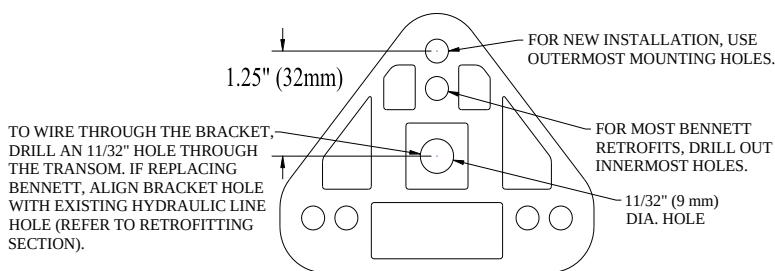


Fig. 3

Actuator Wiring

KA Kits:

1. KA Kits include actuators with 6' (1.8m) extended cable and 20' (6.1) cable (W4-20) to attach from the actuators to the control switch (see Fig. 4). This cable is also available in longer lengths. Visit www.lectrotab.com for additional cable lengths listed under Products/Individual Parts and Accessories.
2. KA Kits include a hardware kit, which contains a terminal strip and terminals to connect the actuator cable to the 20' (6.1m) cable may be routed starting where the control switch will be mounted. The 4 blue push-on terminals will connect to the rocker switch.
3. Mount the 4 lug terminal strip provided in a **high and dry location** well above bilge water and protected from water above and within reach of each actuator cable.
4. Within each actuator cable is a vent tube that must be connected to a **high and dry location** with the tube facing downward to prevent water from entering. The vent tube maintains a positive pressure inside the actuator.
5. Crimp the fork terminals to the cut end of the black actuator cable and connect to the 4-lug terminal strip per Fig. 4.
6. Crimp the fork terminals to the cut end of the 4-conductor gray cable (W4-20) and attach to the 4-lug terminal strip per Fig. 4.

XKA Kits

1. XKA Kits include actuators with 23' (7m) of cable extended from the actuator. This cable will be routed directly to the control switch without a connection point at the transom. Visit www.lectrotab.com for a complete list of trim tab kit contents.

Flat Rocker Switch Wiring

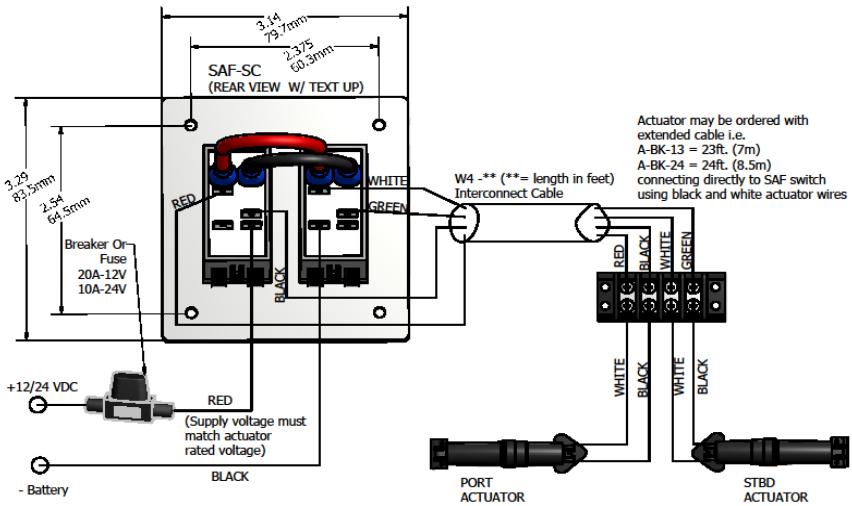


Fig. 4

Flat Rocker Switch Installation

1. The SAF-SC is a flat rocker switch, and the SAB-S has an extended lever type switch handle. Both switches are for single station applications. For dual station applications, a SAF-NSC or SAB-NS must be used. For detailed control switch specifications, visit www.lectrotab.com under Products or Technical Library/ Technical Manuals or Wiring Diagrams.
2. If the W4-** cable is used to connect the switch to actuators, route the cut cable end from the Rocker Switch to the transom terminal strip. The push-on terminal end of the 20' (6.1 m) 4-conductor, 14 AWG (2.08 mm squ.) cable connects to the Rocker Switch (KA Kits), or route the longer 23' (7m) actuator cable directly to the Rocker Switch (XKA Kits). Connect cable to switch as shown in Fig. 4.
3. Connect a fused 12vdc power source as shown in Fig 4. **Power source voltage must match the actuator voltage.**
4. The cutout dimension to mount the Rocker Switch is 2.25" (5.7 cm) X 2" (5.1cm). The switch panel is mounted with four #4 flat head screws provided.

Control (SLC) "One Touch" Switch Wiring

"SLC-11" Control Installation/Wiring Diagram

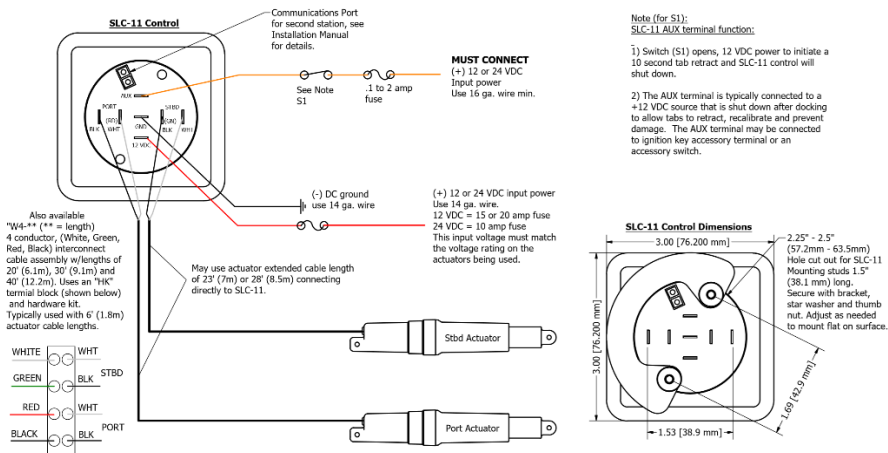


Fig. 5

Control (SLC) Switch Installation

1. The SLC Control Switch has LED indicators to show tab angle. For dual station applications, an SR cable for each control switch must be used. For dual actuators, per tab applications or programming information, visit www.lectrotab.com under Products or Technical Library/Technical Manuals or Wiring Diagrams.
2. If the W4-** cable is used to connect the switch to actuators, route the cut cable end from the control switch to the transom terminal strip. The push-on terminal end of the 20' (6.1m), 4-conductor, 14 AWG (2.08mm sq.) cable connects to the control switch (KA Kits), or route the longer 23' (7m) actuator cable directly to the control switch (XKA Kits). Connect cable to switch as shown in Fig. 5.
3. Connect a fused 12vdc or 24vdc power source as shown in Fig. 5. **Power source voltage must match the actuator voltage.** The **AUX** terminal on the control **MUST** be connected to a switched +12 or 24vdc source such as an ignition key switch or auxiliary panel switch. When the key switch is turned off, the tabs automatically retract.
4. The cutout dimension to mount the control switch is 2.25" (57mm) to 2.5" (63mm) diameter. The switch panel is mounted with bracket and nuts provided. Tighten nuts to mounting studs (**DO NOT OVERTIGHTEN**).

Operation

1. Begin with the tabs fully retracted by pressing the two "BOW UP", bottom switch buttons, or "ALL UP" button until the LEDs are flashing on the control switch (or after 8 seconds for the flat rocker switch control).
2. Bring the boat to a comfortable cruising speed.

Trimming the Port Side:

1. Press the upper left "PORT BOW DOWN" button until you feel the boat's port side begin to lower, then release the upper left "PORT BOW DOWN" button. The control switch will light LEDs on the right side of the control to indicate that the starboard tab is being deployed to raise the starboard transom, causing the port bow or side to lower. If it is preferred to switch the LED indicator to the opposite side indicating the bow is going down, then please review the control switch program chart at www.lectrotab.com under Products/ Controls.
2. Press the bottom left "PORT BOW UP" button until you feel the boat's port side begin to rise, then release the lower left "PORT BOW UP" button.

Trimming the Starboard Side:

1. Press the upper right "STBD BOW DOWN" button until you feel the boat's starboard side begin to lower, then release the upper right "STBD BOW DOWN" button. The control switch will light LEDs on the left side of the control to indicate that the port tab is being deployed to raise the port transom or side, causing the starboard bow or side to lower.
2. Press the bottom right "STBD BOW UP" button until you feel the boat's starboard side begin to rise, then release the bottom right "STBD BOW UP" button.

Adjusting Bow Down or UP:

1. Press the lower right "STBD BOW UP" and lower left "PORT BOW UP" buttons at the same time for 8 seconds or momentarily press "ALL UP" button until the top two LEDs are flashing, indicating the tabs are fully retracted. Press the upper right "STBD BOW DOWN" and upper left "PORT BOW DOWN" buttons at the same time, and the bow should begin to lower. Keep these buttons pressed until the boat achieves the proper level and then release the buttons. Press both BOW UP buttons or "ALL UP" button to bring the bow back up if necessary.
2. For a faster hole shot or faster planning, momentarily press and release the "ALL DN" button to deploy both tabs fully. Once planning speed is reached, press the "ALL UP" button to retract the tabs and momentarily press and release the "ALL UP" button again once the boat is level to stop tab retraction.

Troubleshooting

Problem	Cause	Solution/ Test
1 Control switch (SLC) LEDs do not light	(a) 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 (far left terminal) on LED control, and the negative lead to the center terminal and meter should show +12 or 24vdc (see wiring diagram Fog 5). If not, check fuse, breaker and wiring.
	(b) The +12vdc or 24vdc connected to AUX terminal is switched to off state (see Note in control wiring diagram).	A Switched (closed contact) +12vdc or 24vdc MUST BE CONNECTED TO AUX TERMINAL for control switch to energize LEDs and function. Connect a DC Voltmeter positive lead to AUX terminal (far right terminal) and the negative lead to the center terminal and meter should show +12 or 24vdc. If not, check fuse, breaker, aux switch and wiring for open connection. A jumper wire may also be connected between the +12/24vdc terminal (far left) and AUX terminal (far right) to test control for LED functioning. When jumper is connected, LEDs should light.
	(c) In a dual station system, the second station control LEDs do not light or function due to open 2 conductor communication cable or loss of 12/24vdc power to second station	Test second station control as in section 1(a) described above. Turn off power to both controls. Turn power on to both controls. Primary control should sense second station and test controls. Test to make sure 2 conductor cables and plugs connected to secondary and primary stations are good connections and the wire is not cut or open. If the second station still does not light, try test section 1(b) described above but remove SR cable first. If the jumper test in 1(b) does not light the control LEDs, then replace the control.
2 Actuator does not deploy or retract tab when Bow Down or Bow Up is pressed on control	Failed actuator, poor wiring connection or failed control	Connect +12vdc (Actuator serial number begins with A or C) or 24vdc (Actuator serial number begins with B or D) to BLACK actuator wire, and battery negative (-) to WHITE actuator wire (see wiring diagram Fig 5). This should deploy the actuator and tab. Reverse polarity to retract the actuator and tab. If the tab does not deploy or retract, replace the actuator. If actuator does deploy and retract, check wiring and repair any poor connections. If actuator still does not deploy or retract, replace control.

Problem	Cause	Solution/ Test
3 Control LEDs stay dim in sunlight	The LED control is equipped with a photo sensor to dim the LEDs in the shade or darkness or brighten the LEDs in sunlight for proper operation	Shine a flashlight directly into the photo sensor located at the top center of the control. If the LEDs brighten, the control is operating properly. If the LEDs do not brighten, replace the control.
4 Control LEDs stay bright during night	The control is equipped with a photo sensor to dim the LEDs in the shade or darkness or brighten the LEDs in sunlight for proper operation	Cover your finger completely over the photo sensor located at the top center of the control. If the LEDs dim, the control is operating properly. If the LEDs do not dim, replace the control.