



Owner's Manual And Guide To Installation



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Disclaimer

- USE THIS DEVICE RESPONSIBLY.
- The SWITCHBLADE is designed to increase the size of the wake. PLEASE REMEMBER you may be held responsible for any damage your wake causes to other people's property.
- Before you take the first test ride, you should read and familiarize yourself with everything in this document. It is strongly recommended that all drivers experience operating the SWITCHBLADE before attempting to pull boarders.
 - o Learn the SWITCHBLADE's effect on the boat's wake.
 - o Learn the SWITCHBLADE's effect on the boat's handling at all speeds.
 - o Learn the SWITCHBLADE's effect on slow speed docking situations.

1 How to Use

1.1 Control Keypad

The Control Keypad accommodates all of the controls you will use to operate your SWITCHBLADE unit.



- ON / OFF – Depress 'SWITCHBLADE' to turn the unit on and off. When first turned on, the unit will do a self-check of its systems. When complete, the upper two lights will blink. The SWITCHBLADE is now ready to use.
- UP/DN – Press 'Up' to increase the size of the wake. Press 'DN' to decrease the size of the wake. Two rows of lights illuminate to indicate the position of the SWITCHBLADE.
- AUTO LAUNCH - This button activates the Automatic feature. When engaged, the SWITCHBLADE will raise and lower automatically to decrease gas consumption and planing time. Depress 'Auto Launch' to turn the feature on, get the boat up to the desired speed and set your preferred position of the SWITCHBLADE. When you return to idle the SWITCHBLADE will retract into neutral automatically. 12 seconds after the engine speed has reached 2000 RPMs, the SWITCHBLADE will automatically return to its previous position.

1.2 Mounting Hardware



- Mounting Plate – Mounts the SWITCHBLADE to the boat and provides the hinge for the rudder to pivot up and down AND swivel right to left.
- Pivot – Remove the pivot bolts to remove the rudder for long trailering situations. This will relieve undo stress on the mount and transom.

Note: The bottom bolt is smaller and made of brass. It acts as a shear pin in the event that something is hit below the water.

- Rudder – This is the vertical part of the SWITCHBLADE. It swivels freely to port and starboard as it follows the boat's rudder, enhancing the steering capabilities of your boat. It also pivots up and down to adjust the size of the wake.
- Blade – The Blade is the horizontal part of the SWITCHBLADE that actually forms the shape of the wake.
- Electric Rams – The electric rams actuate to move the rudder and fin for adjustments of the wake.

1.3 Auto Launch Details

The SWITCHBLADE has significant electronic programming developed into its system so the device will compliment the boat at all speed ranges and remember specific settings for the user.

- 1) AUTO LAUNCH – When blue 'LAUNCHED' indicator is NOT illuminated, the unit is in Manual Mode. In the Manual Mode the user can activate the rams up and down when the engine is off. This allows for the user to move the rams with their boat on the trailer. Manual Mode ONLY runs the rams up and down. It does not activate the programmed part of the system.
- 2) The program is activated when the engine is running and the blue 'LAUNCHED' indicator is lit.
 - a. At idle (2000 RPMs or less), the electronic program sends the device to the "neutral" position. The neutral position has no affect on the boat's trim and its wake. The UP / DN will not respond.
 - b. Once the engine achieves 2000 RPMs, the operator can activate the device to raise or lower the wake to the boarder's liking by pressing the UP / DN. The last position used will then be kept in the program memory until the unit is turned off.
 - c. When engine speed drops below 2000 RPMs the device will return to neutral. The UP / DN will not respond.
 - d. When wake boarding is resumed and the boat again reaches 2000 RPMs, the device will return to the last used and memorized position. The UP / DN will again respond.

1.4 Trailing with the SWITCHBLADE

Be especially cautious when trailering with the SWITCHBLADE rudder in place. The SWITCHBLADE is designed to be HIGHER than the boat's original running gear (rudder and propeller). Therefore, the SWITCHBLADE should clear any obstacle the boat clears. Please remember that it is mounted aft and there is a chance of it hitting ground. It is recommended that the SWITCHBLADE's rudder be removed from the boat if you plan to trailer your boat for extended distances. You may want to do this to relieve undue stress on your transom and remove the possibility of hitting anything with the SWITCHBLADE's rudder. Remove the rudder by taking out the two bolts on the rudder swivel AND removing the swivel pin from the bushings. The rudder will slide AFT off of the pin. Place the pin back on the rudder and store them in a safe place. When replacing the rudder, note that the bottom bolt is smaller so that it might shear first in the case of hitting something. Replace the pin with the small hole to the bottom, insert the top bolt first, then the bottom (smaller) bolt. While you are there, inspect the part for any signs of wear.

1.5 Maintaining your SWITCHBLADE

The SWITCHBLADE exterior parts are made of stainless steel and will hold up to the rigors of a water environment, but it still needs to be maintained. Pivotal suggests these regular maintenance procedures.

- 1) Visually inspect all parts for smooth operation before each session.
- 2) Always rinse the exterior off with fresh, clean water after use in salt water.
- 3) Check all bolts for tightness once per month.
- 4) Make sure your rams "FREE WHEEL" when at minimum and maximum travel. Test this by running the rams all the way in. Listen for both of the rams to keep running WITHOUT any groan. Do the same test with the rams all the way out.

2 INSTALLATION Procedures

2.1 Disclaimer

Installation of the SWITCHBLADE should be performed by a trained mechanic. Installation of this device can be achieved with basic tools and understanding of fiberglass and mechanical principles. However, Pivotal Designs, Inc. cannot accept liability if installation is attempted by anyone other than an authorized dealer. Pivotal Designs, Inc. is not responsible for damage incurred to the boat from improper installation of this part.

2.2 Parts and Tool List

Parts List (provided)

- 1) Lifting Arm Assembly with rams and wire leads
- 2) Backing Plate
- 3) Blade
- 4) Control Module
- 5) Wire Harness
- 6) Control Keypad
- 7) Assorted hardware

Tool List (not provided)

- 1) Drill
- 2) 1/2 inch drill bit
- 3) 3/8 inch drill bit
- 4) 3/4 wrench
- 5) 5/16 socket and appropriate ratchet
- 6) Wire strippers
- 7) Wire cutters
- 8) Wire crimpers
- 9) Tie wraps
- 10) Countersink
- 11) Masking tape
- 12) Silicone sealant
- 13) 30 amp Fuse and holder
- 14) Antiseize paste

2.3 Lifting Arm Assembly

2.3.1 Setup

The transom lifting arm assembly will be installed first. The area need is approximately 10 inches wide by 6 inches high **DIRECTLY ABOVE** the keel or centerline of the boat.

Note:

Outside – If this area has a trim tab installed; it will need to be removed.

Inside – Remove the gas tank, exhaust manifold and anything else on the centerline of the boat near the transom. Holes will be drilled through the transom so access is needed to this area.

Important:

It is vital to the function of the SWITCHBLADE that the transom is 90° in the vertical plane to the plane of the keel. If your transom is anything other than this, contact your SWITCHBLADE representative before drilling any holes. A custom shim may be needed for proper mounting.

2.3.2 Installation

2.3.2.1 Prepare the gelcoat by placing some **MASKING TAPE** on the area where the holes will be drilled. The masking tape will help keep the gelcoat from chipping.

2.3.2.2 Place the backing plate directly above the drain plug and trace the hole pattern onto the transom. The **CENTERLINE** of the pattern should be measured 18 to 20 inches **UP** from the bottom of your rudder or the bottom of the template should be 1-2 inches above the bottom of the keel.



Note:

It is extremely important to find the exact centerline of the hull. **DO NOT** measure from exhaust ports, platform brackets, speedometer pickups, etc, as these **MAYNOT** be symmetrical. The best place to measure is from the chine or bottom outside corner of the boat.

2.3.2.3 Once Marked, proceed drilling the 4 major holes (1/2"), then the 2 minor holes (3/8").

Tip:

Start each hole with a small pilot hole, such as 1/8". After these holes are drilled, ensure that the holes did not puncture anything on the interior of the boat. Then use a countersink to bevel the edges. This will reduce the possibility of any crazing of the gelcoat later on. You should use progressively bigger drills until you've reached the desired size, this will also reduce the chance of crazing or cracking the gelcoat.

- 2.3.2.4 Next, install the lifting arm by bolting thru the mounting plate, thru the transom and thru the backing plate. Seal each hole with a silicone sealant. Thread the nuts on the inside of the boat and torque down appropriately.

Note:

Use ANTISEIZE on all stainless steel bolts. Stainless steel nuts HEAT up when turned on their bolt. They WILL seize (weld themselves to the bolt) if you work them too fast or don't put an antiseize paste on them. If you use a ratchet, MOVE SLOWLY when threading the nut in place.

- 2.3.2.5 Now that the lifting arm is installed you will need to slide the actuator wires thru the 3/8" holes in the transom. Seal with silicone, then fish the ram wires up to the dash area. Use wire ties to secure these wires in place as you move forward, making sure they do not come in contact with moving engine parts or exhaust system components.

- 2.3.2.6 Install the Blade Assembly to the Lifting Arm by inserting the pivot through the plastic bushings. Insert the top hole of the blade into the top slot of the pivot. Insert the STAINLESS STEEL bolt and nut. Now insert the bottom hole of the blade into the bottom slot of the pivot. Insert the BRASS bolt and nut. Tighten both bolts.



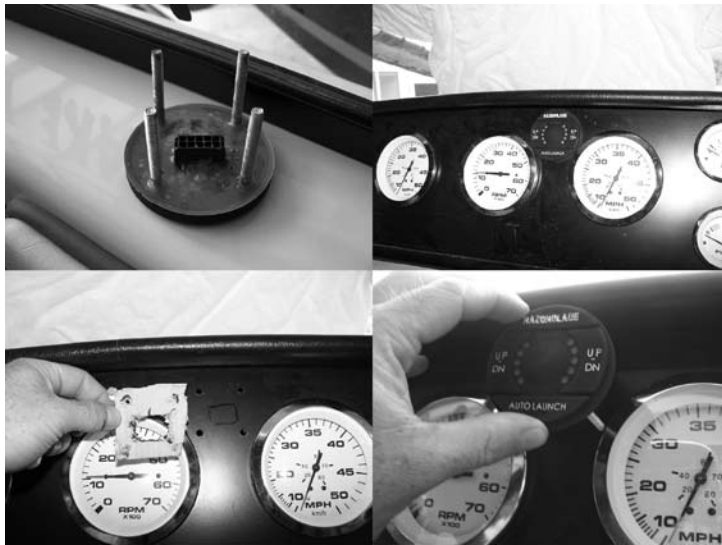
- 2.3.2.7 Ensure that all other bolts in the assembly are tight.



2.4 Electrical Assembly

Important: Before performing any work with electronics, remove the negative (-) lead from the battery.

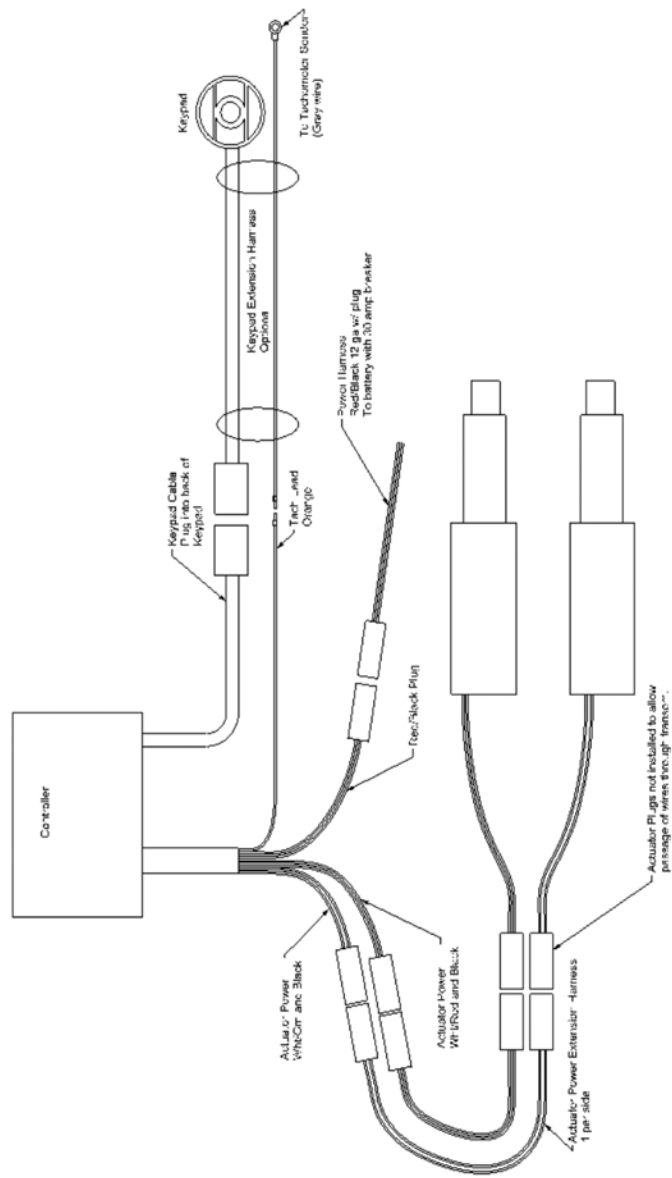
- 2.4.1 Find a place to mount the Control Keypad. Ensure that the appropriate controller leads will reach the battery, dash and actuator leads.
- 2.4.2 Once at the dash, decide if you will use an “empty” hole in the existing dash for your Control Keypad such as a clock. You will need a location for a 2 1/8” gauge. If there isn’t an “empty” hole, you can make a pattern for the 4 posts and square plug. Use a drill/ or Dremel tool to remove material for the Control Keypad. Fish the Control Keypad wire through the dash and connect appropriately. Use the plastic nuts to secure the Control Keypad to the dash.



- 2.4.3 Proceed to install the power wires leading from the Control Keypad. Two wires will be connected directly to the battery, one positive (+, red) and one negative (-, black). Insert a 30 amp resettable breaker in the positive line.
- 2.4.4 Plug the lead wires from the actuators into the Control Module.



2.5 Wiring Diagram



2.6 Installation TESTS and Troubleshooting

2.6.1 Dry Testing.

2.6.1.1 Power the system up by pressing "SWITCHBLADE" at the top of the Control Keypad.

2.6.1.2 Press "UP" to raise the unit and "DN" to lower the unit. The blade should travel up and down appropriately. If this doesn't happen, check your wiring. Watch the gauge to make sure it is moving in the right direction. If this doesn't happen, check your wiring.

2.6.1.3 Press 'Auto Launch'. The unit should retract to the neutral position.

2.6.2 Wet Testing.

2.6.2.1 After starting the boat, turn the unit on and place in manual mode.

2.6.2.2 While driving at preferred speed (above 2000 RPMs) set the trim of the unit to the desired setting using UP/DN.

2.6.2.3 Press 'Auto Launch', blue 'LAUNCHED' indicator will be illuminated.

2.6.2.4 Lower engine speed to under 2000 RPMs and check to see if unit retracts.

2.6.2.5 Raise engine speed back to 2000 RPMs and check if unit returns to prior setting.

2.6.2.6 Check bilge for water intrusion.

2.6.3 Dry Testing 2.

2.6.3.1 Ensure all bolts are tight.



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