

BOW & STERN THRUSTER

INSTALLATION MANUAL **230/340/350 SERIES**

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INTRODUCTION

Thank you for your purchase of a Sideshift thruster system.

Sideshift thrusters are designed for easy installation by anyone with basic mechanical and electrical skills.

This manual explains everything you need to know about installing your Sideshift thruster.

We also provide unlimited telephone support at [1.877.325.4787](tel:1.877.325.4787).

Also see our website for helpful installation videos at sideshift.com/choose-sideshift/videos/videos/.

This manual explains the different types of thrusters, the parts, tools and procedures required to install them, the electrical system that supplies power to the thruster motors, as well as maintenance and troubleshooting procedures.

We recommend that you familiarize yourself with the entire manual before starting your installation.



Safety warnings

- WARNING:** Ensure main ignition is turned off and motor control breakers are open when conducting maintenance and repair of the thruster.
- WARNING:** Use extreme caution when swimmers are in the area of the thruster. Turn off ignition and avoid contact with thruster props when boat is stationary.
- WARNING:** To prevent overheating when operating the Sideshift thruster, run for a maximum of 30 seconds at a time, then allow to cool for at least 10 seconds before further operation.
- WARNING:** When operating out-of-water do not run thruster for longer than 5 seconds to prevent overheating.
- WARNING:** If conducting an in-water installation, use a cordless drill only, as a corded drill can present an electrocution hazard.



MODEL TYPES

There are two basic types of Sideshift thruster systems: bow thrusters and stern thrusters.

Electrical connections and controls for both types are similar, however placement and mechanical attachment details vary between the two types of thrusters.

Our thrusters do not retract or deploy. They are permanently fixed to the boat and rise out of the water when the boat planes, creating no drag. They also work well on displacement type hulls and will create no noticeable drag, nor will they affect handling.

Bow Thruster Models

Model	Suitable Boat Length	V DC	Current	HP	No. Props
SS230	20-35 ft. (6.1 – 10.7 m)	12	300 A	2.5 HP	Single prop
SS340	30-45 ft. (9.1 – 13.7 m)	12	550 A	5.0 HP	Dual prop
SS350	40-60 ft. (12 – 18.3 m)	24	400 A	7.5 HP	Dual Prop

Stern Thruster Models

Model	Suitable Boat Length	V DC	Current	HP	No. Props
ST340	20-45 ft. (6.1 – 13.7 m)	12	550 A	5.0 HP	Dual Prop
ST350	40-60 ft. (12.2 – 18.3 m)	24	400 A	7.5 HP	Dual Prop



PARTS AND TOOLS

Bow Thruster Parts

Item	Photo	Purpose
Upper section and top cap		Secures thruster base to hull. Covers and protects through-hull connections
Bow thruster base with motor		Propeller and motor
Clamp Strap Assembly (1)		Secures thruster base to hull.



Center Bolt (2: one short, one long)		Attaches clamp strap to thruster
Lock Nut (1)		Locks center bolt in place
Threaded hull insert and bolts (2)		Secures clamp strap assembly to hull.
Hull insert epoxy kit		Cements threaded hull inserts in place
Top through bold assembly		Secures top of upper section
Side screws (2)		Secures upper section cowling



Stern Thruster Parts

Item	Photo	Purpose
Stern thruster base with motor		Propeller and motor
Seal washers (4)		Interface between nut and mounting flange.
Mounting nuts and bolts (4)		Secure mounting flange to hull.
Backing plate		Placed inside transom, opposite thruster mounting flange to prevent bolt head pull-through.



Common Parts

Item	Photo	Purpose
Joystick (single)		Control bow or stern thruster.
Joystick (Dual)		Control bow and stern thruster when both installed.
Motor Controller		Relays commands from joystick, delivering high current from battery to motor.
Anti-seize		Prevents screw and bolt threads from seizing, facilitating easier assembly and disassembly.
Heat shrink tubes (sufficient for all cables attached to motor controller. Cut to size)		Provides waterproofing for cable at battery terminals.



Terminal protectors		Protects terminals from moisture and prevents shorts.
Compression terminal pairs: 1&2, 1/0 and 2/0 AWG for thruster cables, SS230, all other models respectively.		Connects cables to motor controller. Select size according to wire gauge used.

Additional Parts

Part	Image	Purpose
Extension pillars		Available in 5", 10" and 15" lengths. Choose according to installation configuration to gain appropriate propeller depth.
Stern angle bracket		Allows transom mounting
Swim platform backing plate		Placed on top of swim platform, opposite stern thruster mounting flange.



<p>Wireless Key Fob (Optional)</p>		<p>Allows un-tethered operation of thrusters. Suits all thruster models.</p>
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Required Tools and Unsupplied Materials

- Cordless DC drill
- Water-proof angle drill (optional, for in-water installations)
- Heat gun
- $\frac{3}{8}$ " drive torque wrench
- #2 Phillips screwdriver
- Wire stripper
- Wire crimper
- $\frac{7}{8}$ " socket
- SAE wrench set $\frac{3}{8}$ " to $\frac{3}{4}$ "
- Pliers
- $1\frac{1}{2}$ " joist drill bit
- $\frac{1}{2}$ " 13 mm drill bit
- Drill bits up to $\frac{1}{2}$ "
- $\frac{3}{16}$ " hex socket driver
- Caulking gun
- Hacksaw
- Sikaflex or equivalent sealant



ELECTRICAL COMPONENTS

Battery Requirements

The batteries supplying the thruster must be capable of supplying the required CCA (Cold Crank Amps), as outlined in Table 1: Required Battery Characteristics. Insufficient battery capacity will lead to poor thruster performance. The battery must have threaded posts.

ST/SS Model	Qty	Voltage	Total CCA (A)
230	1	12	850
340	2	12 V	1700
350	2	24 V	1700

Table 1: Required Battery Characteristics

NOTE: It is essential that the cold cranking ampere (CCA) requirements are met as outlined in the table above.

Deep discharge batteries must be sized larger than starter batteries to supply an equivalent CCA rating. This is generally more expensive than using starting batteries.

Batteries must be installed as close to the motor controller as possible for optimum performance. If you are installing batteries in a non-ventilated area you will need to use AGM (absorbed glass mat) sealed batteries or sealed combination (starter/deep cycle) batteries. In ventilated areas, you can install flooded starting batteries or unsealed combination (starter/deep cycle) batteries.

BATTERY CAPACITY AND AGE

Under normal circumstances with new and fully charged batteries, you can expect around 50 thruster cycles before the battery must be recharged.

It is advisable to recharge batteries after each use if possible, to extend the life of the battery.

As batteries age and with repeated charge cycles, the battery slowly loses its ability to hold charge. The deeper the discharge before recharging, the shorter the life of the battery. Over time it will be able to supply fewer thruster cycles before it requires recharging and eventually will lack the capacity to allow proper thruster performance.



Capacity reduces to the point that performance is poor or few thrust cycles are available before recharging, and the batteries must be replaced.

BATTERY STORAGE

Over time, batteries self-discharge, even when disconnected. Some new batteries may have a self-discharge of 1-2% per month, but depending on the type and age of the battery, it can rise to 6% per month or more.

If the battery is coated with moist dirt and corrosion by-products, discharge rates can be even higher. Make sure the battery is clean and free of dirt and corrosion on and around the terminals.

If the battery is a flooded type, top up the electrolyte, ensuring that it is above the plates and below the vent cap well.

Fully charge the battery before storage, and store in a cool, dry place. Cooler batteries will self-discharge at a lower rate than warm batteries.

Check the terminal voltage of the battery periodically. When the terminal voltage drops below 12.4 volts (75% capacity), charge it until fully charged. More frequent charging is preferred if convenient. It is recommended to charge the battery every three months.

Note that as charge capacity decreases, the freezing point of the electrolyte increases. This is important because the electrolyte must not be allowed to freeze. At 62% capacity, the freezing point is $-26.5^{\circ}\text{C}/-16^{\circ}\text{F}$; at 85% capacity, it is $-52^{\circ}\text{C}/-62^{\circ}\text{F}$.

CONNECTING BATTERIES IN PARALLEL TO BOOST CCA

You can double the CCA supplied from a single battery by connecting a second battery in parallel to the first. You may prefer this alternative to buying a larger single battery with the required CCA rating.



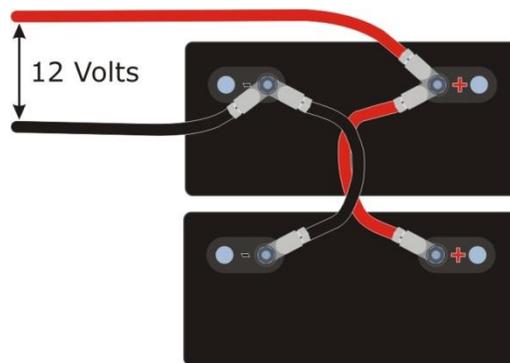


Figure 1: Two batteries in parallel, doubling CCA

If you use a parallel configuration, the two batteries must be identical: same rating and same manufacturer and ideally new batteries, or at least operated as a pair for their entire service life. Each battery must be charged separately before installing to ensure they start at the same charge level. Batteries which are dissimilar in any way may not charge and discharge equally, leaving one battery undercharged.

To connect two batteries in parallel, prepare two shunt cables of the same gauge used to connect the batteries to the motor controller. Connect the positive post of one battery to the positive post of the other and the negative post of one battery to the negative post of the other.

One post will share two compression terminals: the shunt and the cable to the motor controller.

24 VOLT BATTERIES

24 volt batteries are less common than 12 volt batteries. You may find it more convenient and less expensive to use two 12V batteries in series. If required, you can use four batteries, with two sets of series-connected batteries in parallel to supply the required CCA.

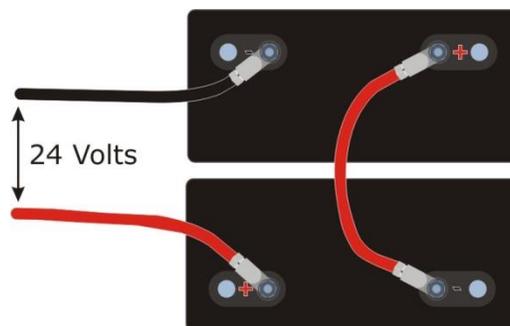


Figure 2: Two 12 V batteries in series, providing 24 V



To connect two batteries in series, connect the negative post of one battery to the positive post of another using a short piece of battery cable of the same gauge used to connect the batteries to the motor controller. The two remaining posts are each connected to the motor controller using two battery cables, supplying 24V.

PREPARING SHUNT CABLES

To prepare a shunt cable:

STEP 1: ARRANGE BATTERIES

You may choose to arrange batteries in different ways: side by side, end to end etc. For a parallel CCA-boasting configuration, arrange the two batteries so the positive and negative posts of each battery are on the same side as the other, as shown in Figure 1.

STEP 2: MEASURE CABLE

Cut cable or cables to length based on the battery arrangement chosen in Step 1 above.

You need one shunt cable for series configuration and two for parallel configuration, as explained in the Connecting Batteries in Parallel to Boost CCA and 24 Volt Batteries sections above.

STEP 3: INSTALL COMPRESSION TERMINALS

- a. Slip shrink tube past both ends of each cable then attach compression terminals, as explained in [How To Install Compression Terminals on page 41](#).
- b. Slip shrink tube over shaft of compression terminal, leaving the ring exposed.
- c. Apply heat evenly to the shrink tube until it forms a tight seal around the terminal and cable.



USE OF EXISTING BATTERIES

Existing batteries can be used for the thruster, but this option must be considered with caution. CCA requirements must be met, and you must consider how deeply the batteries will be discharged before charging can occur if the thruster load is added to the original load on the battery.

Deep Discharge Bank

If an existing bank of deep discharge batteries can supply the CCA requirements, this could be an option if they are located close enough to the thruster being powered - See [Cable and Terminal Requirements](#) on page 17. A battery at 40% capacity will supply about .8 volts less than a fully charged battery, which will reduce performance of your thruster.

Windlass Batteries

It is possible to share an existing battery bank for a windlass, providing it has sufficient capacity to meet both windlass and thruster usage, and is close enough to the bow to supply the bow thruster. It is not recommended to power the stern thruster from the windlass batteries due to the need for longer cable runs. Supplying both bow and stern thrusters from a single battery is not recommended. The more deeply discharged a battery becomes before it is recharged, the fewer charge cycles it can provide in its lifetime, so if both thruster and windlass are used to a point where battery capacity drops below 75% before recharge, it is probably less expensive to provide a separate battery bank dedicated to the thruster.

The cable gauge, CCA and circuit protection already in place for the windlass must be compatible with the thruster in order for this approach to work. We do not recommend using windlass batteries for our SS350 bow thruster. See table below:

Thruster	Cable AWG	CCA	Circuit Protection
230	1/0	850 or greater	300 A peak
340	2/0	1700 or greater	550 A peak
350	2/0	1700 or greater	400 A peak

Table 2: Shared Battery Requirements

All Sideshift motor controllers have built in breakers for protection.

Cable and Terminal Requirements

Due to the high current load drawn by the motors, it is essential that the correct type of cable and connectors are used, and that maximum cable length guidelines are observed according to the gauge and thruster model. These guidelines are summarized in the table below. The table assumes cables from the thruster to the controller have not been shortened.



Cable must be high quality tin coated copper, marine grade cable. Cable ends must be fitted with high grade cast copper, tin coated compression type terminals and sealed with double wall heat shrink tubing for moisture protection.

Cables from the motor are 10 feet and 4 AWG. This lighter gauge of cable is used to allow for easier routing between the motor and controller. It is essential that cable from battery to controller is much heavier gauge or the motor will not perform properly and could be damaged.

NOTE: SAE gauge can have up to 12% less conductor cross-section than AWG. Use cables of equal or greater AWG as suggested below.

Thruster	Length – 1/0 AWG	Length – 2/0 AWG
230	30'	
340		40'
350		50'

Circuit Breaker

Two circuit breakers are located on the motor controller.



Figure 3: Circuit breaker

If the unit does not respond to the joystick, check the circuit breakers. The illustration in Figure 3 shows the breaker in the tripped (off) position. To reset, rotate the yellow lever counter clockwise into the body of the breaker. To turn off, press the red button.



INSTALLATION OVERVIEW

Thruster installation involves three main phases: thruster, joystick and electrical installation.

There are differences between installing a bow thruster and a stern thruster, although they share many common elements. Instructions for each type of installation are covered separately below.

Electrical installation and joystick installation are similar for bow and stern thrusters. Each is covered in a separate section.

Note that if you are installing both a bow and stern thruster, each thruster must have a separate electrical installation, including batteries, motor controller and joystick receiver. They can share a dual joystick which has two joysticks on a single unit, or use two separate single joysticks.



INSTALLATION INSTRUCTIONS

– BOW

Bow thrusters can be installed with the boat in water or on land, although land-based installation is easier.

In order to obtain the strongest possible epoxy bond, installation should be performed when the hull is dry, clean and the epoxy and hull surface temperature is between 70°F/21°C and 75°F/24°C .

Get an overview of the installation procedures by viewing the installation videos online at sideshift.com/choose-sideshift/videos/videos/.

Bow Thruster Placement

The bow thruster is located on the center line, with the top of the propeller at least 5 inches (12 cm) below the shallowest waterline. The cables and air vent pass through the hull above the waterline.

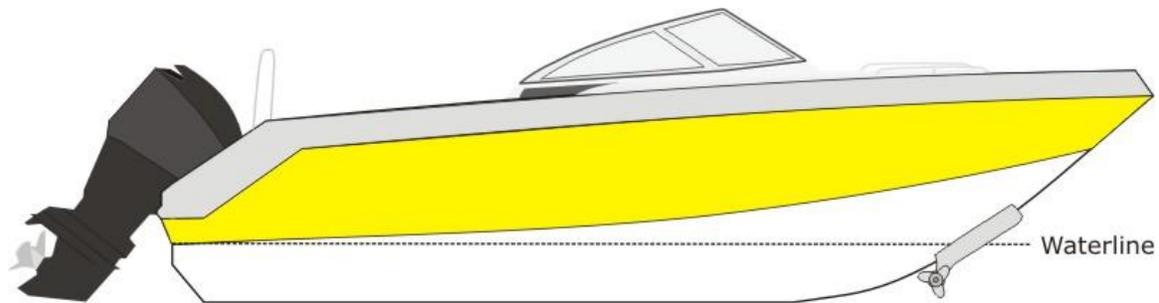


Figure 4: Bow Sideshift thruster placement



Step-By-Step Instructions: Bow Thruster

STEP 1: DETERMINE WATERLINE



The propeller must be at least 5 inches (12 cm) below the shallowest waterline and ideally out of the water when planing, so determining the waterline is a crucial first step to installation.

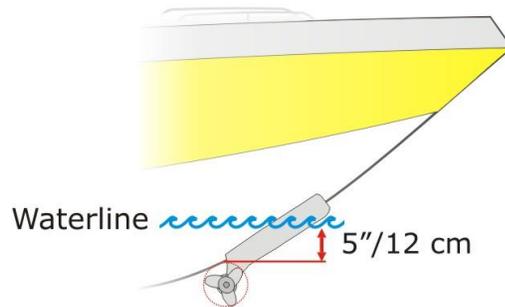


Figure 5: Top of propeller 5" (12 cm) below water line



NOTE: Be sure to determine the waterline with an empty boat to ensure thruster placement will keep the propeller a minimum of 5" (12 cm) below the waterline in the worst case scenario.

The water stain on the hull is a good indication of typical waterline over a range of conditions. Use the lowest indication of waterline if a water mark is visible.

If no water stain is visible, the waterline must be marked while the boat is in the water. With the boat completely unloaded (fuel tanks empty but standard equipment in place), mark the waterline near the bow of the boat with a grease pencil.

STEP 2: POSITION CLAMP STRAP



- a. Dry fit the clamp strap such that the holes at the end of each flange are between 2" and 6" (5 and 15.25 cm) above the waterline. Mark the position on the bow with tape. Duct tape works well.
- b. Verify that drilling the hole locations selected in step a. above will not damage anything on the inside of the boat, for example a water tank or wiring etc. If in doubt, contact the boat manufacturer.

WARNING: Verify that the proposed location to drill the anchor holes and cable holes as determined above will not interfere or damage anything on the inside of the hull.

- c. Remove the two sided-tape backing on clamp strap.
- d. Reposition the clamp strap at the location marked above and fasten in place using the attached two-sided tape.



STEP 3: DRILL HULL INSERT HOLES

NOTE: A water-proof angle drill may be required to drill the following holes if the boat is in the water.

WARNING: If in-water installation, use a cordless drill for the following procedure. A corded drill presents an electrocution hazard.

WARNING: Epoxy is an irritant. Wear eye protection and use disposable plastic gloves when handling epoxy.

- a. Using a 5/16" or 8 mm drill bit, drill pilot holes through the hull at the center of each hole on either side of the clamp strap.
- b. Remove the clamp strap.

NOTE: If you have access to the inside of the boat you can use the 5/16 bolt with a nut and washers instead of the hull insert at this time before the next step. Be sure to seal the hole with Sikaflex or equivalent sealant.

- c. Using a 1/2" or 13 mm drill bit, enlarge each pilot hole.
- d. Clear debris from holes to ensure good epoxy adhesion.

STEP 4: INSTALL HULL INSERT



NOTE: Surface must be dry before drilling otherwise epoxy may not form a strong bond between hull and insert.

NOTE: Epoxy will form the strongest bond when the surface of the hull where the inserts are installed is between 21°C/70°F and 24°C and 75°F.

NOTE: Wear disposable latex or plastic gloves for the following procedure.

NOTE: If inside access is available, clamp strap can be held in place with nuts and bolts rather than with the hull inserts.

- a. Make sure hull surface and drilled holes are dry. If not, wipe dry then gently apply heat to surface with heat gun, taking care not to over-heat.
- b. Load epoxy tube into caulking gun.
- c. Flush nozzle with epoxy until you get a stream of consistently coloured epoxy. It will start off almost white and become progressively darker blue. When it is a consistent shade of blue, it is ready to apply.

NOTE: Ensure epoxy is mixing properly before applying to hull or insert otherwise it will not set properly.

Perform steps d – g on each insert:

- d. Thread insert onto a bolt, providing a convenient handle.
- e. Spread an approximately 1/16" (1.5 mm) thick layer of epoxy on the outer surface of the insert **and** on the inside of the hole.
- f. Push hull insert into the hole in the hull until the top of the hull insert is flush with the hull.
- g. Remove excess epoxy.
- h. If access is possible, apply additional epoxy to each insert on the inside of the hull.
- i. Allow time for epoxy to cure before proceeding with mechanical installation.



- NOTE:** Be sure to keep epoxy clear of insert/bolt threads or bolt could become permanently bonded to insert.
- NOTE:** Epoxy must harden for at least 45 minutes at 25°C/77°F before proceeding with the remaining steps. Less time is required for elevated temperatures and more time for cooler temperatures.

STEP 5: FASTEN CLAMP STRAP



- a. Apply anti-seize compound (included with thruster kit) to threads of the hull insert bolts.
- b. Apply Sikaflex or equivalent sealant under clamp strap to ensure a sealed joint
- c. Use a $\frac{3}{16}$ " hex socket driver or hex key to torque the hull insert bolts to 10 foot-pounds, or until firm but not over-tightened.
- d. Adjust the center bolt at the apex of the clamp strap: loosen the jam nut, adjust to center, retighten jam nut.



STEP 6: ATTACH THRUSTER BASE

- a. Arrange wires and air line to either side of the clamp strap bolt.
- b. Pass clamp strap bolt through slot in thruster base.
- c. Install washer and thread nut onto center bolt.

NOTE: If bolt is too short to engage all threads of the nut, install the longer center bolt (supplied).

- d. Adjust the depth of the propeller relative to the waterline marked on the boat such that the top of the propeller blades are at least 5" (12 cm) below the waterline.



NOTE: The top of the propeller must be at least 5" (12 cm) below the waterline when boat is at its lightest operating weight.

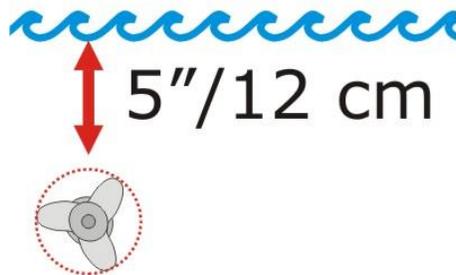


Figure 6: Propeller at least 5" (13 cm) below waterline

e. Tighten nut to 10 foot-pounds.

NOTE: Nut has to be tight enough to hold fast but not so tight that cowling is hard to install. Once installed, the thruster should be solidly attached to the boat. If the thruster is loose the nut needs to be tighter.

- f. Using a hack saw, cut off excess threads beyond nut.
- g. Using light taps with a hammer, bevel the rim of the bolt at the end of the bolt. This prevents the nut from working loose during operation.



STEP 7: FEED WIRES AND AIR LINE THROUGH HULL

- a. Temporarily slide the cowling from the top of the thruster frame into place. Mark outline with tape.
- b. Using the tape markings as a guide, drill two ½" (13 mm) holes and one ¼" hole through the bow of the boat within the tape markings. These accommodate the power cables and airline. Remove the cowling.

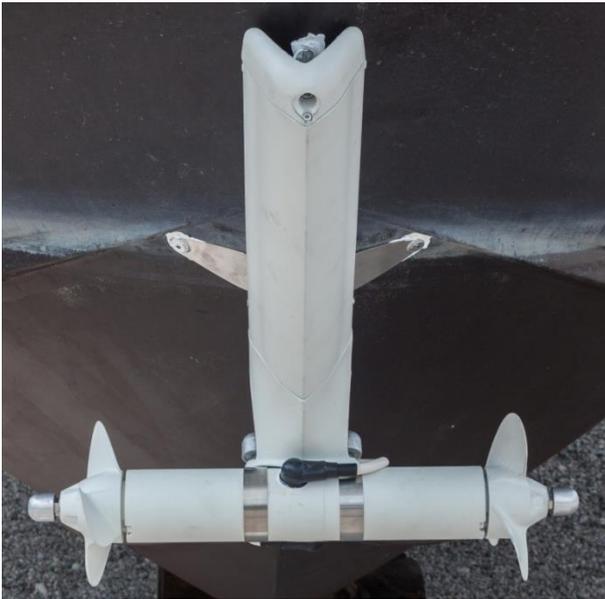
WARNING: Verify that hole placement will not interfere with or damage anything inside of the hull, and that there is sufficient space so that cables can be accessed after passing through the proposed hole location.

- c. Pass the cables and air line through the hull, one per hole.
- d. Seal holes with Sikaflex or equivalent sealant.



NOTE: The air line prevents pressure buildup on the seals due to temperature changes. Air line must be positioned so that the open end is dry. Tube must not be kinked, crimped or damaged.

STEP 8: INSTALL COWLING



- a. Remove marking tape.
- b. Slide cowling in from the top of the thruster unit.
- c. Push cowling all the way down.
- d. Using the hole at the top of the cowling as a guild, drill a $\frac{3}{8}$ " hole through the bow to accommodate the top bolt.
- e. Fasten side screws.
- f. Apply Sikaflex or equivalent sealant to the hole from the outside.
- g. Pass bolt through top hole. Slide washer and nut in from the inside of the boat. Tighten snugly with a wrench.

WARNING: Epoxy must cure for at least 24 hours at 25°C/77°F before operating the thruster. Less cure time is expected for elevated temperatures and more time for cooler temperatures.



INSTALLATION INSTRUCTIONS

– STERN

Stern thrusters can be installed with the boat in water or on land, although land-based installation is more convenient.

Get an overview of the installation procedures by view the installation videos on-line at sideshift.com/choose-sideshift/videos/videos/.

Stern Placement

There are three guidelines you must follow to successfully place a stern thruster:

1. The top of the propellers must be at least 5 inches (12 cm) below the waterline.
2. The area beside each propeller must be clear to the edge of the boat or the thrusters will not provide turning power. For example, a thruster cannot be installed between two outdrive motors, otherwise the water forced to the side by the propellers will be blocked by the motors and side thrust will be negligible.
3. The thruster must not interfere with drive propeller or rudder.

You can install the thruster off-center and anywhere below the waterline providing the propellers are deep enough and not obstructed to the sides.

The thruster can even be attached to the outdrive unit if desired although specific installation instructions for that configuration are not provided here. Contact Sideshift for installation details.

Heavy-duty angle brackets and extensions posts in 5", 10" and 15" lengths are available from Sideshift to allow installation of the thruster in a variety of scenarios.

PROPELLER DEPTH

The thruster must be installed such that the tips of the propellers are at least five inches (13 cm) below the water surface. Ideally the mounting holes for the thruster should be above the water line, although they can be drilled below the waterline if necessary.



If mounted on the underside of the swim platform, extension pillars can be purchased from Sideshift to attain the necessary depth. Use the following table to guide your pillar length selection:

Platform to Waterline Distance		Extension Length
< 3"	(7.6 cm)	Not required
3" – 8"	(7.6 – 20 cm)	5"
9" – 13"	(23 – 33 cm)	10"
14" – 18"	(35 – 46 cm)	15"

STERN PLACEMENT EXAMPLES

Sideshift thrusters can be placed close to the hull providing there are no obstacles between the thruster propellers and the side of the boat. In this case, a right-angle bracket (Part# EX1-11) is bolted to the transom, and the Sideshift thruster is bolted to the angle-bracket. For example, the placement illustrated in Figure 7 provides good clearance around the thruster, and is a preferred placement method for most boats with inboard motors.

The green area in the illustrations below is intended to show the ideal location in which to place the thruster and propellers. This green area places the propellers at least 5" below the waterline and ideally no part of the thruster protrudes below the bottom of the hull.

The optional bracket has an 80° angle, providing adequate clearance between the thruster propellers and hull. The bracket has a 7" and a 6" flange. The thruster can be mounted on either flange, as required.

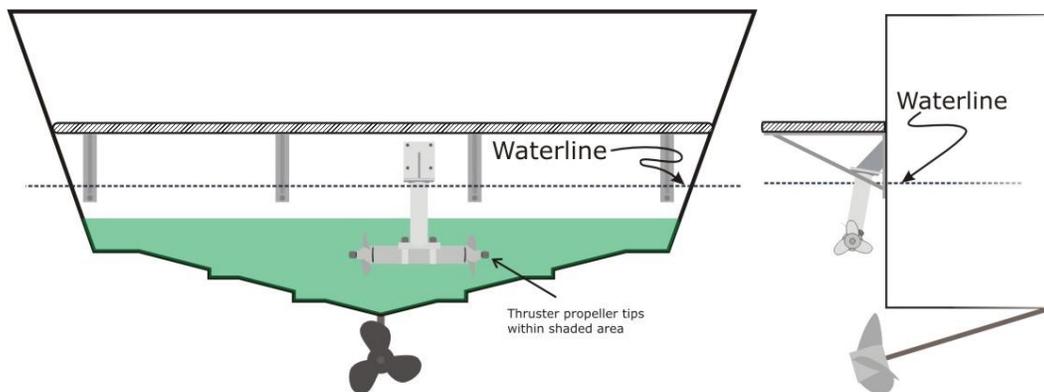


Figure 7: Angle-bracket mounting, inboard engine



The thruster can also be mounted horizontally, eliminating the need for a bracket. See Figure 8. This has the disadvantage of requiring holes drilled below the waterline but may suit some installations where space is limited.

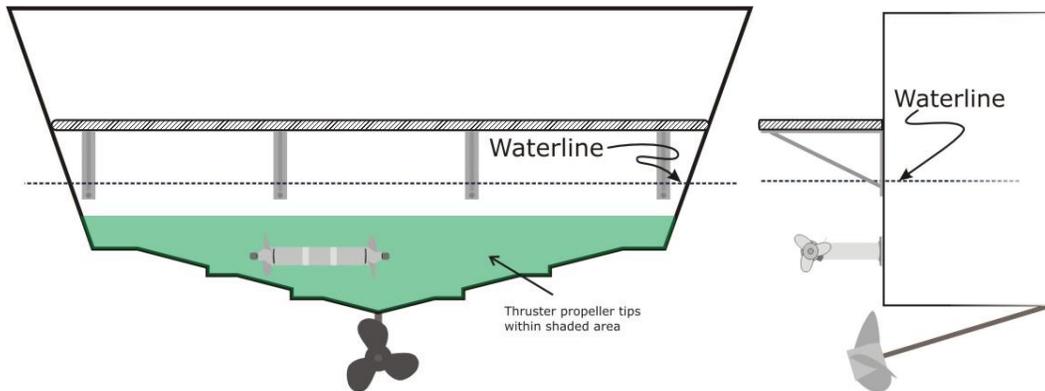


Figure 8: Horizontal mounting, inboard engine

The Sideshift thruster can be mounted vertically from the swim platform to clear outdrive motors as shown in Figure 9. Note that the thruster is off-center and that one propeller is at the outer edge of the hull. This is equally effective as a centered thruster, and since the entire thruster is within the green area, it is an acceptable installation.

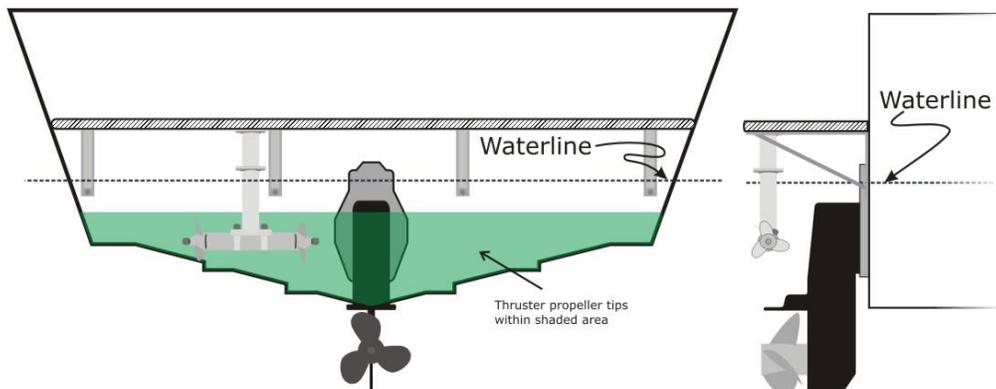


Figure 9: Thruster mounted on swim platform to clear outdrive



Care must be taken to ensure thruster propellers are not obstructed to either side of the thruster. An incorrect installation is shown in Figure 10. The thruster must be placed far enough away from the transom to clear the obstruction, as shown in Figure 11.

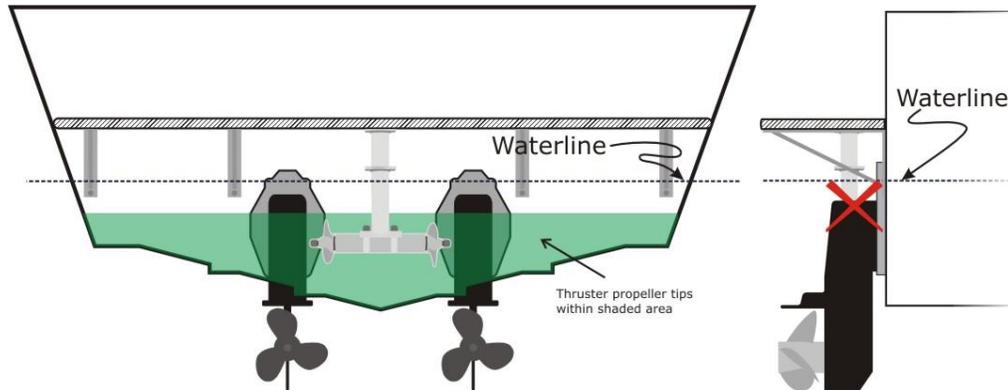


Figure 10: Incorrect: thruster mounted too close to hull, obstructed by outrides

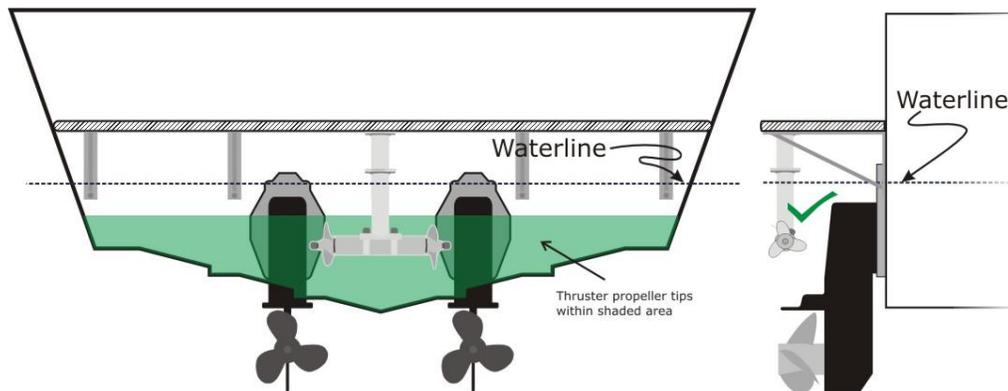


Figure 11: Correct mounting: thruster is far enough from hull to clear outrides



Step-By-Step Instructions: Stern Thruster

STEP 1: DETERMINE WATERLINE



The top of the propeller must be at least 5 inches (12 cm) below the waterline, so determining the actual waterline is a crucial first step to installation.

NOTE: Be sure to determine the shallowest waterline with an empty boat to ensure thruster placement will keep the top of the propeller a minimum of 5" (12 cm) below the waterline in all conditions.

The water stain on the hull is a good indication of waterline over a range of conditions. Use the lowest indication of waterline location if a water mark is visible.

If no water stain is visible, the waterline must be marked while the hull is in the water. With the boat completely unloaded (fuel tanks empty but standard equipment in place), mark the waterline on the transom with a grease pencil.



STEP 2: DETERMINE MOUNTING POSITION

Follow the guidelines in the Stern Placement section on page 30 to determine a mounting position either on the transom or under the swim platform.

If mounting the thruster on the transom, you must consider the mounting hole location to ensure there is no interference on the inside of the hull. You may be able to remount components on the inside of the transom to suit your chosen location or change the mounting location. You can use an extension post if required to help find a suitable mounting position and still keep the top of the propellers 5" (12 cm) below the waterline while avoiding internal obstructions.

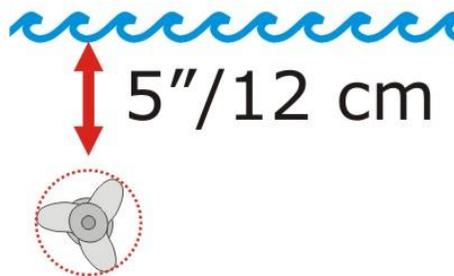


Figure 12: Propeller at least 5" (13 cm) below waterline

STEP 3: DETERMINE CABLE FEED-THROUGH POSITION

Choose a location for the cables and vent tube to pass through the hull that is above the highest waterline and convenient to the thruster. You will need one hole for each cable and one for the vent tube. Choose an entry point on the hull that will not interfere with any objects on the inside of the boat, or consider relocating objects inside the hull.

STEP 4: DRILL HOLES

NOTE: A water-proof angle drill may be required to drill the following holes if the boat is in the water.

WARNING: If in-water installation, use a cordless drill for the following procedure. A corded drill presents an electrocution hazard.

- a. Mark the four mounting holes on the outside of the transom, or on the swim platform, using the backing plate as a template.



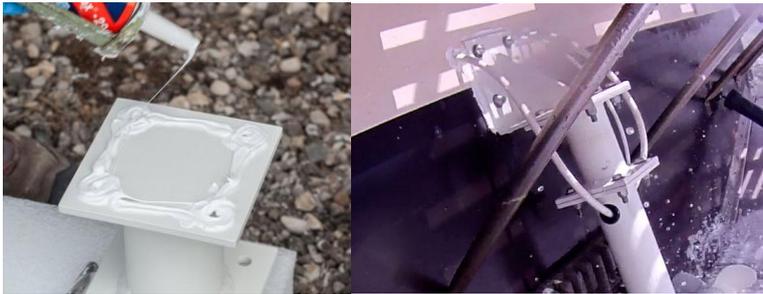
- b. Using a $\frac{5}{16}$ " or 8 mm drill bit, drill pilot holes through the hull at the center of each hole (4 backing plate holes and 3 cable feed-through holes).
- c. Using a $\frac{1}{2}$ " or 13 mm drill bit, enlarge each pilot hole.

STEP 5: ASSEMBLE STERN THRUSTER MOUNTING ASSEMBLY

If extension posts and/or angle brackets are required, bolt them together with stainless steel nuts and bolts.

NOTE: Be sure to use anti-seize compound (supplied with kit) on all nuts so that assembly and future disassembly is easier.

STEP 6: ATTACH THRUSTER BASE



Transom mount

- a. Apply Sikaflex or equivalent sealant in each hole and in an area between the bolt holes on the mounting flange.
- b. Apply Sikaflex or equivalent sealant to the inside of the hull where the backing plate will sit.
- c. Pass mounting bolts through backing plate from the inside of the hull.
- d. Align thruster mounting flange with bolts. Pass each bolt through corresponding flange hole.
- e. Tighten nuts by wrench onto each bolt.





Swim platform mount

- a. Pass mounting bolts through top backing plate on top of swim platform.
- b. Align thruster mounting flange with bolts. Pass each bolt through corresponding flange hole.
- c. Tighten nuts by wrench onto each bolt.

STEP 7: FEED WIRES AND AIR LINE THROUGH HULL



- a. Pass the cables and air line through the hull, one per hole.
- b. Seal holes with Sikaflex or equivalent sealant.

NOTE:

The air line prevents pressure buildup on the seals due to temperature changes. Air line must be positioned so the open end is dry. Tube must not be kinked, crimped or damaged.



INSTALLATION INSTRUCTIONS

– ELECTRICAL

Due to the high current draw by the motors, Sideshift must be supplied with a battery pack dedicated to each thruster.

WARNING: High currents can result in reduced voltage supply to the thruster if improper cable, connectors and/or assembly procedures are used. This can result in poor performance or damage to the thruster motor.

Correct cabling and connection practices are essential to maintaining correct operating voltage. Batteries must be fully charged before use.

In most cases, the cable run from battery to controller is less than 10 feet, in which case 1/0 AWG cable is appropriate. For longer runs, use 2/0 AWG cable. Heavier cable can be used although it provides no performance advantage. If in doubt, increase the cable gauge.

Batteries are usually in a very low part of the boat and subject to moisture or partial submersion and very damp/corrosive conditions, therefore it is important that the connection terminals are properly sealed to the cables using heat shrink tubing (supplied).

Compression terminal sizes match the following applications:

- 1&2 AWG Thruster cables
- 1/0 AWG Battery cable (motor controller end), SS230
- 2/0 AWG Battery cable (motor controller end), all other models

Ideally, the positive cables should be red and the negative cables black.



NOTE: If in doubt of which cable gauge to use, call Sideshift for technical advice.

Instructions:

STEP 1: LOCATE SITE FOR CONTROLLER AND BATTERIES

- a. Find a location inside the boat for the motor controller and batteries as close to the cable entry point as possible. Keep the total cable run including battery to controller and controller to motor as short as possible. The controller must also be accessible so you can easily reset the circuit breaker when required.
- b. Cut cables from motor to length - use sufficient length to reach the motor controller with a little slack in the line to make it easy to install.

NOTE: If the total cable run (battery-to-controller plus controller-to-motor) is longer than 15 feet, use 2/0 instead of 1/0 AWG cable between battery and motor controller.

STEP 2: CUT BATTERY CABLE TO LENGTH

- a. If more than one battery is required, batteries must be arranged and connected in series or parallel as required. See Connecting Batteries in Parallel to Boost CCA on page [14](#) and 24 Volt Batteries on page [15](#) for more details.
- b. Cut two lengths of marine battery cable of suitable length to reach from batteries to controller. Note that one cable may need to be longer than the other to accommodate the location of the battery terminals.

STEP 3: CONNECT BATTERY TO MOTOR CONTROLLER

- a. Fit terminal protectors over each battery lead at the controller end.
- b. Choose a compression terminal to match the cable gauge (typically 1/0 AWG for SS230 thrusters and 2/0 for all other models).



- c. Install compression terminals. See How To Install Compression Terminals on page [41](#) for instructions.
- d. Attach positive cable to the "BATTERY POS" post on the motor controller. Slip battery protector over terminal.
- e. Repeat step b for "BATTERY NEG" cable.

STEP 4: CONNECT BATTERIES

- a. Fit battery protectors and then shrink tube over each battery lead at the battery end.
- b. Install compression terminals. See How To Install Compression Terminals on page [41](#) for instructions.
- c. Attach positive cable (connected to "BATTERY POS" post on motor controller) to the positive post of the battery. Slip battery protector over terminal.
- d. Repeat steps b for "BATTERY NEG" cable.

STEP 5: CONNECT THRUSTER TO MOTOR CONTROLLER

NOTE: Motor power cable polarity is not identified. If thrusters operate in opposite direction from joystick, reverse cable connections on motor controller.

- a. If thruster power cables are too long, cut them to length. Be sure that they are neatly routed, and comfortably reach the motor controller terminals. Leave some slack to make installation easier.



- b. Install compression terminals. See [How To Install Compression Terminals](#) on page [41](#) for instructions.
- c. Connect one cable to "MOTOR 1" and the other to "MOTOR 2".

STEP 6: RESET CIRCUIT BREAKERS

Make sure both circuit breakers on the motor controller are reset by rotating the yellow lever counter-clockwise into the body of the circuit breaker.

How To Install Compression Terminals

STEP 7: STRIP 1" (2.5 CM) OF INSULATION FROM EACH END OF CABLES

NOTE: Take care when stripping insulation to avoid damaging conductor. If some strands are removed the compression terminal will not make a good connection possibly resulting in performance reduction, a fire hazard or the cable pulling out of the compression terminal.

STEP 8: CHOOSE A COMPRESSION TERMINAL TO MATCH THE CABLE GAUGE

STEP 9: LOOSEN COMPRESSION TERMINAL NUT

STEP 10: PASS EXPOSED CONDUCTOR THROUGH NUT

STEP 11: TIGHTEN NUT WITH WRENCH

You will feel the resistance increase a bit as you tighten the nut, then become stiff, at which point the nut is sufficiently tight. Give the terminal a tug to make sure it is solidly attached to the cable.

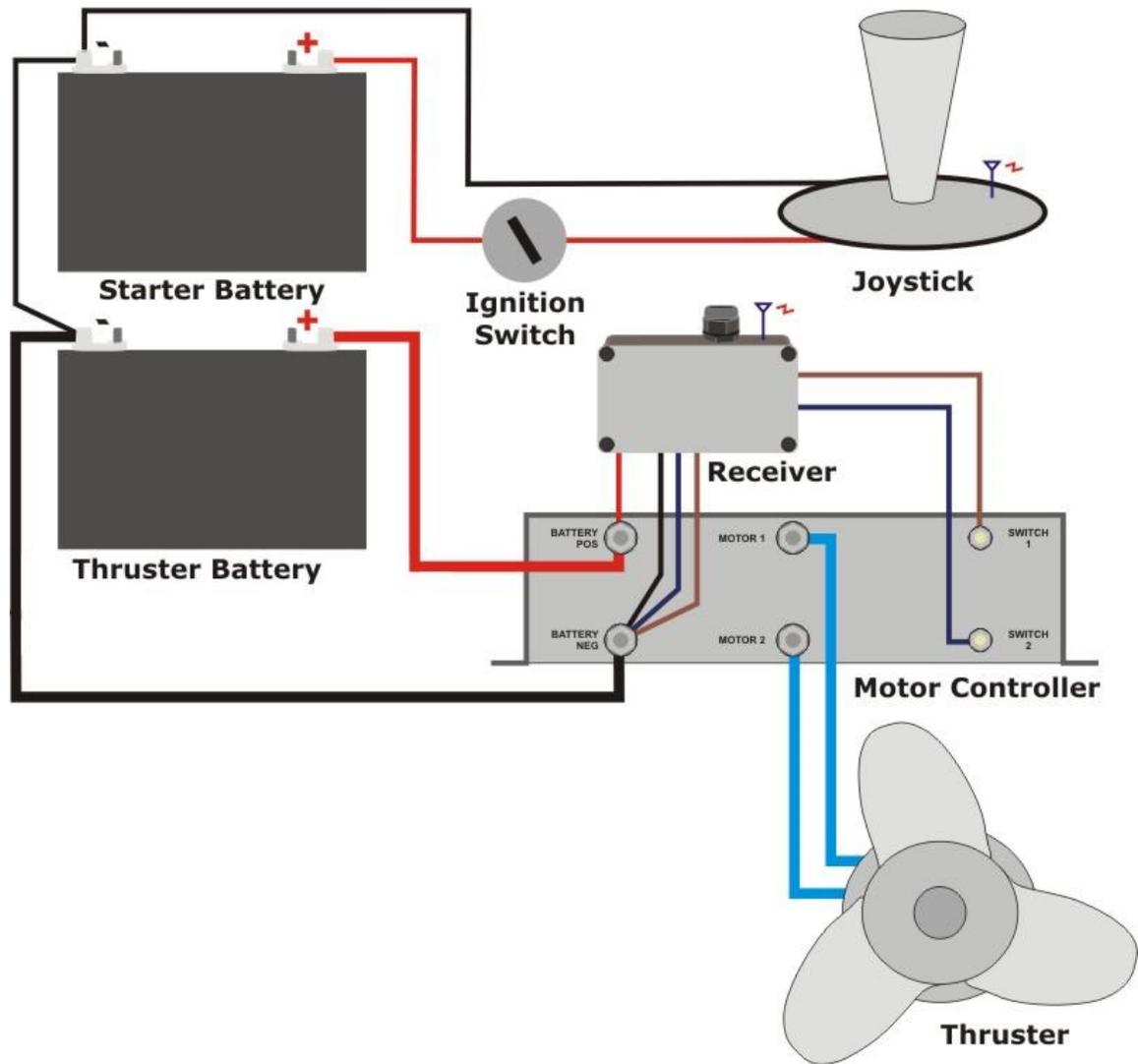
STEP 12: INSTALL HEAT SHRINK TUBE

- a. Slide shrink tube up the cable so that it covers the shaft of the terminal and the insulation of the cable.
- b. Apply even heat to the shrink tube until it makes a solid seal around the cable and terminal.

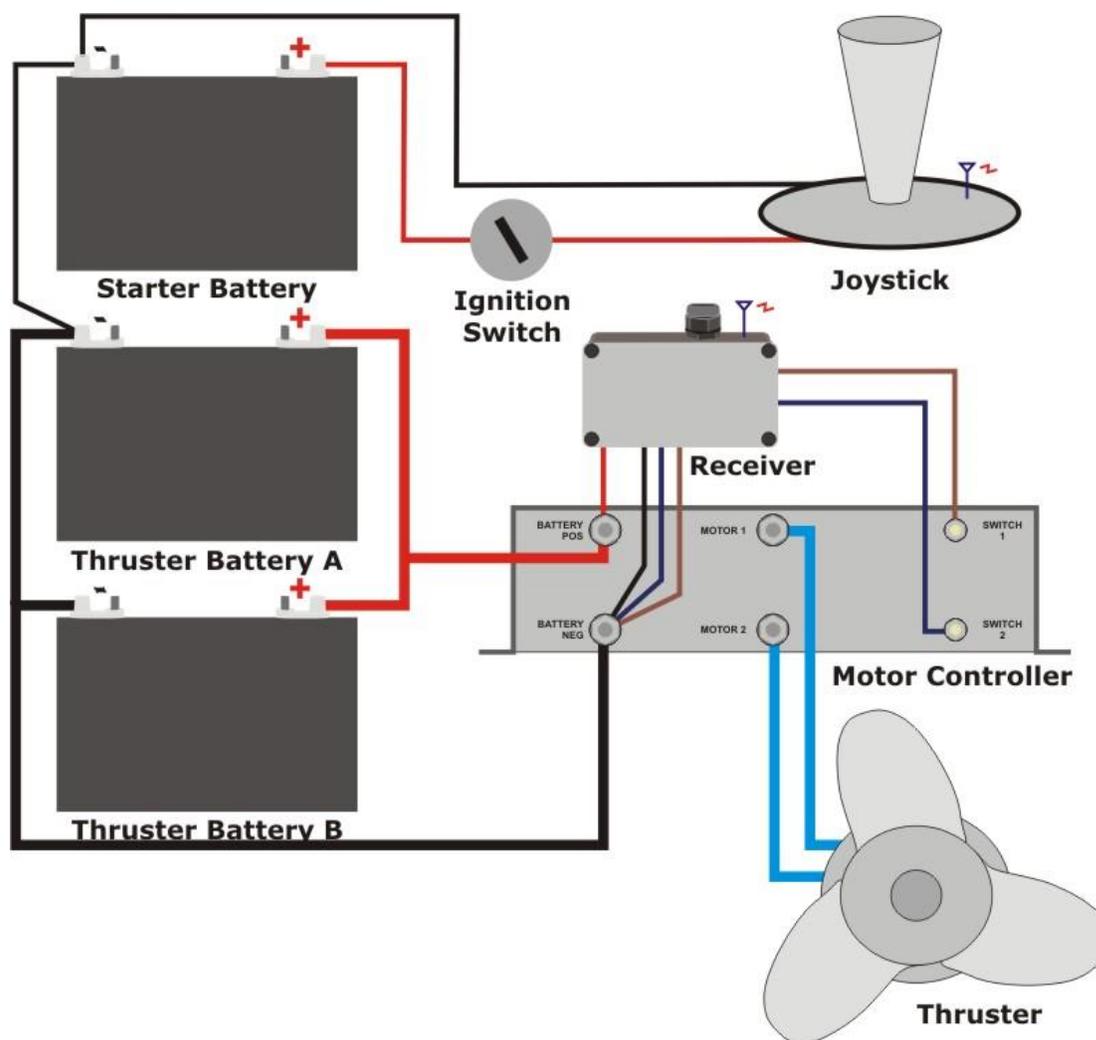


Schematics

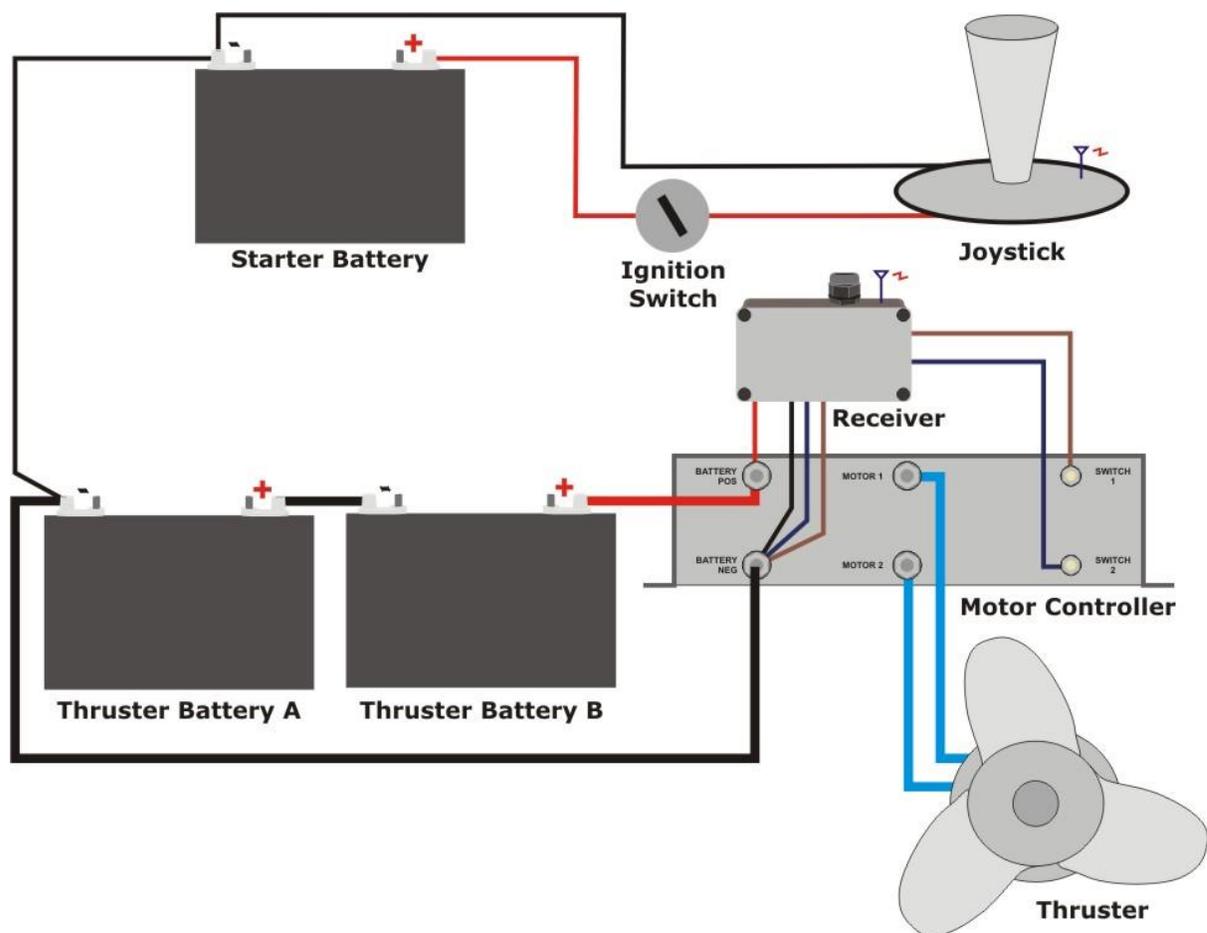
SS230 SERIES THRUSTERS (12 VOLT) SCHEMATIC



340 SERIES THRUSTERS (12 VOLT) SCHEMATIC



350 SERIES THRUSTERS (24 VOLT) SCHEMATIC



INSTALLATION INSTRUCTIONS

– WIRELESS JOYSTICK

Sideshift Wireless Joysticks make installation very straight forward. The joystick itself requires a 12V power source taken from the engine ignition. The wireless receiver is installed next to the motor controller. It requires a 12V power source which can come from the same battery pack supplying the Sideshift thruster.

Instructions

STEP 1: INSTALL JOYSTICK ON CONSOLE



- a.** Locate a position on the console of the boat suitable for the joystick. Check under the selected position on the console to ensure a minimum area of at least 4" diameter and a minimum three inches obstruction-free below the area of the joystick equipment.
- b.** Tape in place the template supplied with the joystick (see Figure 13: Joystick Template (Included with thruster kit) on the area of the console identified in Step 1a above.
- c.** Drill the three holes marked on the template using a 3/16" bit.



- d. Using the same bit as for Step 1c above, drill a hole at the center of the template, marked by the cross-hairs.
- e. Using a 2.5" hole saw and the pilot hole drilled in Step 1d above, drill a hole at the center of the template.

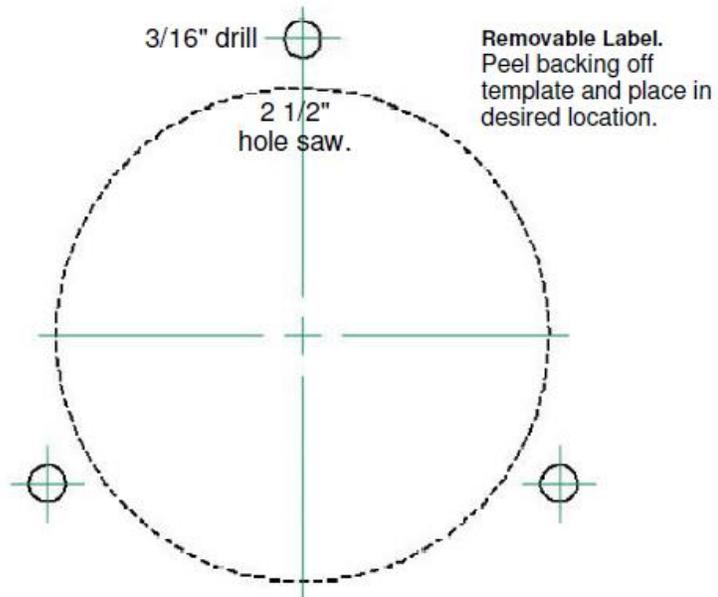


Figure 13: Joystick Template (Included with thruster kit)

STEP 2: CONNECT JOYSTICK (SINGLE OR DUAL JOYSTICK)

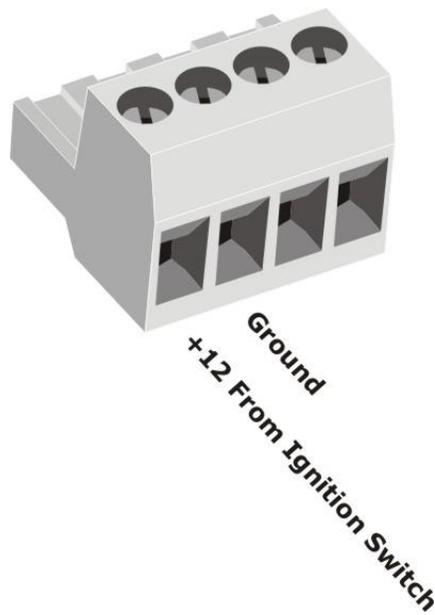


Figure 14: Joystick Terminal Block



- a. Locate power source in console that is only on when ignition is on.
- b. Connect wire from power source located in Step 2a. above to "Ignition Switch Positive" on the joystick terminal block as shown in Figure 14.
- c. Locate a convenient ground connection and wire it to "Ground" on the joystick terminal block as shown in Figure 14.
- d. Plug the connector into the joystick base. Note that it is keyed to fit in only one way.

STEP 3: SECURE JOYSTICK TO CONSOLE

Install the three screws supplied with the joystick from below the console.

STEP 4: CONNECT WIRELESS RECEIVER (SINGLE OR TWO THRUSTER SETUP)

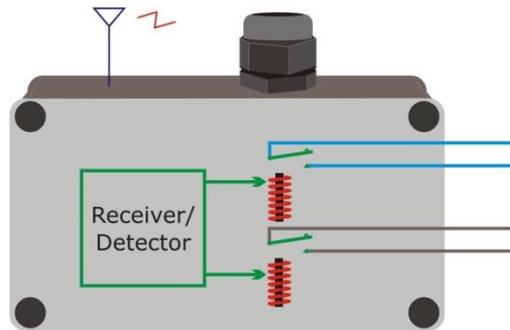


Figure 15: Wireless receiver showing relay outputs

- a. Connect one of the brown wires to "SWITCH 1" on motor controller and the other brown wire to "BATTERY NEG".
- b. Connect one of the blue wires to "SWITCH 2" on motor controller and the other blue wire to "BATTERY NEG".
- c. Connect red wire to "BATTERY POS" post on motor controller.
- d. Attach black wire to "BATTERY NEG" post on motor controller.
- e. Repeat steps a-d on second thruster when installing both bow and stern thruster.



STEP 5: PAIRING AND OPERATING OPTIONAL WIRELESS REMOTE

The wireless remote comes pre-programmed when ordered with the thruster kit. Use the following procedure only if you experience problems with your remote, or when ordering a new remote.

Repeat the following procedure with every remote that you want to pair to the receiver. Up to 7 devices, including key fobs and joysticks, can be paired to the receiver.

- a. Verify that power is supplied to the receiver.
- b. Attach the orange wire located on the wireless receiver to the "BATTERY POS" post on the motor controller.
- c. Press any button on the remote control for at least one second.
- d. Remove orange lead from motor controller post.
- e. To Turn ON Wireless Remote
 - Press and hold the top 2 buttons simultaneously for 4 seconds, then operate by pressing left or right arrows.
- f. To Turn OFF Wireless Remote
 - Press the two bottom buttons simultaneously.
 - The remote has a built in timeout of approximately 4 minutes.

Reset Receiver Pairings

This procedure clears all device pairings from the receiver and is required only if you are experiencing problems with your wireless remote.

Instructions:

STEP 1: ATTACH ORANGE WIRE TO "BATTERY POS"

Using a lead with alligator clips at each end, attach one end to the orange wire and the other end to the "BATTERY POS" post on motor controller.



STEP 2: ACTIVATE WIRELESS REMOTE

On remote, push top left and bottom right buttons simultaneously for at least one second

STEP 3: REMOVE ORANGE LEAD

Remove alligator clip from battery post, then from orange lead

STEP 4: PAIR RECEIVER TO WIRELESS REMOTE

Follow step 5 above "Pairing and Operating Optional Wireless Remote".



MAINTENANCE

Sideshift thrusters are designed for long life, provided proper maintenance procedures are followed.

WARNING: When working near or on the Sideshift thruster, always switch off the thruster at both circuit breakers, located on the motor controller.

Motor Unit

Sideshift thrusters are designed to be very low maintenance. Check for and tighten any loose fasteners periodically. Other maintenance issues are described below.

AIR LINE

Check the condition of the air line regularly. Check line on the outside and inside of the boat to ensure it is not kinked, pinched or damaged in any way that might block it or cause a leak. Make sure the exposed end in the hull is in a dry location.

ANODES

The sacrificial anodes are designed to slowly corrode, thus protecting the motor housing from corrosion.

Replace the anodes **every year**. If anodes are not properly maintained, the motor may corrode and damage could occur.

To **remove** the anodes, use pliers to turn counter-clockwise.

To **install** new anodes, hand tighten until firm, then give them an extra half turn.

ANTIFOULING PAINT

Whenever the boat hull requires antifouling paint, or if the thruster requires it, repaint the Sideshift thruster motor housing and motor mount.

We recommend the Interlux brand of InterProtect 2001E primer and Tri-Lux II antifouling paint.



Battery

Ensure batteries are always fully charged. Unlike other battery technologies such as NiCad, batteries should be lightly cycled. Avoid discharging beyond 75% capacity and even less if possible. Allow battery to cool after charging and before use otherwise battery life will be reduced. To verify charge, measure the terminal voltage of the battery with **no load**, and refer to the chart below to determine the health of your battery:

Voltage	Specific Gravity	Approximate Charge*
>14.4		Over-charging**
>13.38		Charging
12.62	1.265	100%
12.54	1.251	90%
12.45	1.236	80%
12.4	1.225	75% ***
12.27	1.206	60%
12.18	1.19	50%
11.97	1.155	25%
11.76	1.12	0%

Table 3: Terminal voltage vs. battery capacity

Note *	It can take 2 hours after charging for the terminal voltage to properly reflect the charge level.
Note **	Over-charging can damage the battery and cause hydrogen gas to form which is an explosion hazard and can lead to serious injury and fire.
Note ***	Avoid discharging beyond 75% to avoid premature battery failure.



Replacement Parts

The following replacement parts are available from your dealer or directly from Sideshift (website or phone order). See the Sideshift website for the latest accessories and current prices.

ANODE KIT PART NUMBERS



Sacrificial anodes prevent unit corrosion (anodes corrode instead of motor). The small thread size fits the motor and the large thread size fits the propeller.

Packages of three are for the single prop model and four are for dual prop models.

Order the anode kit to match the model of thruster. See Table 4 for correct kit.

Sideshift Model	Part Number
230 series	AK-S-1
340 series	AK-S-2
350	AK-S-2

Table 4: Thruster vs. anode kit

MOTORS



Replacement motors can be ordered as follows:

SS/SF Thruster	Model Number
230 replacement motor kit	MA230
240 replacement motor kit	MA240
250 replacement motor kit	MA250

Table 5: Motor replacement kits



Motors can also be rebuilt. This is practical as long as there is no internal water damage. Contact Sideshift for more information on motor rebuilding services.

PROPELLER KIT

Propeller kits include one single propeller, nut, washer and shear pin. Order part number PROP KIT.

MOTOR CONTROLLER

Due to different current handling requirements, the motor controller must be matched to the thruster model.

Motors can be ordered as follows:

Thruster Model	Controller Part Number
230 series	MC230
240 series	MC340
250 series	MC350

Table 6: Thruster vs. Controller

JOYSTICKS AND KEY FOB

Replacement or additional wireless joysticks are available. Wired joysticks have been discontinued. If you have a legacy wired joystick that requires replacement, please purchase a wireless receiver and follow the installation instructions in this manual (Installation Instructions – Wireless Joystick on page [45](#)). Choose single or dual joysticks to match single or dual thruster installation. Key fobs suit all types of installations.

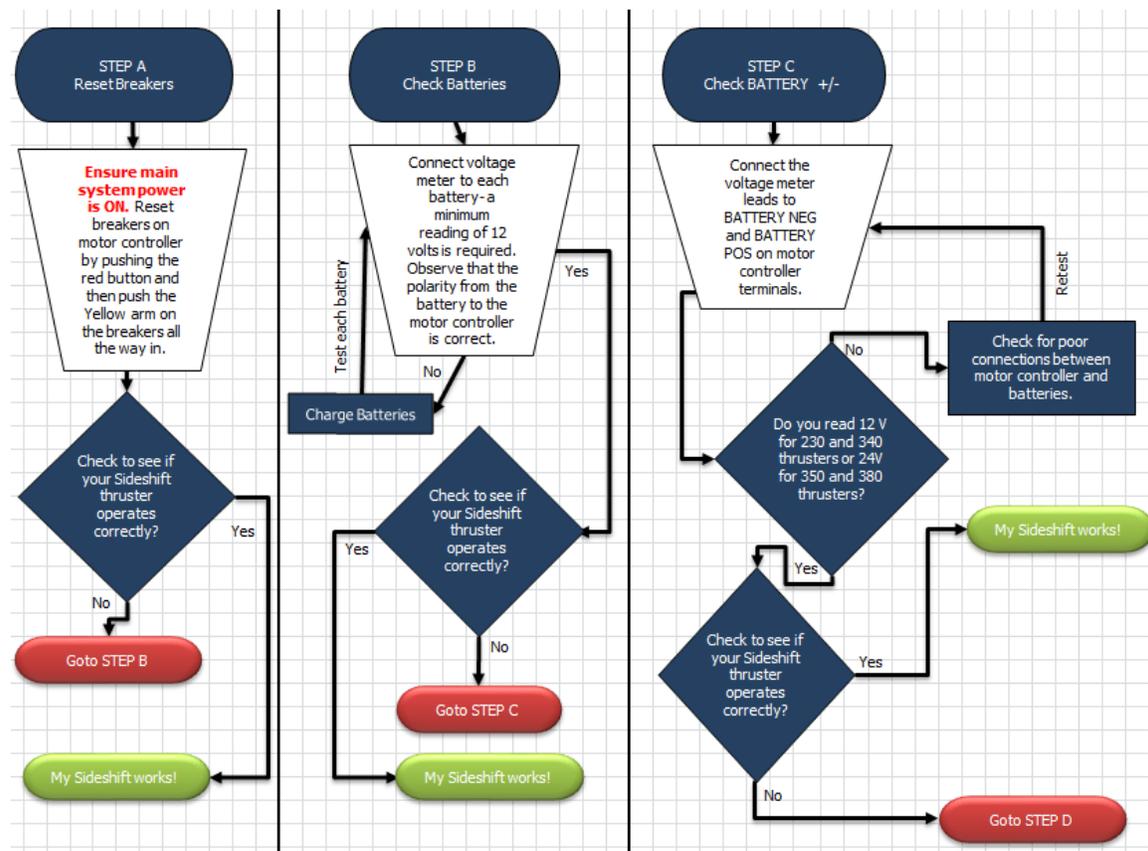
Item	Model Number
Single Joystick	JO1-2
Dual Joystick	JO1-1
Wireless Control with Key Fob	JO1-3

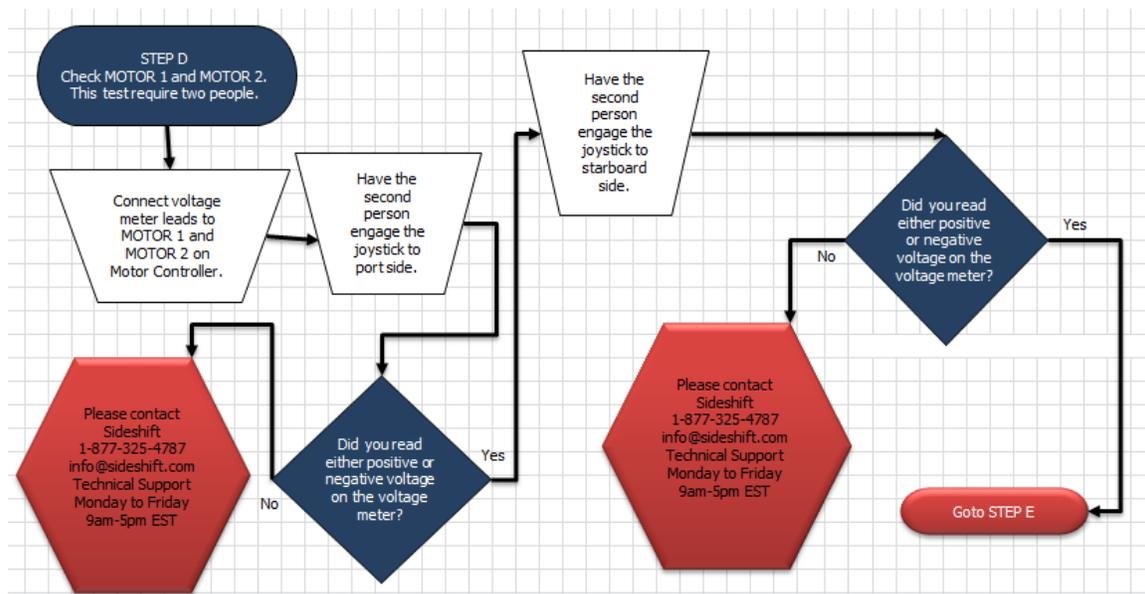
Table 7: Joysticks and key fobs

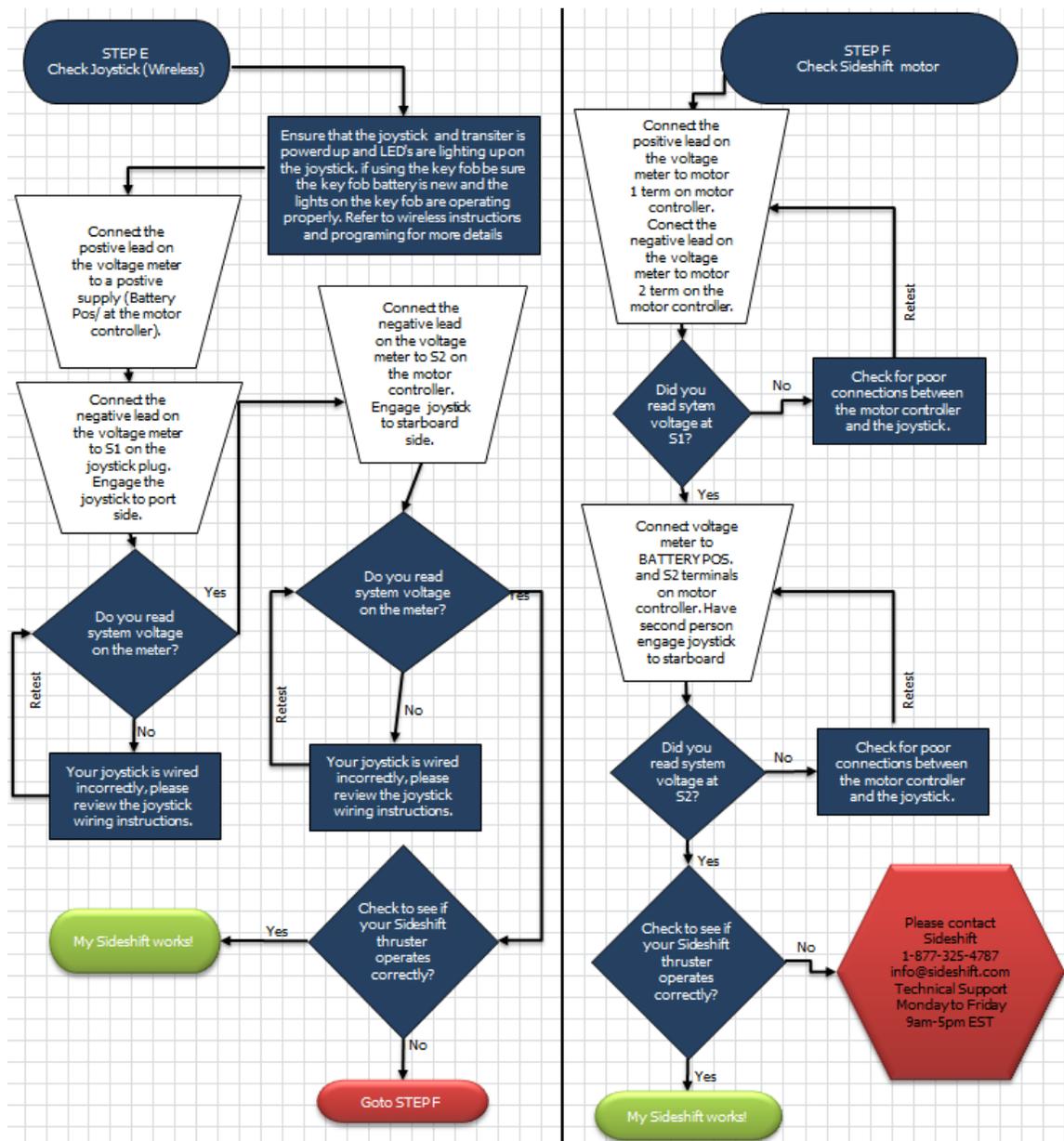


TROUBLESHOOTING

Use the following charts to troubleshoot problems with Sideshift thrusters.







WARRANTY

2 Year Warranty

Register your warranty at <https://sideshift.com/register-warranty/>

All Sideshift Inc. products are warranted to be free from defects due to faulty workmanship or defective materials for a period of two years. Products failing within the warranty period should be returned to Sideshift assembled and complete with a copy of the original invoice. Return requests must be emailed, mailed or faxed to Sideshift. The request should include an itemized list of material, stating the reason for the requested return. Upon approval Sideshift will assign a Return Merchandise Authorization Number which must be placed on the return shipping container. Delivery of returned merchandise will be refused and credit will not be issued without written authorization and shipping instructions from Sideshift.

Sideshift Inc. will not be responsible for accidental damage or expense caused by the following conditions:

- Damage due to improper installation
- Improper wire size or low voltage conditions
- Burn-out due to overloading motor or related damage
- Tampering with or altering the motor before, during or after installation
- Damage due to collision of any kind
- Damage due to entanglement of foreign objects such as fishing line and netting material
- Warranty does not cover paint damage, dents, nicks and normal wear and tear of the product following delivery and installation.



SPECIFICATIONS

Bow Thrusters

Parameter	SS230	SS340	SS350
Power (HP)	2.5	5.0	7.5
Voltage (V)	12	12	24
Start Current (A)	300	550	400
Length (in)	27.5	27.5	27.5
Propeller (type)	8"	8"	8"
recommended boat size (ft.)	20-35	30-45	40-60

Stern Thrusters

Parameter	ST340	ST350
Power (HP)	5.0	7.5
Voltage (V)	12	24
Start Current (A)	550	400
Length (in)	16.75	16.75
Propeller	8"	8"
Recommended boat size (ft.)	20-45	40-60

Wireless Receiver

Parameter	Value
Supply voltage	12 – 24 V

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