



ELECTROMECHANICAL TRIM TAB SYSTEMS

# Operation and Installation Manual



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# Table of Contents

- Introduction/Safety.....3
- How Do Trim Tabs Work.....4
- Tab Plate Installation.....5
- Actuator Installation/Wiring.....6-7
- Rocker Switch Wiring.....8
- Oval LED Control Wiring.....9
- Operation.....10
- Troubleshooting.....11
- Warranty Information.....12

# 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. All Lectrotab actuators are covered by a worldwide lifetime warranty.

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 their 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 transom 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 shaft 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.

- **Boat Leveling**

Every boat owner has experienced passengers or equipment moved to one side of the boat, which causes the boat to lean to one side and leads to difficulty in handling the boat as well as an uncomfortable ride. Adding trim tabs to a boat corrects this problem by deploying the tab on the same side as the boat is leaning towards which levels the boat for a more comfortable ride.

- **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 and beat 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 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.

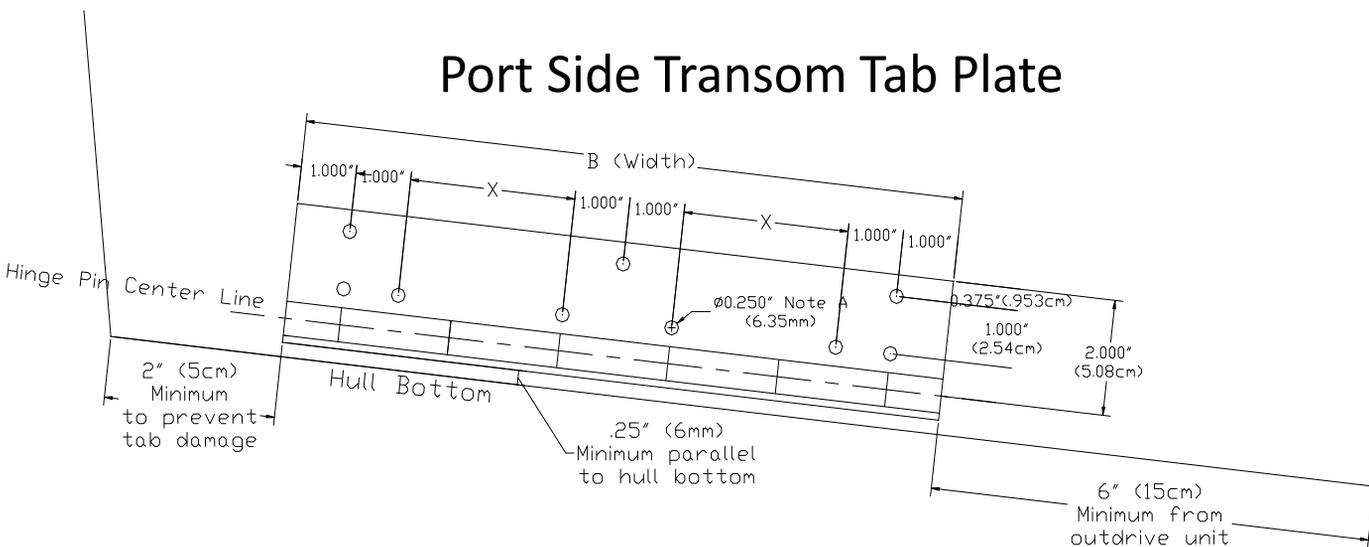


Fig. 1

# 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 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).

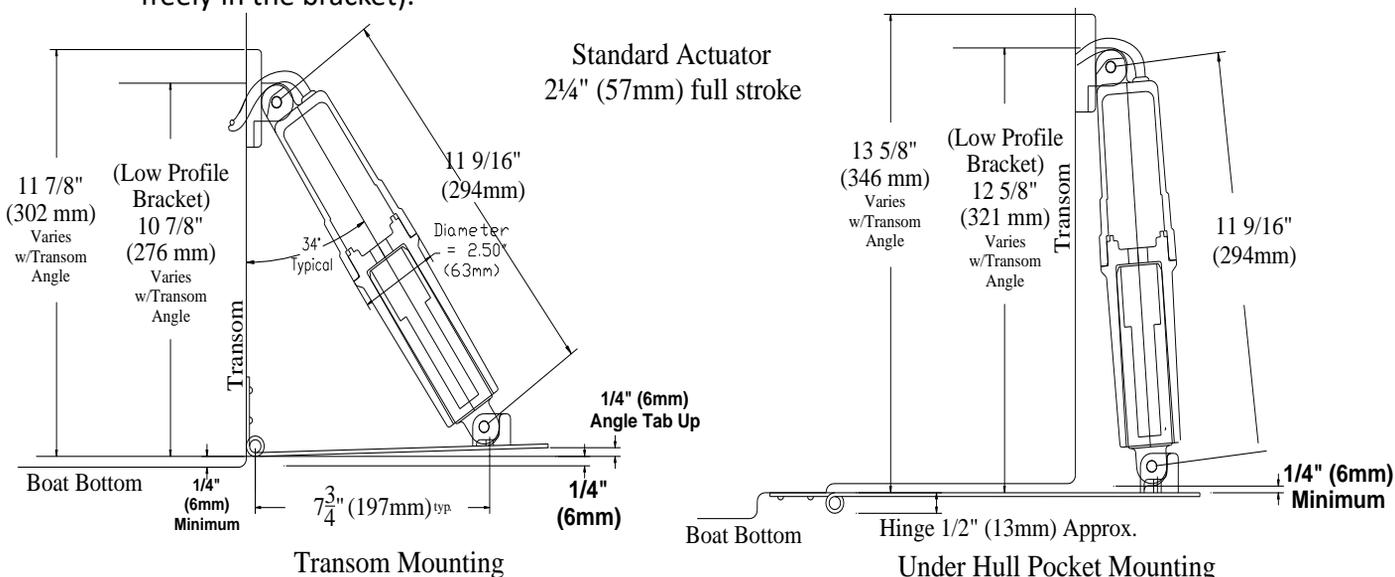


Fig. 2

# Actuator Installation

## BACK VIEW OF UPPER BRACKET

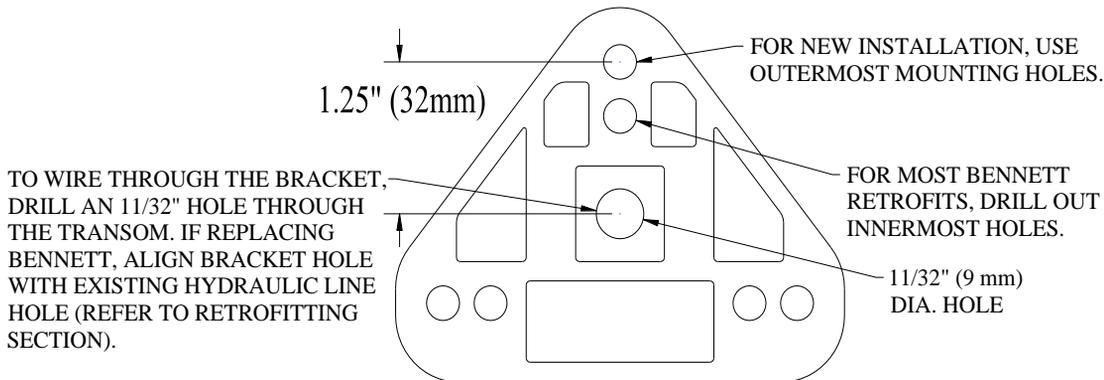


Fig. 3

# Actuator Wiring

## • KA Kits:

1. KA Kits include actuators with 6' (1.8m) extended cable and 20' (6.1m) 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](http://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), 4-conductor, 14 AWG (2.08mm sq.) cable (see Fig. 4). The cut end of 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](http://www.lectrotab.com) for a complete listing of trim tab kit contents.

# Flat Rocker Switch Wiring

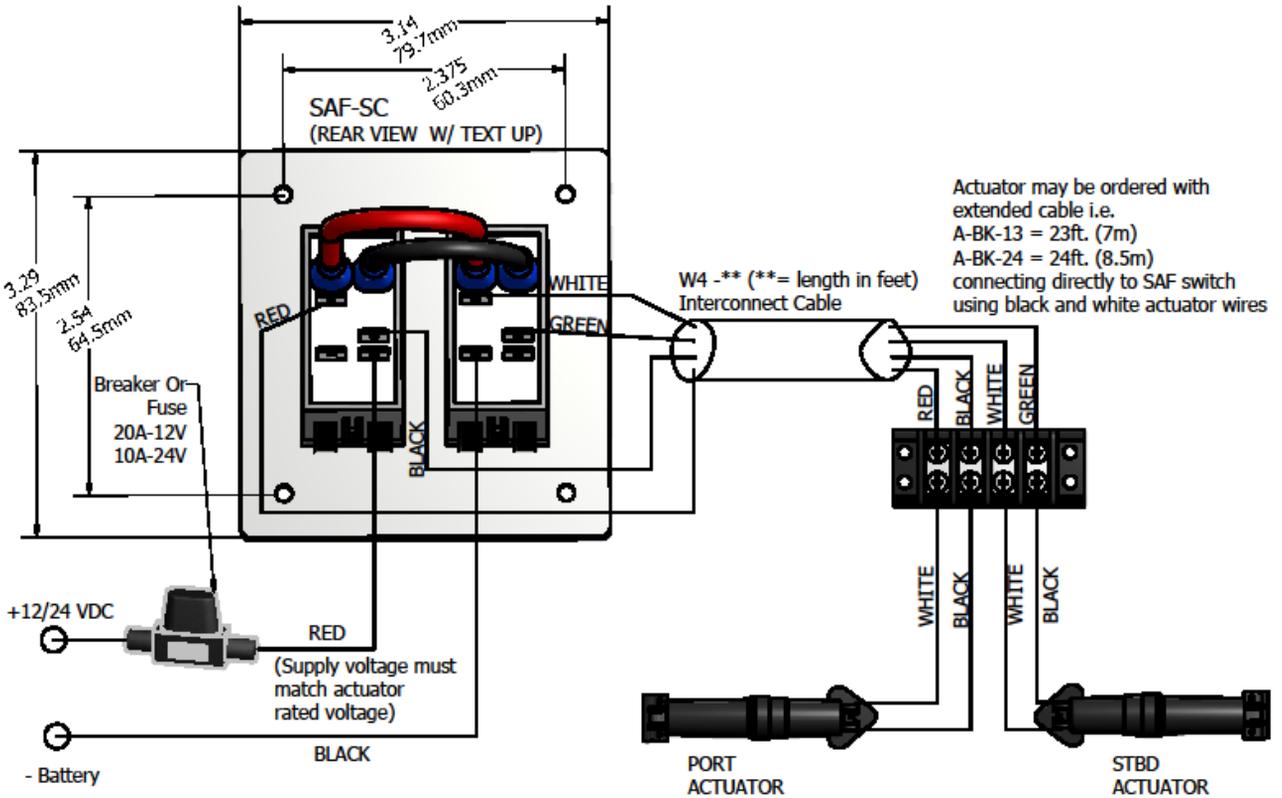


Fig. 4

# Flat Rocker Switch Wiring

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](http://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' (6.1m), 4-conductor, 14 AWG (2.08mm sq.) 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 or 24vdc power source as shown in Fig 4. **Power source voltage must match the actuator voltage.**
4. The cut out dimension to mount the Rocker Switch is 2.25" (5.7cm) X 2" (5.1cm). The switch panel is mounted with four #4 flat head screws provided.

# Oval (SETR) Switch Wiring

## "OVAL " (SETR) Control Installation/Wiring Diagram

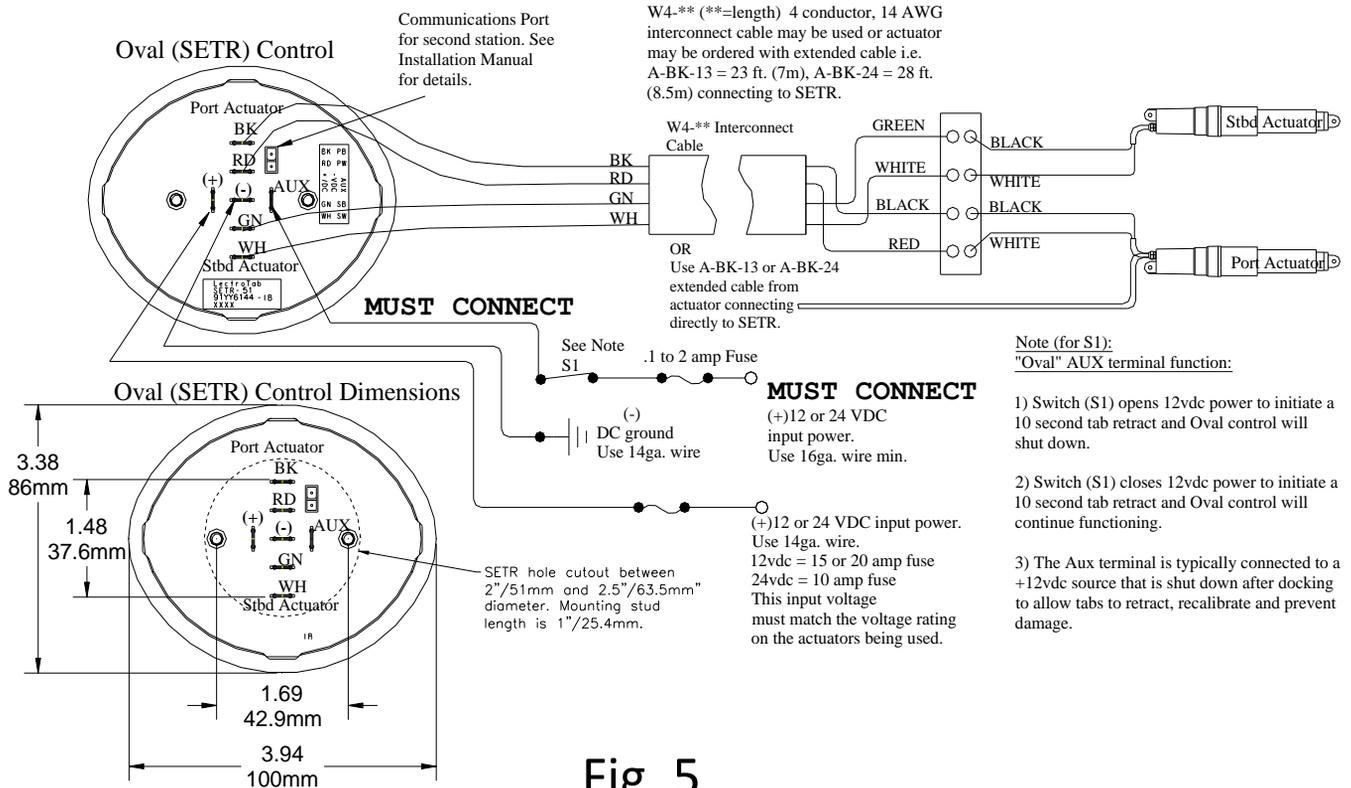


Fig. 5

## Oval (SETR-61) Switch Installation

1. The Oval control switch has LED indicators to show tab angle. For dual station applications, an SR cable for each Oval must be used. For dual station, dual actuators per tab applications or programming information, visit [www.lectrotab.com](http://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 Oval 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 Oval switch (KA Kits), or route the longer 23' (7m) actuator cable directly to the Oval 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 Oval 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 cut out dimension to mount the Oval switch is 2" (51mm) diameter. The switch panel is mounted with bracket and nuts provided. Lightly tighten nuts to mounting studs (**DO NOT OVERTIGHTEN**) (12 in-lbs./ 1.4Nm).

# Operation

- 1) Begin with the tabs fully retracted by pressing the two “BOW UP” or bottom switch buttons until the LEDs are flashing on the Oval or Wireless control 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” switch until you feel the boat’s port side begin to go down then release the upper left “PORT BOW DOWN” switch. The Oval and Wireless control will light LEDs on the right side of the control to indicate that the starboard tab is being deployed to lift the starboard transom up and causing the port bow or side to go down. If it is preferred to switch the LED indicator to the opposite side indicating the bow is going down, then please review the Oval or Wireless program chart at [www.lectrotab.com](http://www.lectrotab.com) under Products/Controls.
- 2) Press the bottom left “PORT BOW UP” switch until you feel the boat’s port side begin to come up then release the lower left “PORT BOW UP” switch.

## **Trimming the Starboard Side:**

- 1) Press the upper right “STBD BOW DOWN” switch until you feel the boat’s starboard side begin to go down then release the upper right “STBD BOW DOWN” switch. The Oval and Wireless control will light LEDs on the left side of the control to indicate that the port tab is being deployed to lift the port transom up and causing the starboard bow or side to go down.
- 2) Press the bottom right “STBD BOW UP” switch until you feel the boat’s starboard side begin to come up then release the bottom right “STBD BOW UP” switch.

## **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 until the top two LED 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 go down. Keep these buttons pressed until the boat achieves the proper level and then release the buttons. Press both BOW UP buttons to bring the bow back up if necessary.

# Troubleshooting

Problem	Cause	Solution/Test
<p>1</p> <p>Oval (SETR) LEDs do not light.</p>	<p>a</p> <p>The +12vdc or 24vdc and/or negative (-) power source to Oval has an open fuse, open breaker or open wire connection.</p>	<p>Connect a DC Voltmeter positive lead to +12/24vdc terminal (far left terminal) on Oval control, and the negative lead to the center terminal and meter should show +12 or 24vdc (see wiring diagram Fig 5). If not, check fuse, breaker and wiring.</p>
	<p>b</p> <p>The +12vdc or 24vdc connected to AUX terminal is switched to off state (see Note in Oval wiring diagram).</p>	<p><b>A Switched (closed contact) +12vdc or 24vdc MUST BE CONNECTED TO AUX TERMINAL for Oval control to energize LEDs and function.</b> 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 connect between the +12/24vdc terminal (far left) and AUX terminal (far right) to test Oval control for LED functioning. When jumper is connected, LEDs should light.</p>
	<p>c</p> <p>Oval control programmed to "LEDs OFF" state. See Oval program chart tab.</p>	<p>Enter Oval program mode under "LED's On/Off" and set to "LEDs ON" state. See Oval program chart tab at <a href="http://www.lectrotab.com">www.lectrotab.com</a> under Products/Oval.</p>
	<p>d</p> <p>In a dual station system, the second station Oval control LEDs do not light or function due to open 2 conductor communication cable or loss of 12/24vdc power to second station.</p>	<p>Test second station Oval control as in section (1a) described above. Test to make sure 2 conductor cable and plug 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 (1b) described above. If the jumper test in (1b) does not light the Oval LEDs, then replace the Oval control.</p>
<p>2</p> <p>Actuator does not deploy or retract tab when Bow Down or Bow Up is pressed on Oval control.</p>	<p>a</p> <p>Failed actuator, poor wiring connection or failed Oval control.</p>	<p>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 Oval control.</p>
<p>3</p> <p>Oval LEDs stay dim in sunlight.</p>	<p>a</p> <p>The Oval 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.</p>	<p>Shine a flashlight directly into the photo sensor located at the top center of the Oval control. If the LEDs brighten, the Oval control is operating properly. If the LEDs do not brighten, replace the Oval control.</p>
<p>4</p> <p>Oval LEDs stay bright during night.</p>	<p>a</p> <p>The Oval 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.</p>	<p>Cover your finger completely over the photo sensor located at the top center of the Oval control. If the LEDs dim, the Oval control is operation properly. If the LEDs do not dim, replace the Oval control.</p>



# LIFETIME WARRANTY POLICY

- Lectrotab standard actuators manufactured after October 1, 2009, are covered by a lifetime warranty to be free of material and workmanship defects for actuators installed on Lectrotab brand trim tabs with a Lectrotab control switch. Territories of Australia and New Zealand fall under and 7 year warranty for actuators connected to a complete Lectrotab system.
- The warranty period ends when the actuator becomes unusable for reasons other than material and workmanship defects.
- Standard actuator failures due to material and workmanship defects may be replaced with an exact or like model by obtaining a “Return Authorization” number from Lectrotab and sending the failed actuator back for warranty evaluation. If the returned actuator is deemed to be covered under warranty, a replacement actuator will be shipped to you ground freight, FOB Richmond, Virginia for domestic customers. An advanced replacement actuator may also be sent out prior to returning the failed actuator with a form of security provided by the customer or dealer. For International customers, please contact a Lectrotab distributor for warranty replacement information.
- Actuator failures due to normal wear and tear, misuse, abuse, neglect, negligence, incidental or consequential damages or a failure to follow Lectrotab’s written installation instructions are NOT covered by this lifetime warranty policy.
- This lifetime warranty policy does NOT cover labor cost, 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 “AK09” (K represents the month of October in alphabetical order (skip letter I) and 09 the year). The Oval control serial number date code is located on the back side of the control on a label (SETR-61-ASSY, 0623, 06 represents the year and 23 is the 23 week of the year).

## Lectrotab Part

Actuators

## Warranty Period

5 years for actuators with serial numbers prior to October 1, 2009 (\*K09\*\*)

**Lifetime** for actuators with serial numbers on or after October 1, 2009 (\*K09\*\*) (For warranty, actuators must be connected to Lectrotab brand tabs and control switch and one actuator per tab systems)

3 years from date manufactured for actuators installed with non-Lectrotab parts or dual actuator per tab systems (Australia and New Zealand fall under a 7 year warranty for actuators connected to a complete Lectrotab system)

Oval (SETR) 2 years

Rocker Switch (SAF type) 2 years

ALC & MLC Controls 2 years

Tabs (T or TA) 5 years

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