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2 Package Contents

Package contents: items may appear slightly different than shown.



Display / keypad



Thru-hull paddlewheel sensor



CPU



Paddlewheel install kit with instructions



Throttle motor assembly with control cable



Power cable



Throttle motor power cable



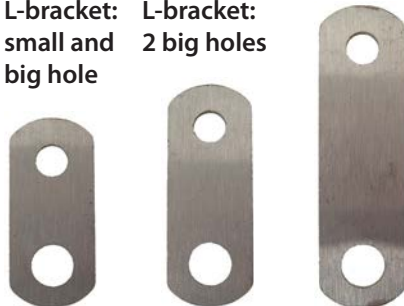
Digital [electronic] speedometer cable (optional)



L-bracket: small and big hole
L-bracket: 2 big holes



Cable guide



Flat brackets [short, medium, long] with small and big holes



1/4-20 slotted bolt and nylon lock nut x2



10-32 K-lock nut x4



10-32 bolt and nylon lock nut



1/4" washer x6



#6 wood screw x2



4" zip tie (cable tie) x2



8" mounted head zip tie (cable tie) x2



8" zip tie (cable tie) x6



12" zip tie (cable tie) x2

4 Overview

Congratulations on your purchase of the Ridesteady speed control system. Your system was designed with state-of-the-art technology to provide high performing, easy-to-use operation.

Closed loop control design

The Ridesteady speed control system is a true “closed loop” control system. The only input needed from the driver is the desired set speed. There is no need to set the wind speed, weight of the crew, weight of the rider, etc.

Water-based speed control

The Ridesteady speed control system controls the boat speed relative to the water in which it travels. The driver does not need to estimate the water speed due to wind or underlying currents and attempt to compensate in each direction of travel.

Water temperature can also be measured; a particularly useful feature in the off-season.

Ease of use

The boat driver is the number one consideration in the design process of the Ridesteady speed control system. From the display interface layout to the menu structure to the control engagement, making the boat driver’s life simpler is paramount.

Power efficient

Advanced technology is designed into the Ridesteady speed control system to drive the throttle motor. This results in greatly reduced power consumption which lowers the burden on your battery and alternator. More power capacity remains for your stereo and other electrical equipment!

Synergetic throttle connection

The Ridesteady speed control system uses a unique method of connecting to your boat’s existing throttle cable. This design reduces potential obstructions and interference caused by control cable movement during operation.

Throttle reduction technology

Throttle reduction technology prevents the speed control from allowing the boat to go faster than the amount of throttle the driver provides for a safe operating environment.

Installation process

Installing the Ridesteady speed control system onto your boat involves steps such as: connecting the CPU to your boat’s switched 12V power; installing the Ridesteady control cable alongside your existing throttle cable; installing the paddlewheel speed sensor into the boat hull through a 2” hole.

Detailed step-by-step instructions are included in this manual to allow the mechanically-inclined boat owner to install the Ridesteady speed control system successfully. However, if you are not comfortable with performing procedures such as the ones listed above, you should seek the service of a qualified boat technician to install the Ridesteady speed control system.

Read through this manual in its entirety before beginning installation.

Engine compatibility

Most “direct-drive” (inboard) “V-drive”, and “I/O” boat-types are compatible with the Ridesteady speed control. Your engine must possess a very common “pull-type” mechanical throttle which pulls the throttle to open / accelerate. Your engine must also have a common idle-return spring which pulls the throttle arm to return to idle.

This installation manual was written to cover a wide range of different boat and engine configurations. However, it is difficult to cover every possible boat and engine combination in detail. Please visit www.hydrophase.com for additional boat / engine installations and support.

We’re here for you!

If you have any questions or concerns regarding the installation or use of your Ridesteady speed control system, just send us an e-mail or give us a call. We’re not satisfied until you’re out on the water rippin’ it up!

e-mail: support@hydrophase.com

phone: 512-524-8686

Installation procedures

- 1) Connect and mount throttle motor housing
- 2) Install control cable
- 3) Mount display
- 4) Connect optional speedometer cable
- 5) Connect optional existing paddlewheel cable
- 6) Connect power and mount CPU
- 7) Install paddlewheel
- 8) Connect CPU / power test

1) **Connect and mount the throttle motor housing**

Connect throttle motor power cable

1. Insert the throttle motor power cable through the zip tie loop on the housing. Connect the throttle motor power cable to the throttle motor by mating the two connectors. **IMPORTANT:** Make sure the connector is fully latched to avoid coming loose with vibration (see figure 5-1).
2. Tighten the zip tie around throttle motor power cable to create cable strain relief (see figure 5-1).

Mount throttle motor housing

Find a suitable mounting location for the throttle motor housing by locating an exhaust or cooling hose which will allow the control cable to make a smooth bend when connected to the throttle arm.

Frequently a good mounting location is the large exhaust hose connected to the riser manifold on the side of the engine.

1. The throttle motor housing should be positioned such that the control cable makes a smooth bend to connect to the engine throttle arm (see figure 5-2).
2. Loosen two of the existing exhaust hose clamps and slide each side of the throttle motor housing mounting tab through one of the clamps (see figure 5-3).
3. Tighten the hose clamps enough that the throttle motor housing will not move as the boat travels through choppy water. The mounting tabs may bend slightly under the hose clamps; this is normal (see figure 5-3).

2) **Install the control cable**

The following sets of pages (pg. 6-7, 8-9, 10-11) describe the procedures to install the control cable in different engine configurations. Your engine configuration may look slightly different than the pictures shown. You can reference these procedures and the alternative control cable installation pictures in the appendix to install the control cable on most boats.

- Pull off the white protective tubing from end of control cable prior to installation.
- Some pictures will contain a white background to better illustrate the procedures being described.
- You will not use all the hardware included as different parts are provided for different engine configurations.
- All parts should be checked periodically to ensure proper operation (i.e. check all fasteners for retention).
- Visit www.hydrophase.com to download this instruction manual in PDF form with full color pictures.

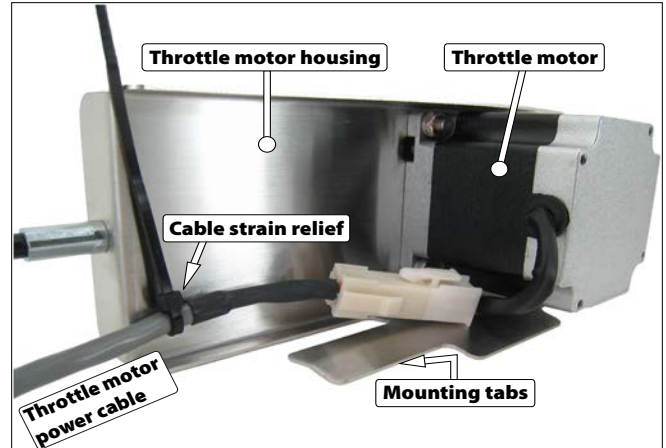


Figure 5-1: Throttle motor housing (back) showing throttle motor power cable connection and strain relief. Actual connectors may be different than shown.

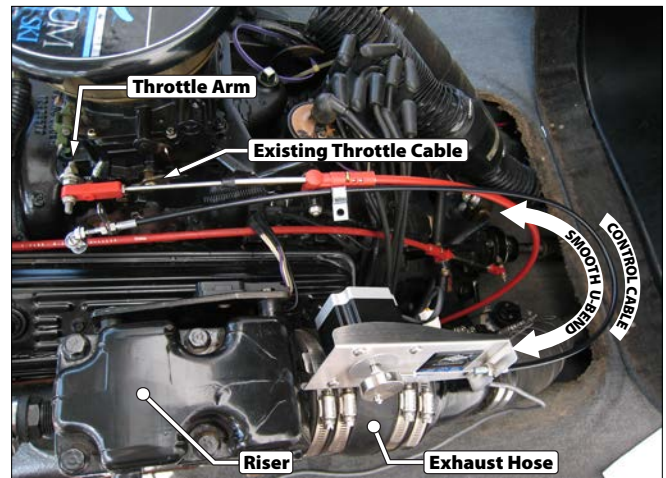


Figure 5-2: Throttle motor housing mounted on exhaust hose, showing control cable temporarily placed near existing throttle cable with end near throttle arm (note smooth U-bend in cable)

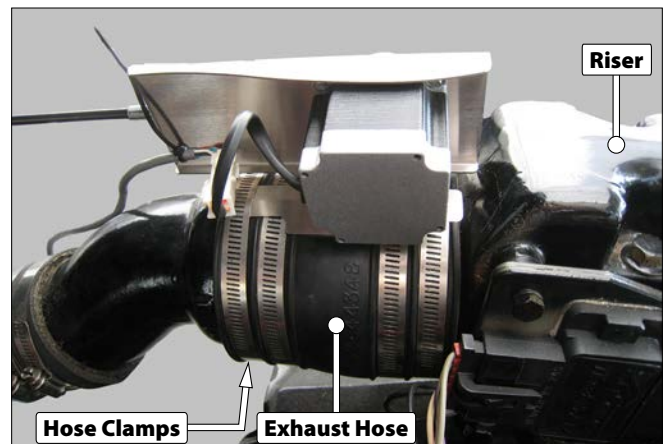
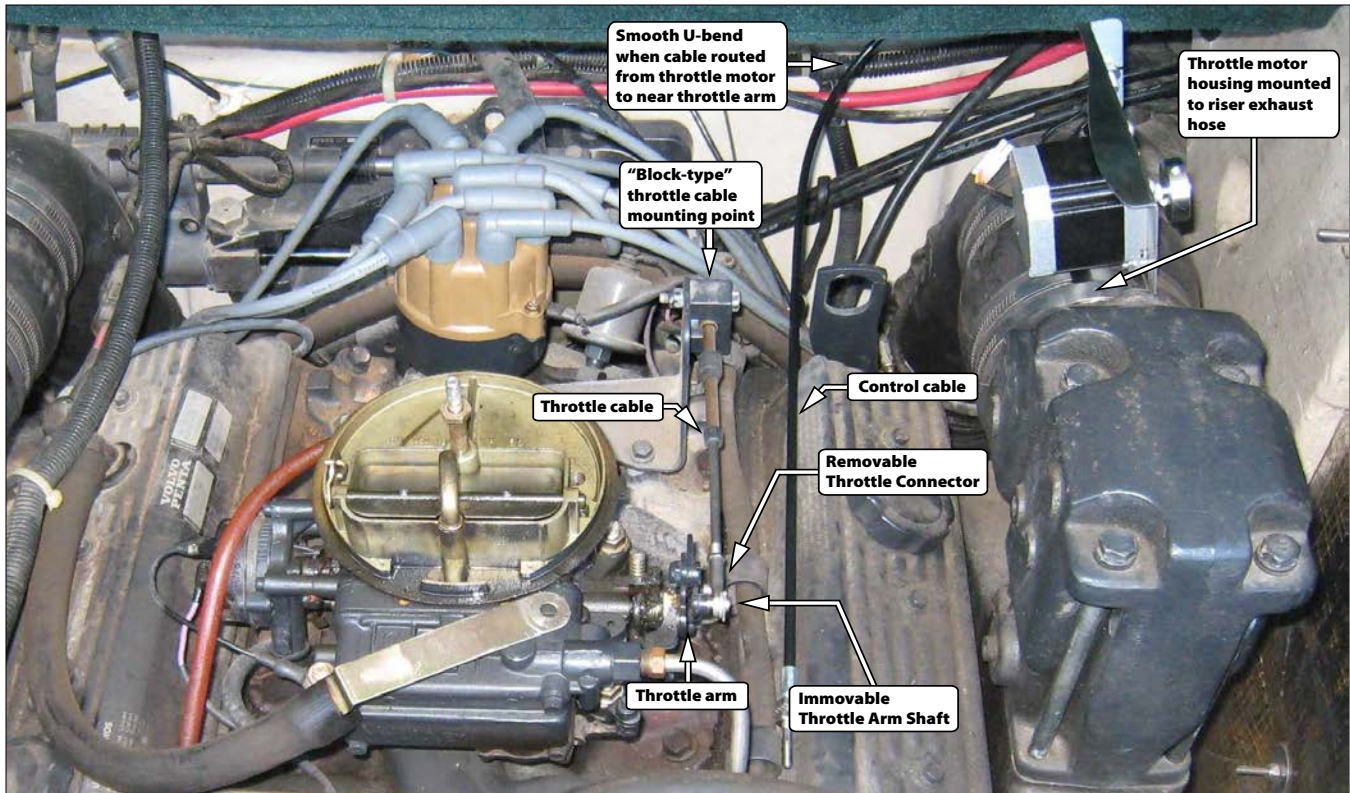


Figure 5-3: Throttle motor housing mounted on exhaust hose. Mounting tabs secured by exhaust hose clamps.

6 Control Cable Install

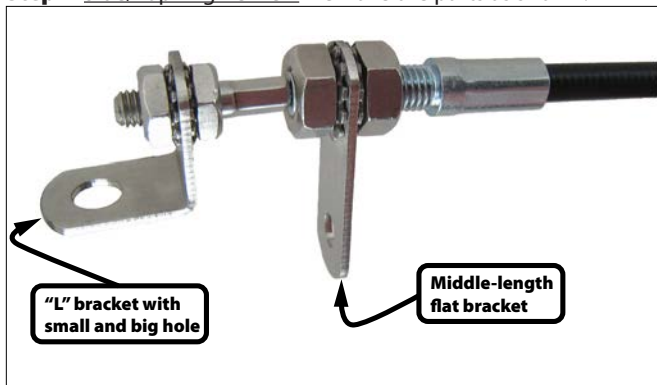
Engines with removable throttle connectors (eye connector), immovable throttle arm shaft, and 'block-type' throttle cable mounting point (common on Volvo-Penta engines)



Step 1 Front/Top Engine View Remove engine cover and spark arrestor if necessary to access the throttle cable / engine connection. Notice the throttle motor housing is mounted on the riser exhaust hose and the control cable has been determined to have a smooth U-bend when placed near the existing throttle cable.



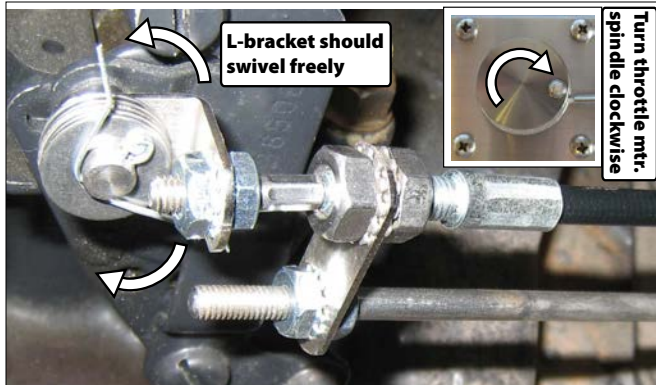
Step 2 Side/Top Engine View Remove the parts as shown.



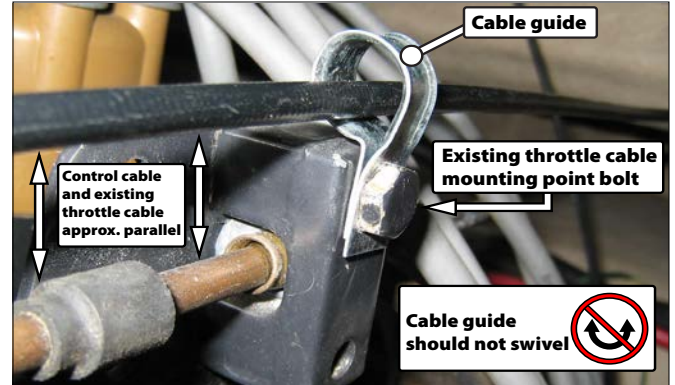
Step 3 Assemble the control cable connection as shown using the parts supplied. Hand tighten. Try using the middle-length flat bracket first; the other two flat brackets may also be tried for better alignment.



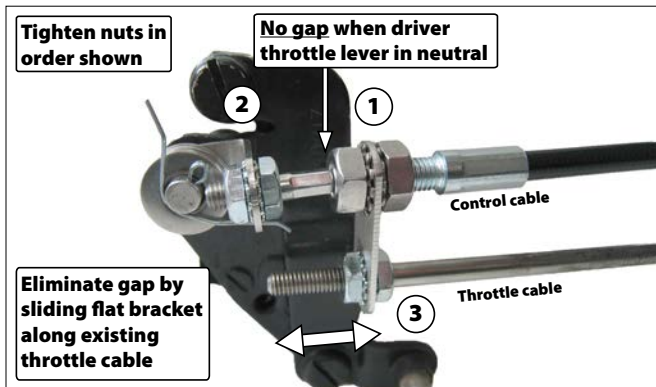
Step 4 Install the control cable onto the existing throttle cable using two K-lock nuts as shown. Place the L-bracket onto the throttle arm shaft as shown. **NOTE:** Moving the driver throttle lever about half way down may help with clearance.



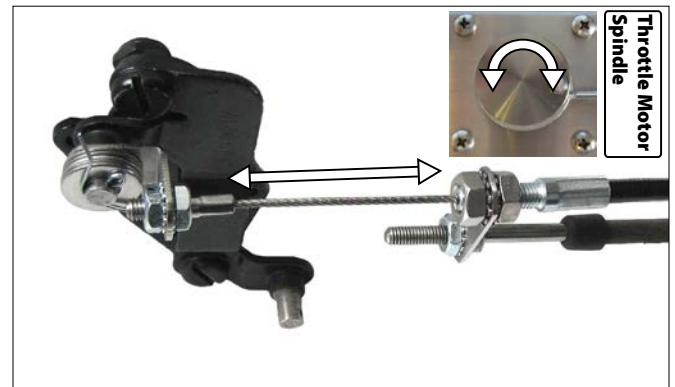
Step 5 Slowly return driver throttle lever to 'neutral' position (if previously moved). Turn throttle motor spindle clockwise to wind up any slack in the cable. Add washers (typically 4 to 5) to throttle arm shaft as shown and replace with new cotter pin (not included). L-shaped bracket should be snug, but able to swivel up and down freely.



Step 6 Remove existing throttle cable mounting point bolt and nut and install cable guide as shown. Replace bolt and nut. Cable guide should be positioned so that the control cable is roughly parallel with the existing throttle cable. The cable guide should be secured tightly enough that it will not move as the control cable passes thru it.



Step 7 Tighten the four nuts on the control cable with pliers (nut pairs 1 & 2 in picture). Slide the flat bracket up and down the existing throttle cable as necessary to eliminate any gap as shown. Tighten the remaining two nuts (nut pair 3 in picture) on the existing throttle cable with pliers. A white background is used for clarity.



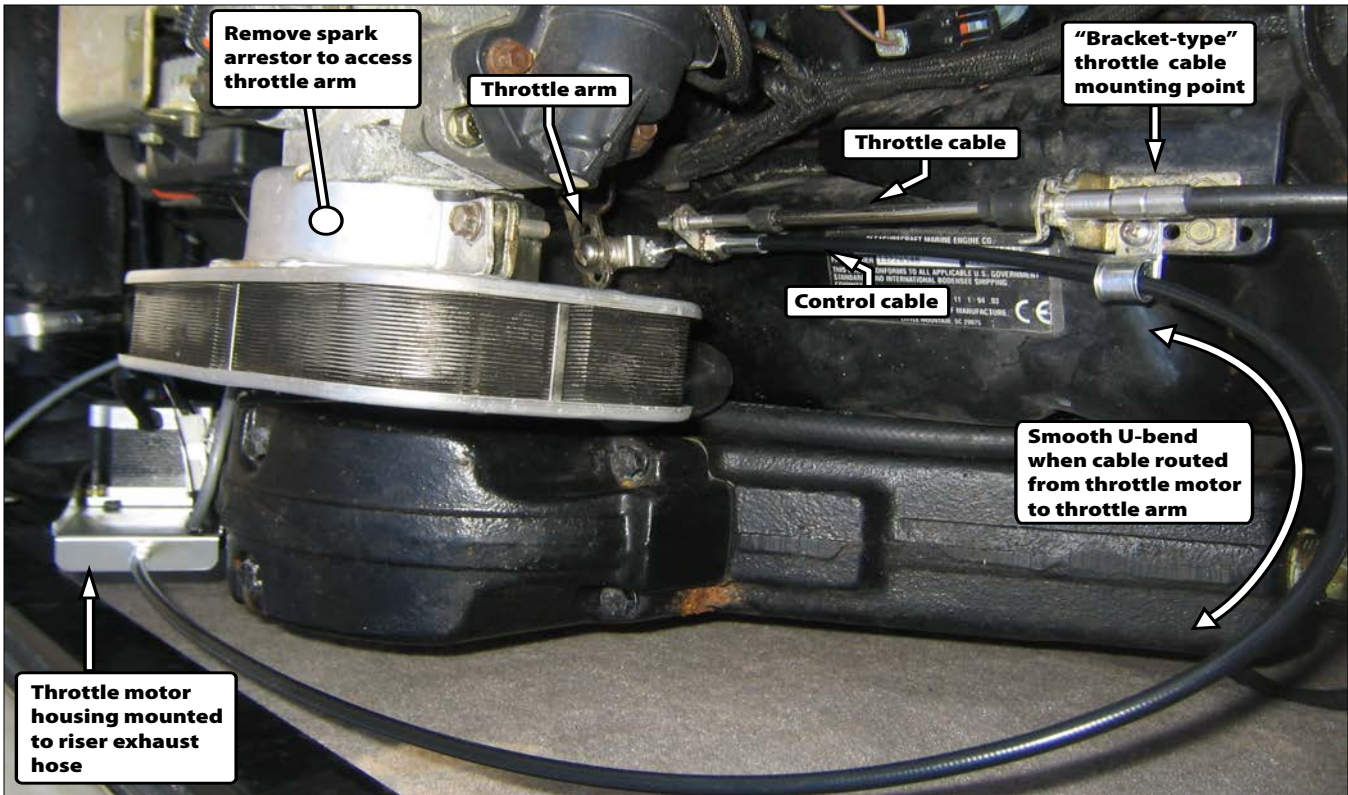
Step 8 Move the driver throttle lever to full open and then back to neutral slowly to confirm the control cable moves freely without interference. Then, with the driver throttle lever half way down, rotate the throttle motor spindle and confirm the throttle arm moves back and forth freely as shown. A white background is used for clarity.



Step 9 Finished control cable installation should look similar to the picture above. The control cable should be approximately parallel to the existing throttle cable from the cable guide to the throttle arm. To align, loosen throttle / control cable nuts, align cable, then re-tighten nuts. Replace the spark arrestor and/or engine cover if previously removed. Make sure control cable continues to be clear of any obstructions.

8 Control Cable Install

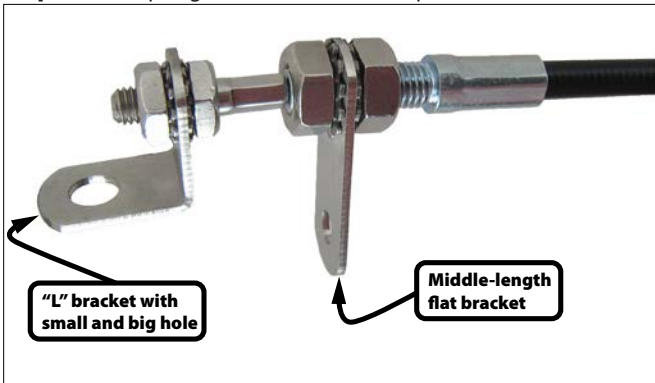
Engines with removable throttle connector, removable throttle arm shaft and "bracket-type" throttle cable mounting point (some inboards / V-drives - common on PCM engines)



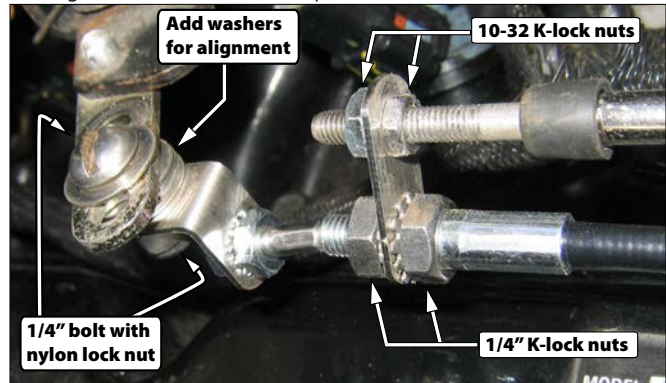
Step 1 Side/Top Engine View Remove engine cover and spark arrestor if necessary to access the throttle cable / engine connection. Notice the throttle motor housing is mounted on the riser exhaust hose and the control cable has been determined to have a smooth U-bend when placed near the existing throttle cable. NOTE: This shows the completed control cable install.



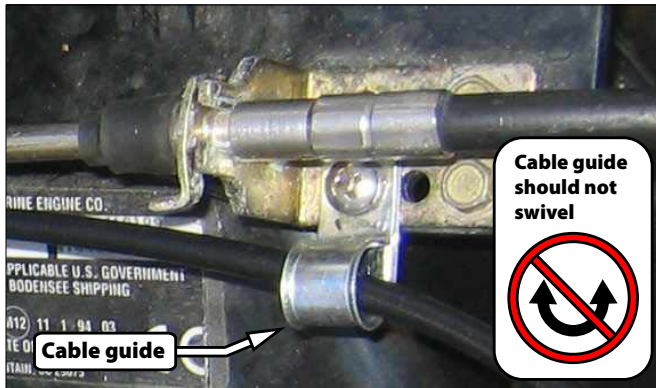
Step 2 Side/Top Engine View Remove the quick release connector from existing throttle cable. Remove quick release ball from throttle arm.



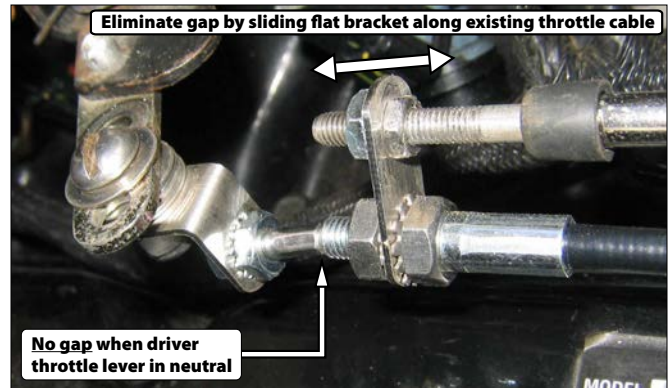
Step 3 Assemble the control cable connection as shown using the parts supplied. Hand tighten. Try using the middle-length flat bracket first; the other two flat brackets may also be tried for better alignment.



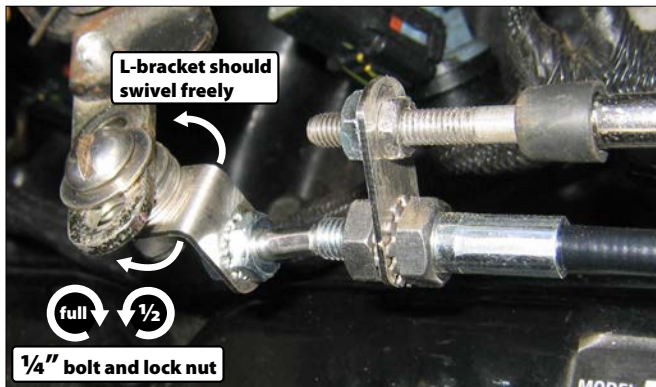
Step 4 Install the control cable onto the existing throttle cable and throttle arm as shown using the parts supplied. Add washers as needed between throttle arm and L-bracket for better cable alignment. Hand tighten. NOTE: In some cases, the existing quick release connector may be used instead of the L-bracket attached to the throttle arm.



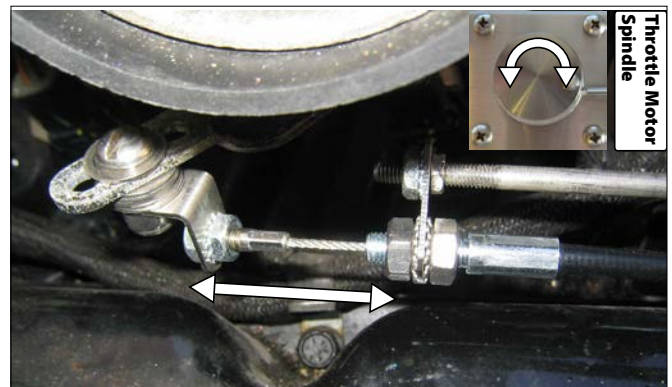
Step 5 Install cable guide onto existing throttle cable bracket as shown using the 10-32 x 1/2" bolt and nylon lock nut provided. Tighten with pliers and screwdriver enough that the cable guide will not move as the cable passes through it.



Step 6 When the driver throttle lever is in the neutral position, there should be no gap in the area indicated. Slide the flat bracket up and down the existing throttle cable as necessary to eliminate any gap as shown. NOTE: In this picture, the driver throttle lever is in the wide open position only to make the throttle arm visible for photography.



Step 7 Tighten all nuts with pliers. The 1/4" bolt and nylon lock nut used to attach the L-bracket to the throttle arm should be tightened fully with pliers and screwdriver and then un-tightened one half turn to allow L-bracket to swivel freely.



Step 8 Move the driver throttle lever to full open and back to neutral to confirm the control cable moves freely without interference. Then, with the driver throttle lever half way down, rotate the throttle motor spindle and confirm the throttle arm moves back and forth freely as shown.

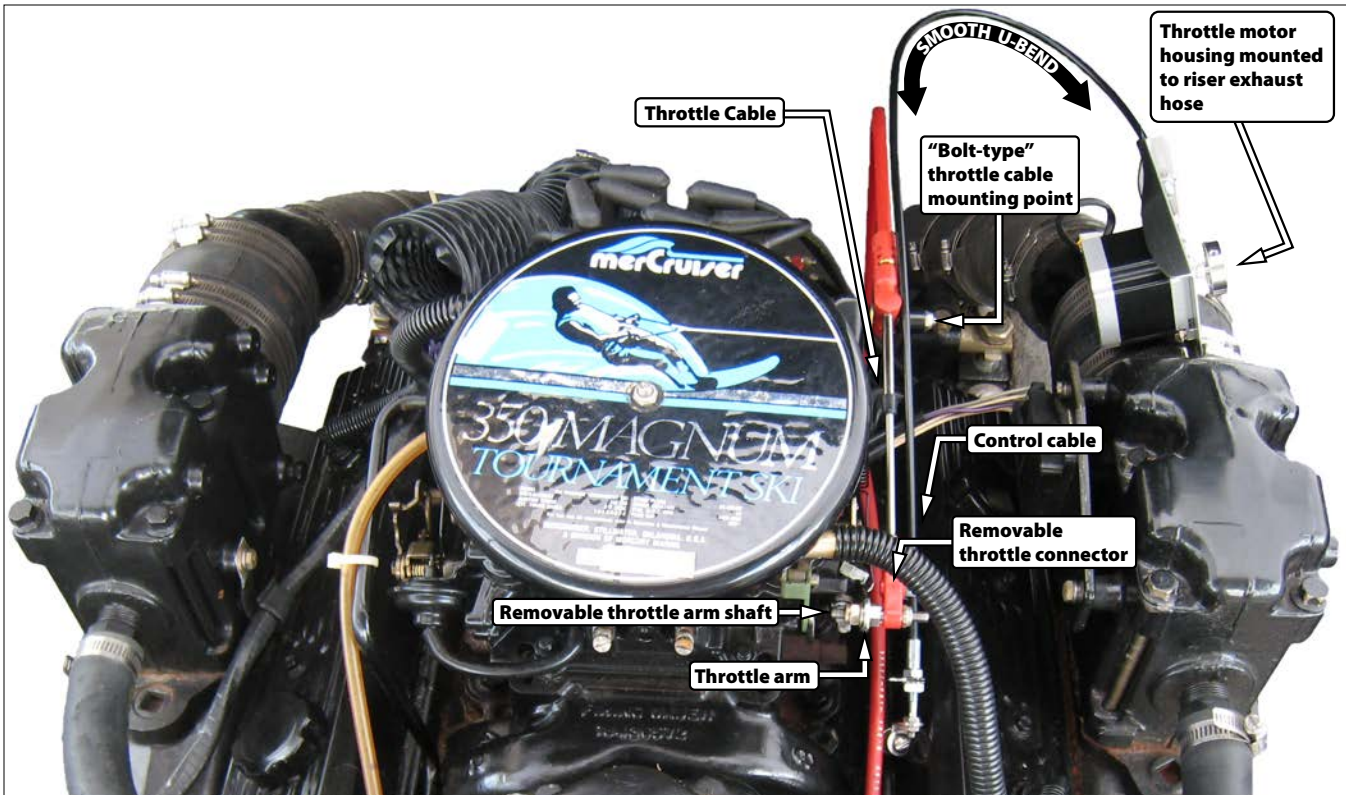


Step 9 Finished control cable installation should look similar to the picture above. The control cable should be approximately parallel to the existing throttle cable from the cable guide to the throttle arm. To align, loosen throttle / control cable nuts, align cable, then re-tighten nuts. Replace the spark arrestor and/or engine cover if previously removed. Make sure control cable continues to be clear of any obstructions. NOTE: The driver throttle lever is in the wide open (full down) position for photo purposes.

10

Control Cable Install

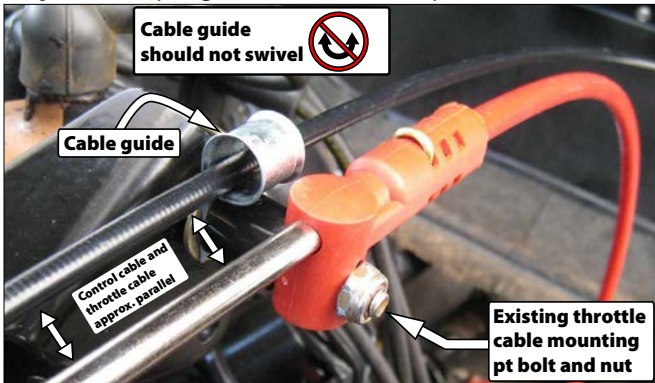
Engines with removable throttle connector, removable throttle arm shaft and "bolt-type" throttle cable mounting point (some inboards / V-drives / I/Os)



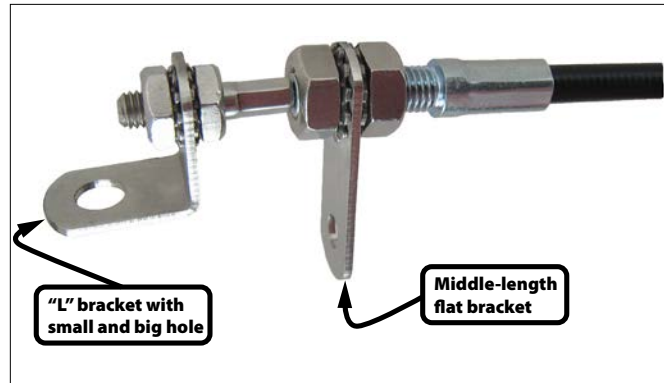
Step 1 Front/Top Engine View Remove engine cover and spark arrestor if necessary to access the throttle cable / engine connection. Notice the throttle motor housing is mounted on the riser exhaust hose and the control cable has been determined to have a smooth U-bend when placed near the existing throttle cable. A white background is used for clarity.



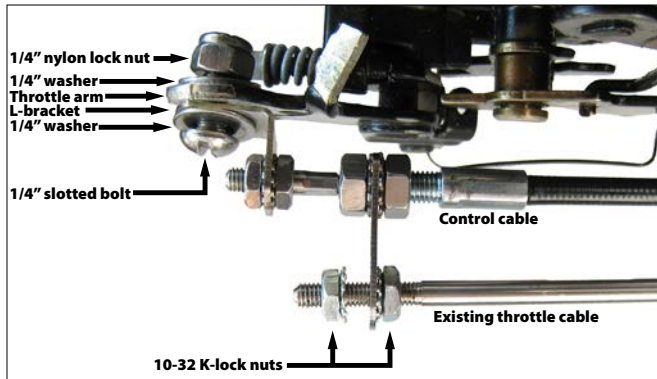
Step 2 Side/Top Engine View Remove the parts as shown.



Step 3 Remove throttle cable mounting point lock nut. Install cable guide as shown. Switch position of spacer and throttle cable and reinstall as shown. Cable guide should be positioned so that the control cable is roughly parallel with the existing throttle cable. The cable guide should be secured tightly enough that it will not move as the control cable passes thru it.



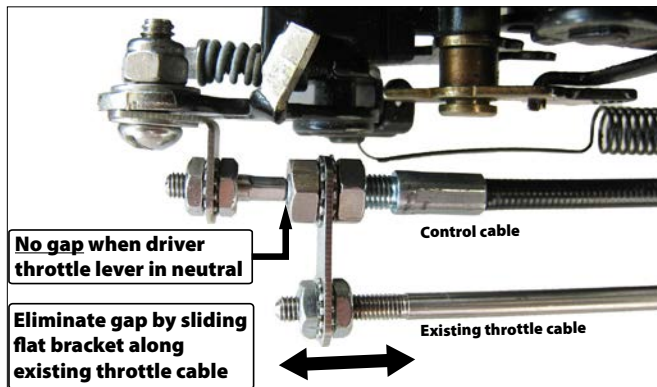
Step 4 Assemble the control cable connection as shown using the parts supplied. Hand tighten. Try using the middle-length flat bracket first; the other two flat brackets may also be tried for better alignment.



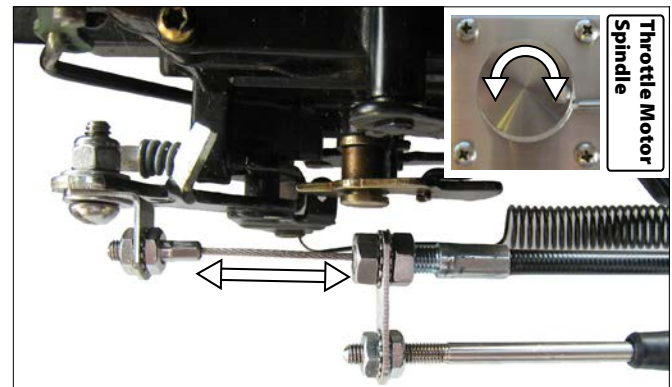
Step 5 *Top View* Install the control cable onto the existing throttle cable and throttle arm as shown. Use two K-lock nuts to secure the flat bracket to the existing throttle cable. Use the 1/4" bolt, two 1/4" washers, and nylon lock nut to secure the L-bracket to the throttle arm. Hand tighten. **NOTE:** Moving the driver throttle lever about half way down may help with clearance.



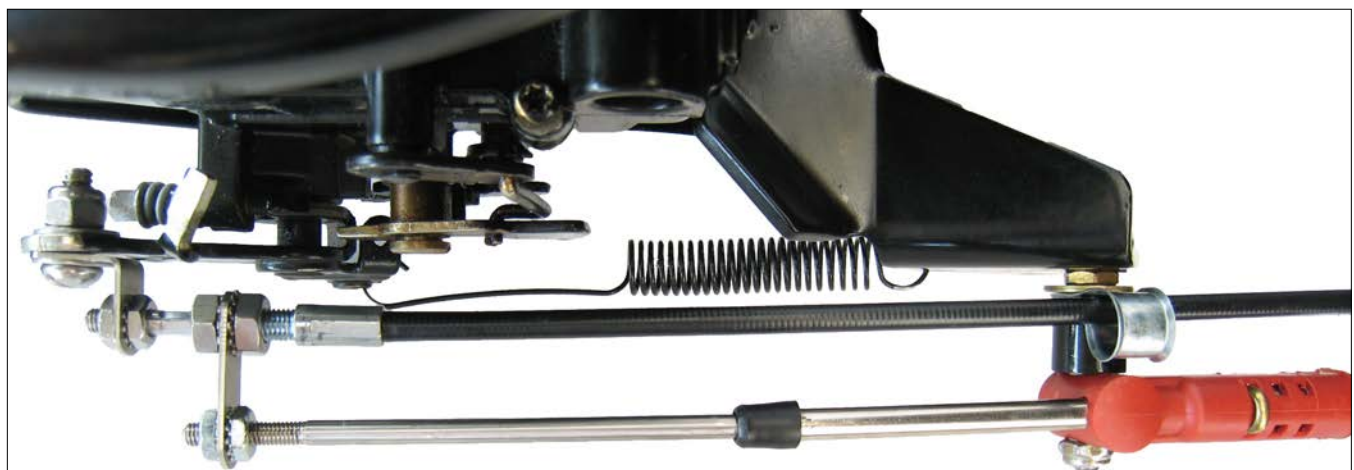
Step 6 Tighten the 1/4" slotted bolt and nylon lock nut fully with screwdriver and pliers then un-tighten 1/2 turn. L-bracket should be snug but able to swivel freely on the throttle arm.



Step 7 Slowly return driver throttle lever to 'neutral' position, if previously moved (if you have a Morse-type lever, adjust the driver throttle lever to just "in-gear" (see [troubleshooting](#)). Tighten the four K-lock nuts on the control cable with pliers. Slide the flat bracket up and down existing throttle cable to eliminate any gap as shown. Tighten the remaining two K-lock nuts on the existing throttle cable with pliers.



Step 8 Move the driver throttle lever to full open and back to neutral slowly to confirm the control cable moves freely without interference. Then with the driver throttle lever half way down, rotate the throttle motor spindle and confirm the throttle arm moves back and forth freely as shown.



Step 9 Finished control cable installation should look similar to the picture above. Control cable should be approximately parallel with the existing throttle cable from the cable guide to the throttle arm. To align, loosen throttle / control cable nuts, align cable, then re-tighten nuts. Replace the spark arrestor and/or engine cover if previously removed. Make sure control cable continues to be clear of any obstructions.

12 Display, CPU Installation

3) **Mount the display**

1. Remove the existing in-dash speedometer or other same-sized gauge that you would like to replace with the Ridesteady display.
2. Remove the nuts, washers, and mounting bracket from the rear of the Ridesteady display.
3. Insert the Ridesteady display into the hole in the dash.
4. From behind the dash, reinstall the mounting bracket, washers, and nuts.

4) **Connect the optional speedometer cable**

If you purchased the optional digital speedometer cable, you can connect the paddlewheel signal to a paddlewheel-compatible digital / electronic speedometer (note that many digital or electronic speedometers have an analog/traditional "needle" faceplate). Refer to the electrical connection diagram on the opposing page.

1. Connect the red wire to the digital speedometer's 12V mounting post (sometimes marked 'BAT' or 'IGN').
2. Connect the black wire to the digital speedometer's GND mounting post.
3. Connect the white or green wire to the digital speedometer's "SIG" (signal) mounting post.

IMPORTANT: If using the optional speedometer cable, all other wires except ground must be disconnected from the speedometer (i.e. if there are existing 12V or SIG wires already connected to the speedometer, they must be disconnected to prevent damage to the CPU).

NOTE: The Ridesteady speed control system displays the speed digitally in either MPH or KPH. The optional speedometer cable is typically used if you also desire an 'analog' (needle-type) speedometer. This is popular with boat owners that have two speedometer gauges in the dash.

Visit www.hydrophase.com for more information regarding compatible electronic speedometers.

5) **Connect the optional existing paddlewheel cable**

If your boat already has an installed paddlewheel that is used for displaying the speed on a speedometer, you may purchase the 'existing paddlewheel cable' to read the speed signal. Refer to the electrical connection diagram on the opposing page.

1. Connect the red wire to the SIGNAL post on the electronic speedometer.

WARNING: DO NOT CONNECT THE RED WIRE TO 12V POWER - CPU DAMAGE WILL RESULT!

2. Connect the black wire to the GND post on the electronic speedometer.

NOTE: If reading the speed from an existing paddlewheel, the optional digital speedometer cable should not be used (and is not necessary since the speedometer is already connected to the paddlewheel).

6) **Connect power and mount the CPU**

Refer to the electrical connection diagram on the opposing page.

1. Connect the power cable's red wire to switched 12V power (12V that is "ON" only when the ignition switch (key) is "ON"). Frequently you can connect the power cable's red wire to the 12V mounting post (sometimes marked 'BAT' or 'IGN') of one of your existing gauges. Alternatively, the power cable's red wire may be connected to an existing switched 12V wire coming from the ignition switch (usually purple in color) using a wire tap connector (obtainable at local hardware stores).

IMPORTANT: Make sure the red wire is connected to 12V that remains "ON" only when the ignition switch (key) is "ON". Connecting the power cable's red wire to an "always ON" 12V connection could result in battery drainage when the engine is OFF. Switched battery voltage may be verified with a multimeter or test light.

Do not connect the CPU power cable to the same gauge that the optional digital speedometer cable is connected to.

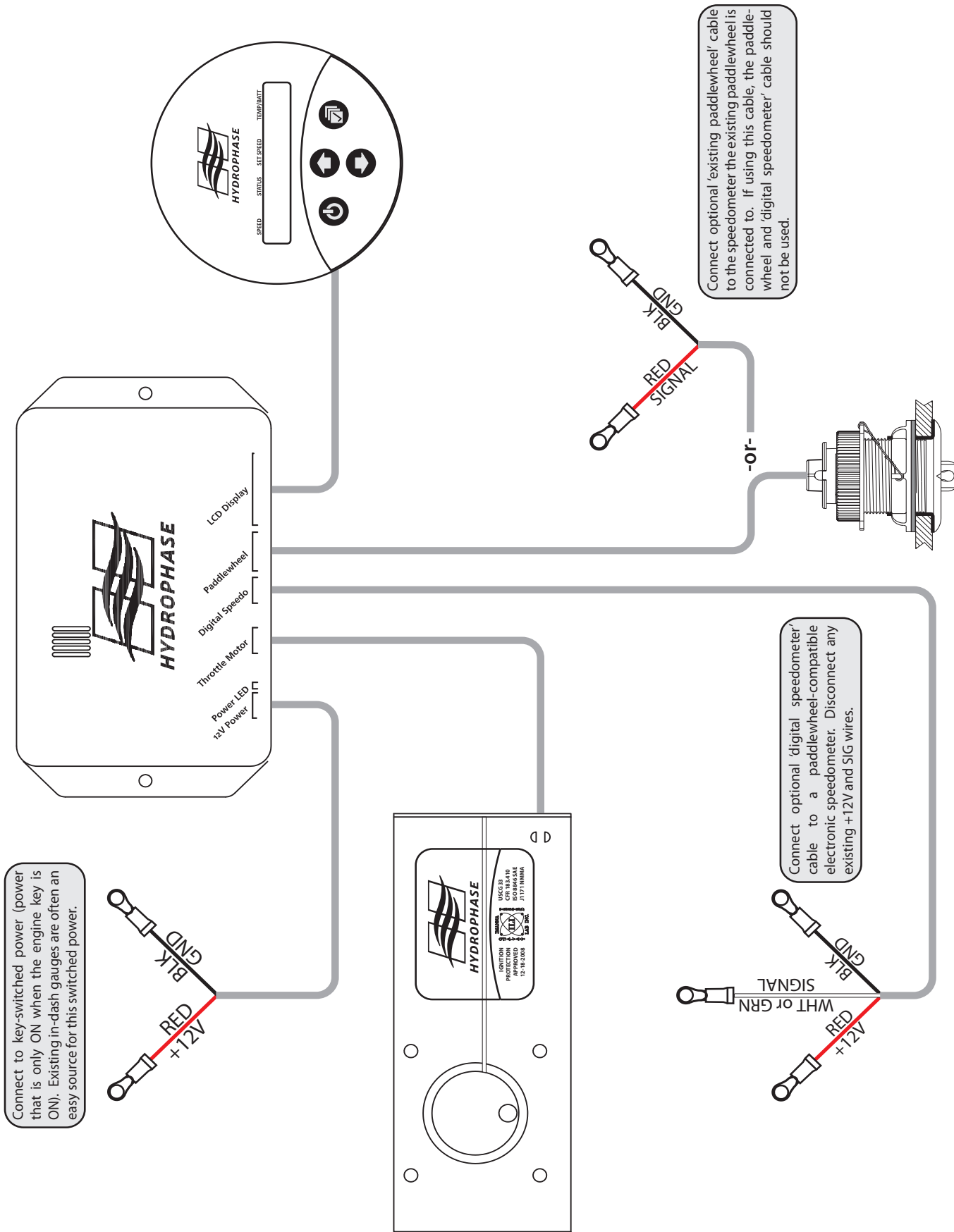
2. Connect the black wire to ground. Frequently you can connect the black wire to the GND mounting post of one of your existing gauges. Alternatively, you may connect to a grounding bar or known ground wire (frequently black in color).

3. Mount the CPU under the dash in a dry, relatively cool location (i.e. don't mount on top of a stereo amplifier). The included wood screws or zip-ties may be used to secure the CPU to whatever mounting points are convenient under your dash. Make sure the display cable, optional speedometer cable (if applicable), and power cable will reach the CPU before mounting. If using the included wood screws to mount the CPU, only mount to an 'inside wall'.

IMPORTANT: Make sure all cables have adequate strain relief as shown in figure 12-1 below. Do not hang the CPU by the cables as this may result in damaged wires and void the warranty.



Figure 12-1: CPU mounted to an inside wall under the dash. Alternatively, the included zip ties may be used to secure it to other convenient under-dash locations.



Connect to key-switched power (power that is only ON when the engine key is ON). Existing in-dash gauges are often an easy source for this switched power.

Connect optional 'existing paddlewheel' cable to the speedometer the existing paddlewheel is connected to. If using this cable, the paddlewheel and digital speedometer cable should not be used.

Connect optional digital speedometer cable to a paddlewheel-compatible electronic speedometer. Disconnect any existing +12V and SIG wires.

14 Paddlewheel Install

7) ***Install the paddlewheel***

Installing the paddlewheel is the most intimidating step, but is often easier than imagined with adequate planning. Follow the paddlewheel manufacturer's detailed step-by-step instructions (included with the paddlewheel) for installation. Some helpful tips:

Paddlewheel mount location

- Find a flat area on the bottom of the hull, close to the centerline, with no obstacles or protrusions in front of it (towards the bow) for 6+ feet.
- Turbulence-producing features to avoid (see figures 15-1 and 15-2):
 - Strakes (long hull protrusions)
 - Steps (if you have a stepped hull, install paddlewheel as far back from step as possible to avoid turbulence)
 - Drain hole flanges
 - Water intake grills
 - Tracking fins
 - Propellers
 - Rudders
- The desired location must be accessible from inside the hull and have sufficient clearance ("headroom") to pull the paddlewheel sensor out once mounted. 6" of headroom is recommended.
- Be aware of how your boat will be trailered or lifted when selecting a paddlewheel location. Don't target an install area that will likely hit a bunk or roller.
 - A 'blanking plug' is included to remove / protect the paddlewheel sensor during trailering / lifting if necessary.
- For the best performance, target paddlewheel locations that are closer to the center of the hull and remain in the water when the boat is planing.
- The location that generally meets the requirements above is in or around the bilge (engine compartment), offset a few inches from the centerline of the hull.
- Verify there is adequate space on the flat area where you plan to install the paddlewheel to fit the lip (flange) of the housing (see figures 14-1 and 14-2).

Boat-specific location suggestions

- For V-drive boats, frequently a good mounting location is in the engine bilge in front of or behind the engine, near the centerline, but clear from turbulence-producing features such as tracking fins, etc. (see figure 15-4).
- For inboard boats, frequently a good mounting location is in front of the engine a few inches back from the drain hole, near the centerline, but clear from turbulence-producing features such as tracking fins, etc. (see figure 15-5).
- For I/O boats, frequently a good mounting location is in the engine bilge in front of or behind the engine, near the centerline, but clear from turbulence-producing features (see figure 15-6).

General install tips

- Drill a small pilot hole from inside the boat to help guide the drilling of the 2" hole from the bottom of the boat. If there is not enough 'headroom' for the drill on the inside, drill the pilot hole from outside the boat.
- Use a new, quality hole saw with a drill to make the hole. These can be found at local hardware stores.
- Make sure the mounting location inside and outside the hull is clean and dry before installing the housing.
- Lightly sanding the surface and wiping clean with a damp towel will help eliminate built up dirt and help the sealant adhere to the hull.
- Use a good quality marine sealant, such as the line of 3M marine sealants found in many hardware or boating stores.
- Make sure the notch on the top or the arrow on the bottom of the paddlewheel housing is pointing towards the front (bow) and is parallel to the centerline before sealant cures (see figure 15-3).
- Remove all extra sealant from the lip (flange) of the paddlewheel housing on the bottom of the hull to prevent water turbulence.
- When installing the paddlewheel sensor into the housing, make sure the key of the paddlewheel fits into the notch of the housing. Hand tighten the cap nut.
- Run the paddlewheel sensor cable away from engine wires to under the dash where the CPU is located.

Figure 14-1: Incorrect paddlewheel housing installation: 2" hole not given enough clearance from hull flat area edge to prevent housing lip (flange) from "hanging off the edge".

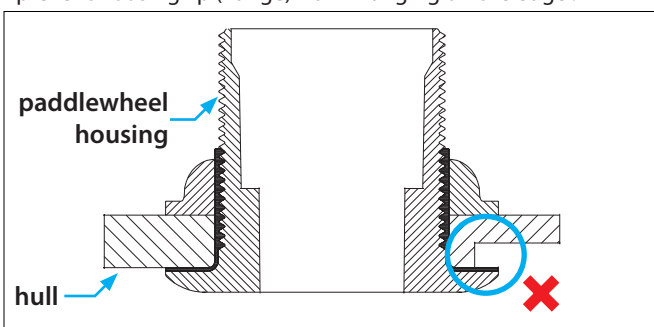
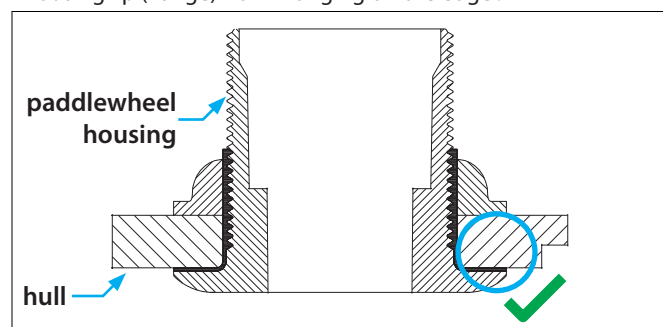
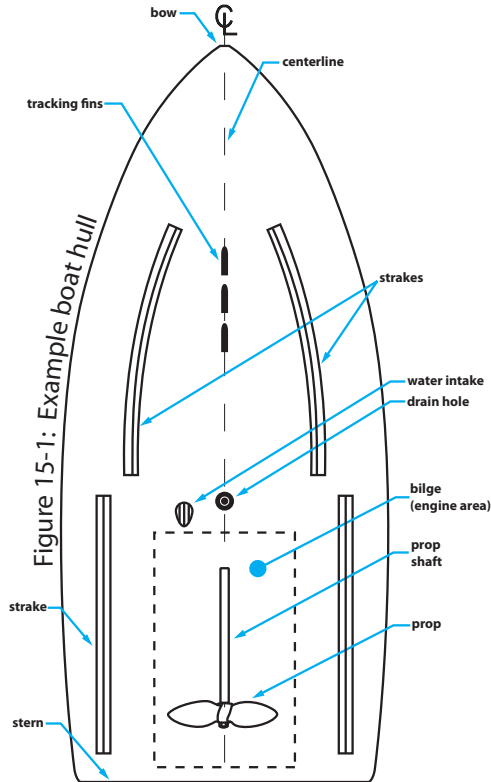
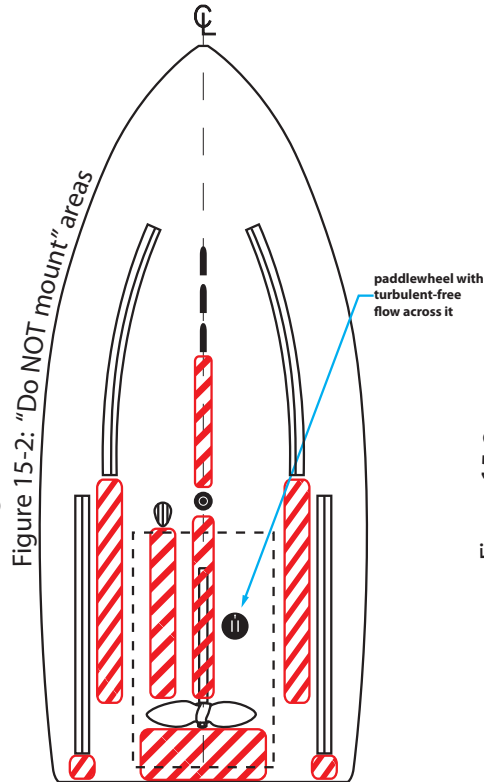


Figure 14-2: Correct paddlewheel housing installation: 2" hole given enough clearance from hull flat area edge to prevent housing lip (flange) from "hanging off the edge".

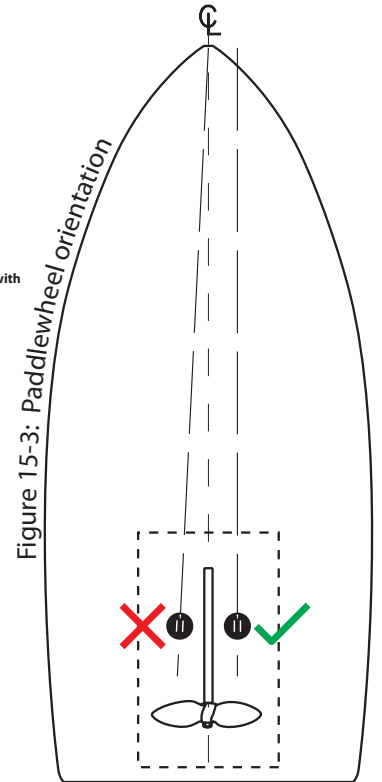




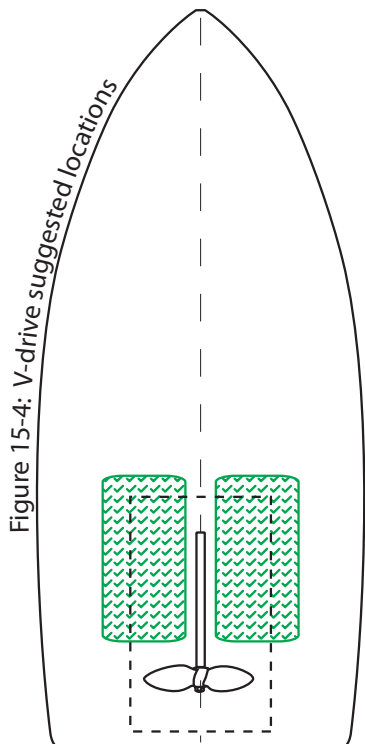
Bottom of example boat hull showing various turbulence-producing features to avoid. Your boat's features or feature locations may vary.



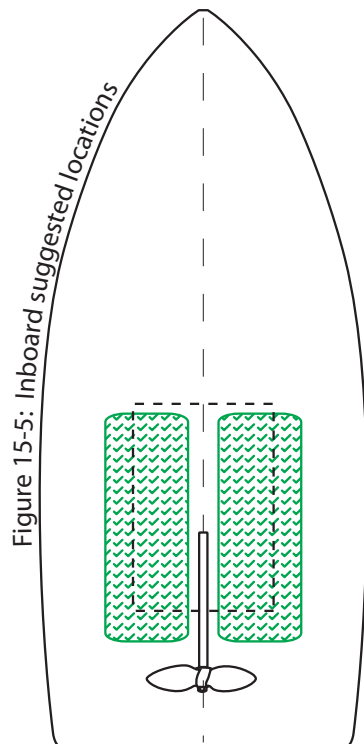
Red hatched areas indicate areas to AVOID locating the paddlewheel. Note the paddlewheel in this example is NOT located in these areas.



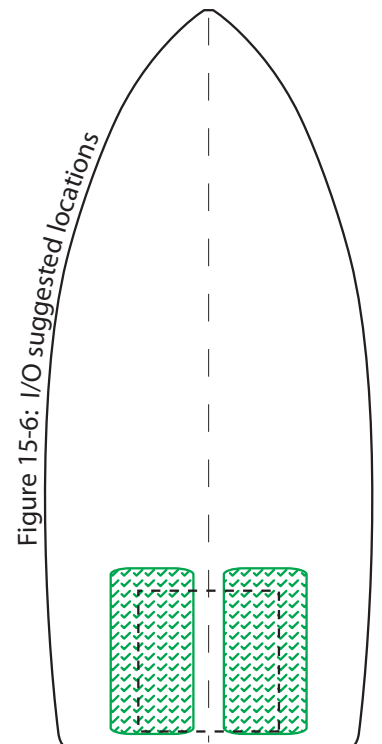
Example of correct and incorrect paddlewheel orientation. The arrow on the housing should point fwd and be parallel with the centerline.



Green hatched areas indicate suggested areas to locate the paddlewheel on a V-drive, inboard or I/O boat hull. Make sure the paddlewheel is not mounted behind turbulence-producing features. There are few features shown on these drawings as they will vary with each boat. Follow diagrams 1-3 above to avoid the turbulence-producing features on your boat. Note: the dashed line indicates approximate bilge area (engine compartment) in each respective boat.



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16 Paddlewheel Installation Pictures



Figure 16-1: 2000 Regal 2100 LSR I/O: [view from stern / rear of boat] Paddlewheel located about 8" from stern (rear end) and about 5" from centerline.



Figure 16-2: 2001 Ski Nautique V-drive: [view from stern / rear of boat] Paddlewheel located about 56" from stern (rear end) and about 7" from centerline.



Figure 16-3: 1992 Malibu Sunsetter Inboard: [view from bow / front of boat] Paddlewheel located slightly back from drain plug and about 6" from centerline. Locate paddlewheel as far back as possible while maintaining obstruction-free path in front of paddlewheel.

8) Connect the CPU / power test

Connect CPU

1. Route the paddlewheel and throttle motor power cables to under the dash where the CPU is located.

IMPORTANT: Try to route as far away as possible from engine ignition [spark plug] wires, as these wires may induce interference on the paddlewheel and throttle motor power cables. Use zip ties as necessary to secure the cables to available mounting points.

NOTE: A “fish tape” (also known as “draw wire” or “wire snake”) may be used to help route cables through hard to reach places. A fish tape can often be found in local hardware stores in the electrical section.

2. Connect the display, paddlewheel, optional speedometer, throttle motor, and power cables to the CPU.

Power / throttle connection test

1. Turn the engine ignition switch to the “ON” position (without starting the engine). The blue LED on the CPU should light up and the display should turn on, showing the software version and then the base screen.

2. While watching the throttle motor, turn the engine ignition switch back to the “OFF” position, and then “ON” again. The throttle motor should attempt to wind up any slack in the control cable and eliminate any gap between the threaded stud and the control cable (as indicated in the control cable install). If the driver throttle lever is in the neutral position, there should be no gap to begin with, so the motor will simply vibrate for a second.

3. With the engine ignition switch still in the “ON” position, move the driver throttle lever from the neutral position to the wide open position (100% throttle) and back to neutral. Verify the control cable passes through the cable guide easily without interference.

IMPORTANT: The control cable should never be secured to anything other than the throttle motor housing and throttle arm with the supplied hardware. It should never be “zip tied” (cable tied). The control cable should always be able to move easily through the cable guide and should not bind or hit any obstruction. Adjust the control cable connection, cable guide, and/or throttle motor housing to properly align and allow for interference free operation.

All fasteners should be checked periodically to ensure they have not vibrated loose.

If the above power test is successful, the speed control is ready for an on-the-water test run. Follow the procedures in the next section to perform a trial run in a safe environment before officially using the speed control full time.

18 Operation Guide: Overview

WARNING

The Ridesteady speed control system was designed from the ground up to be the easiest-to-use speed control system available. However, it is imperative that every driver / user of the Ridesteady speed control system read, understand, and follow the instructions below to provide for the safest operating environment possible.

The Ridesteady speed control system uses a “throttle reduction” method of manipulating the engine speed. When properly installed, the throttle motor can only reduce throttle from the amount of throttle provided by the driver. In other words, the Ridesteady speed control system can only slow down the boat from the amount of “gas” you give it, and cannot speed up past that point. So, if at anytime you would like to slow down or stop, simply pull back on the driver’s throttle lever as you normally would. The speed control system will reset the throttle back to it’s original position giving you manual throttle control.

The Ridesteady speed control system “remembers” the state it was in prior to being powered OFF. If the speed control was engaged when powered OFF, it will be engaged when it is later powered ON. This feature simplifies the operation of the speed control when the engine is turned OFF and ON repetitively to allow riders and skiers to enter / exit the boat. However, the driver must check the speed control display when powering ON the engine to be aware of its status.

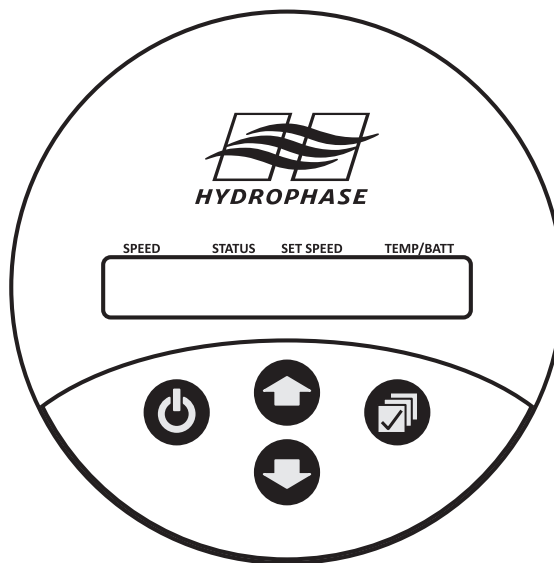
Always follow the recommended procedures as outlined by your boat manufacturer. Always run the bilge blowers for the proper duration before starting the engine or while travelling at low speeds.

Never operate a boat under the influence of drugs or alcohol. Never attempt to operate the Ridesteady speed control under the influence of drugs or alcohol.

Always keep your hand on the driver throttle lever to prevent it from moving during speed control operation and so that you may slow down or stop at any time.

Display overview

The Ridesteady speed control system uses a 4 button control panel with backlit LCD display to interface with the boat driver.



Display labels:

SPEED: Current speed

STATUS: Indicates whether speed control is ENGAGED (“E”) or OFF/DISENGAGED (no “E”)

SET SPEED: Desired target speed

TEMP/BATT: Water temperature or battery voltage

Button functions:



ON/OFF button

Cycles between “OFF” and “ENGAGED” mode



MENU button

Momentary press: cycles between display modes:
Water temperature
Battery voltage

Press and hold: enters MENU mode

(speed control must be OFF / not ENGAGED to enter MENU mode)

MENU mode: cycles through settings



UP button

Increases set speed

MENU mode: Increases setting value



DOWN button

Decreases set speed

MENU mode: Decreases setting value

The following procedures assume the engine is started and that the rider / skier is ready to be towed behind the boat.

Automatic speed control procedure

1. Adjust desired set speed

Using the UP and DOWN arrow keys, set the desired set speed. This may also be adjusted while the speed control is actively regulating the speed. The set speed will be “remembered” from the prior use, even after powered OFF.

2. Engage the speed control

Press the ON / OFF button to engage the speed control system. An “E” will appear on the display under STATUS, indicating “ENGAGED”. If an “E” is already present, the speed control system is already engaged from the last time it was ON (the speed control system will remember its engaged status even after it is powered OFF). **Warning:** When the speed control is engaged, the driver should be aware that it will begin operating once a certain speed has been reached.

3. Accelerate past the set speed to activate speed control

The Ridesteady speed control system uses a ‘throttle reduction’ method of manipulating the engine speed. The driver must push down the throttle lever slightly more than is normally necessary to maintain the desired set speed. Prior to reaching the set speed, the speed control will begin controlling the throttle to avoid ‘overshooting’ the set speed by too much (this may be detected as a brief reduction in speed). It will then regulate the throttle to maintain the set speed. The UP / DOWN buttons can be used to adjust the set speed during operation. If the ^^^ symbol appears under STATUS, simply push the throttle lever down more to speed up a bit.

4. Pull back on throttle to slow down / reset throttle

When the rider / skier falls, or when you would like to slow down or stop for any reason, simply pull back on the throttle lever as you normally would. The speed control will attempt to maintain the speed until it falls below a certain threshold (determined by the set speed and other factors) and will then reset the throttle. “THROTTLE RST: 00” will appear on the display, counting down until the throttle is back to the original position. The speed control will remain engaged and ready to ‘take over’ again when the driver begins to accelerate towards the set speed again.

5. Turn off the speed control to return to manual throttle

When it is desired to have ‘manual throttle’ control, disengage the Ridesteady speed control system by pressing the ON/OFF button so that the “E” (engaged) status disappears. The throttle will now behave like a normal manual throttle, without any speed control. **IMPORTANT:** Disengaging the speed control will reset the throttle; only disengage when the driver throttle lever is in the neutral position.

Traditional “cruise control” procedure

If it is desired to manually engage the speed control, the speed control can behave similar to a typical automobile cruise control.

Follow the same procedures as the ‘automatic speed control’ but accelerate slightly past the desired set speed first, then press the ON/OFF button to engage the speed control.

Throttle lever position

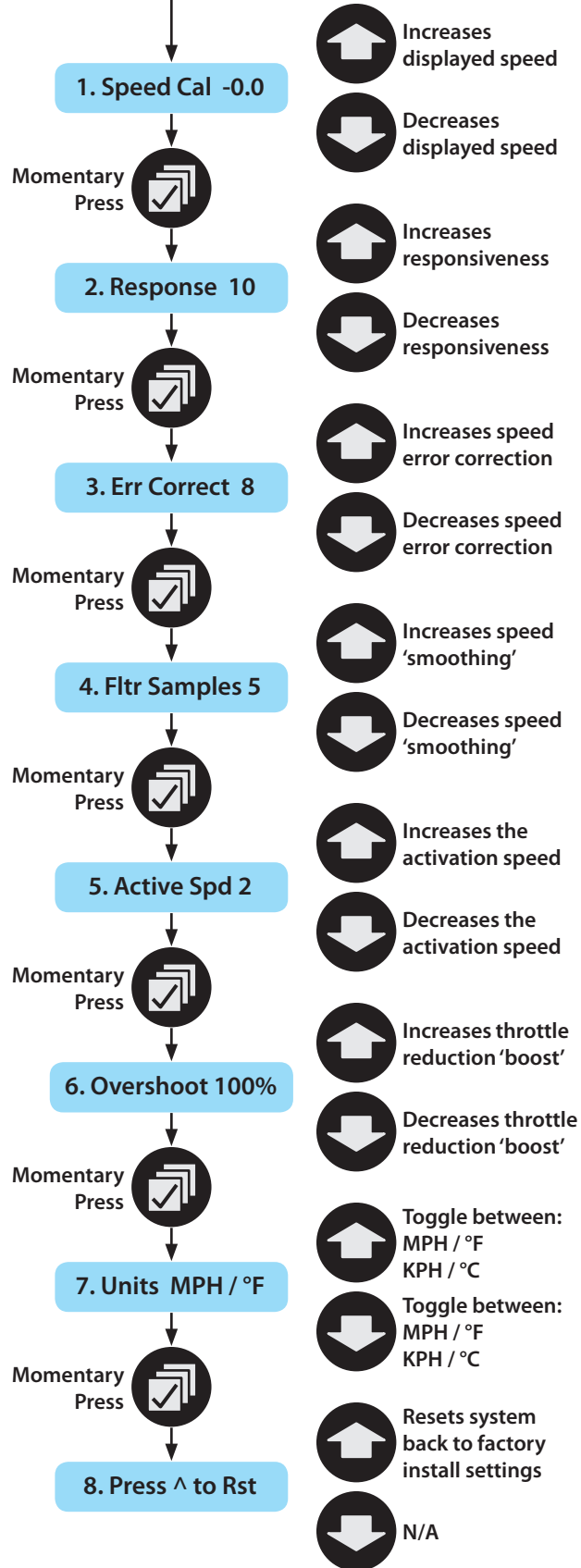
It is only necessary to push the throttle lever down slightly more than is normally necessary to maintain the desired set speed. However, if your throttle lever has a tendency to ‘pop up’ (return to the neutral position) at the speed you’re going (or you prefer a full-throttle start), the throttle lever may be pushed down further to mitigate this issue.

If the speed control slows down too much during the initial acceleration, refer to the MENU settings page for information on how to reduce the ‘overshoot’ setting.

20 Operation Guide: MENU settings

Press & hold 2 seconds when speed control **disengaged**  Enters / Exits MENU

MENU settings
Follow the guide below to customize the Ridesteady speed control system to your preference. Often the default settings provide the best result and require no adjustments.



Speed Cal changes the calibration of the speed. Many boats will need no calibration at all, but if necessary, test the accuracy of the speed at 20 MPH with a GPS or other device. **NOTE:** The speed control measures the speed relative to the water, not land. If there are wind waves or a current in the water you're travelling in, the GPS speed will be incorrect and will vary depending on direction of travel.

Response varies the amount the speed control will respond when a change in speed is detected. Lower numbers generally give 'smoother' rides, but are less reactive to speed changes. Higher numbers generally keep the speed closer to the set speed when towing a wakeboarder / skier, but are less smooth. **Range [8-20]; Default: 10.**

Err Correct varies the amount the speed control will try to correct 'speed error' (when the speed is not near the set speed). Lower numbers generally give smoother rides, but are slower to hit the set speed. Higher numbers keep the speed closer to the set speed, but are more aggressive in maintaining the set speed. **Range [1-10]; Default: 8.**

Fltr Samples adjusts the number of speed samples that are sent to the real time filter. Increasing this number results in 'smoother' operation while decreasing this number results in more responsive control. **Range [1-20]; Default: 5.**

Active Spd sets the amount below the set speed that the speed control will begin regulating the speed at (to help avoid overshoot). Lower numbers indicate the speed control will become active at a lower speed. Higher numbers indicate the speed control will wait until the speed is closer to the set speed (higher) before activating. **Range [1-10]; Default: 2.**

Overshoot [control] adds an extra 'boost' of throttle reduction after the speed control becomes active in order to reduce 'set speed overshoot'. Adjust this to your driving style; if you are aggressive at accelerating you may try increasing preadjust. If you are more gradual in your acceleration, you may try decreasing preadjust. **Range [0% (OFF) - 200%]; Default: 100%.**

Units toggles between US-customary and metric units of measure:
Miles per hour / degrees Fahrenheit
Kilometers per hour / degrees Celsius.

Pressing the UP button will reset the Ridesteady speed control system back to its original factory settings.

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22 Appendix - Alternate Throttle Connections

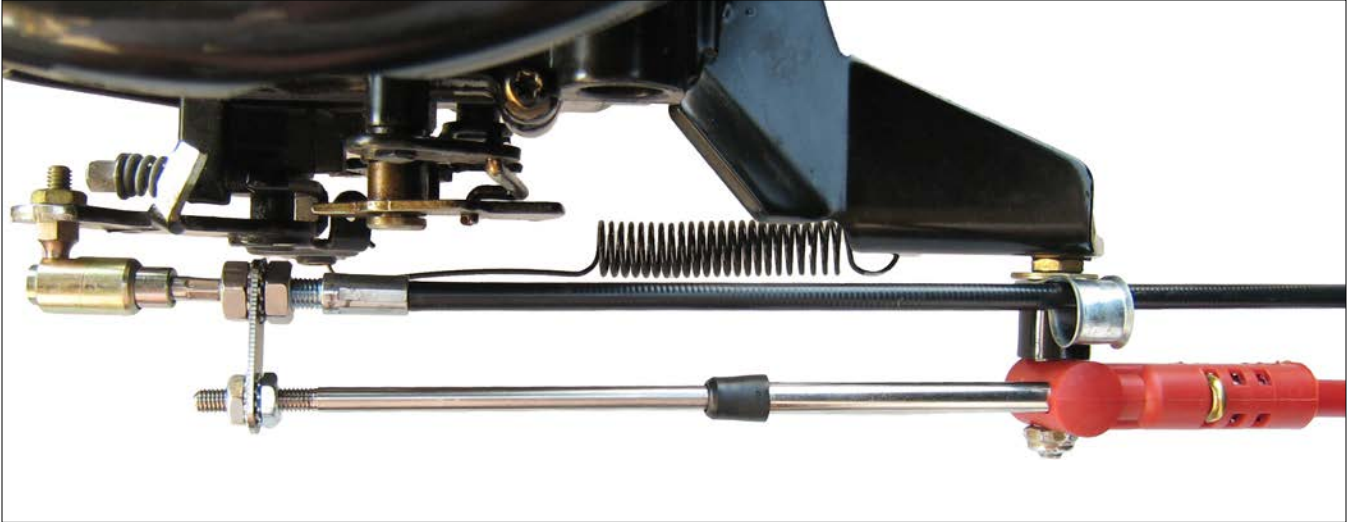


Figure 22-1: [top view] Horizontal orientation w/quick release connector (not included)



Figure 22-2: [side view] Vertical orientation

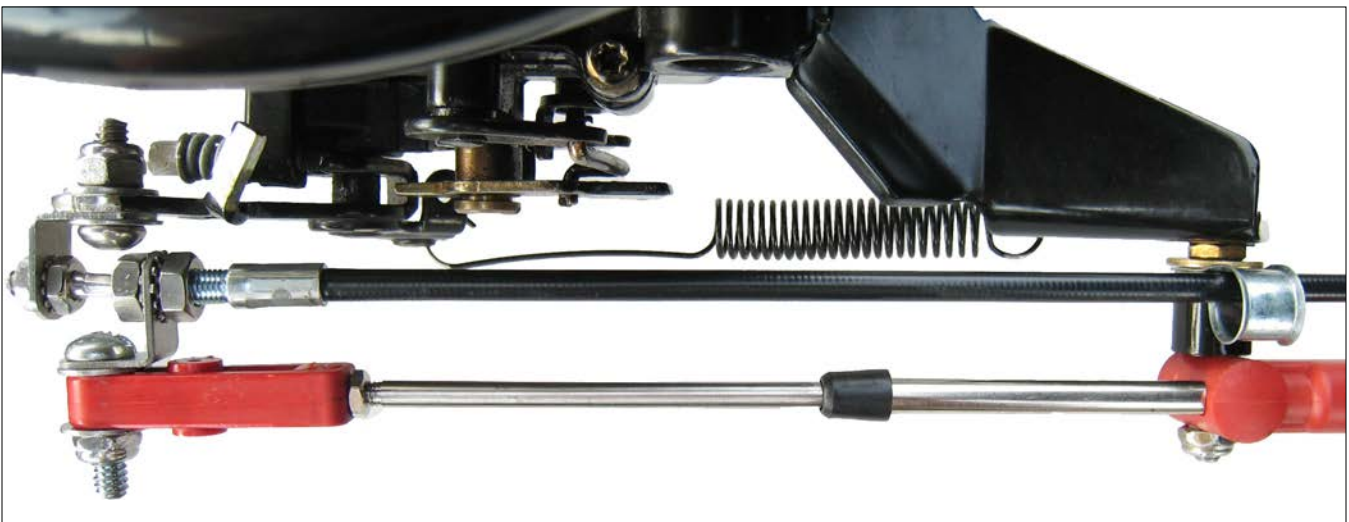


Figure 22-3: [top view] Horizontal orientation keeping original throttle connector attached. A similar connection may be used if your throttle connector does not detach from the throttle cable.

Issue: When the driver throttle lever is moved forward from neutral to "in gear", the engine accelerates before it gets in gear. Or, a high idle speed is present when it wasn't before installation.

Fix: Some driver throttle levers, such as the Morse MV-2, use a "spring action" that allows the driver to push the throttle lever forward without changing the engine speed until the boat is in gear. To accommodate this type of throttle lever, follow the steps in the respective "Control Cable Install" section, but instead of adjusting the gap when the driver throttle lever is in neutral, adjust the gap when the driver throttle lever is "just in gear". This will provide the resistance the throttle lever needs for the spring action to work and prevent premature engine acceleration / high idle.

Issue: Garbled characters appear on the screen -or- screen goes blank -or- things aren't quite right.

Fix: "EMI" or "Electromagnetic Interference" may be interfering with the CPU. While many filters are in place to prevent any issues, if wires are routed near high voltage sources (such as spark plug wires, the coil or distributor, etc.), severe interference may find its way to the CPU. Move all wires as far away from engine ignition parts. Where it is unavoidable to get close to engine ignition parts, try to route the Ridesteady wires perpendicularly to the engine wires and as far away as possible. Avoid 'bundling' the throttle motor power cable with any other wire other than the power cable.

OWNER'S GUIDE & INSTALLATION INSTRUCTIONS

Shorty™ Thru-Hull Speed/Temp Sensor with Valve

Low Profile and Flush Models: S300 and ST300

U.S. Patents: 4,898,029; Re 33,982; 5,186,050. Australian Patent 605,281.
Canadian Patent 1,313,775. Japanese Patent 1851014

11/04
17-274-01 rev. 03

IMPORTANT: Please read the instructions completely before proceeding with the installation. These instructions supersede any other instructions in your instrument manual if they differ.

CAUTION: NEVER USE SOLVENTS!

Cleaners, fuel, paint, sealants, and other products can contain strong solvents, such as acetone, which attack many plastics greatly reducing their strength.

Applications

- Recommended for fiberglass or metal hulls only
- *Never* install a plastic thru-hull housing in a wood hull, since swelling of the wood can possibly fracture the plastic.
- Low profile P371 recommended for cruising sailboats and planing hull powerboats
- Flush P398 recommended for racing sailboats and high-speed powerboats
- Minimum headroom required: 153mm (6")
- Accommodates hull thickness:

Minimum	6mm (1/4")
Maximum	25mm (1")

Tools & Materials

Water based *or* mineral spirits based antifouling paint
(**mandatory in salt water**)

Safety goggles

Dust mask

Electric drill with minimum 10mm (3/8") chuck capacity

Drill bit 3mm *or* 1/8"

Hole saw 51 mm *or* 2"

Countersink tool (installing a P398 flush housing)

Sandpaper

Mild household detergent *or* weak solvent (such as alcohol)

File (installation in a metal hull)

Marine sealant (suitable for below waterline)

Additional washer [aluminum hull less than 6mm (1/4") thick]

Zip-ties

Installation in a cored fiberglass hull (see page 3):

Hole saw for hull interior 60mm *or* 2-3/8"

Fiberglass cloth and resin

or Cylinder, wax, tape, and casting epoxy

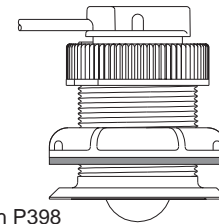
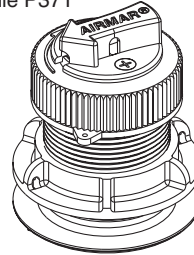
Pretest

Connect the sensor to the instrument and spin the paddlewheel. Check for a speed reading (and the approximate air temperature if applicable). If there is no reading(s), check all the connections and repeat the test. If there is still no reading or it is inaccurate, return the product to the place of purchase.

Record the information found on the cable tag for future reference.

Part No. _____ Date _____

Low Profile P371



Flush P398

Antifouling Paint

Aquatic growth can accumulate rapidly on the sensor's surface reducing performance within weeks. Surfaces exposed to salt water *must* be coated with antifouling paint. Use **water-based or mineral spirits based** antifouling paint only. *Never* use ketone-based paint, since ketones can attack many types of plastic possibly damaging the sensor.

It is easier to apply antifouling paint before installing the sensor, but allow sufficient drying time. Reapply paint every 6 months or at the beginning of each boating season. Paint the following surfaces (see Figure 1):

- Outside wall of the paddlewheel insert below the lower O-ring
- Paddlewheel cavity
- Paddlewheel
- Bore of the housing up 30mm (1-1/4")
- Exterior lip of the housing
- Blanking plug below the lower O-ring including the exposed end

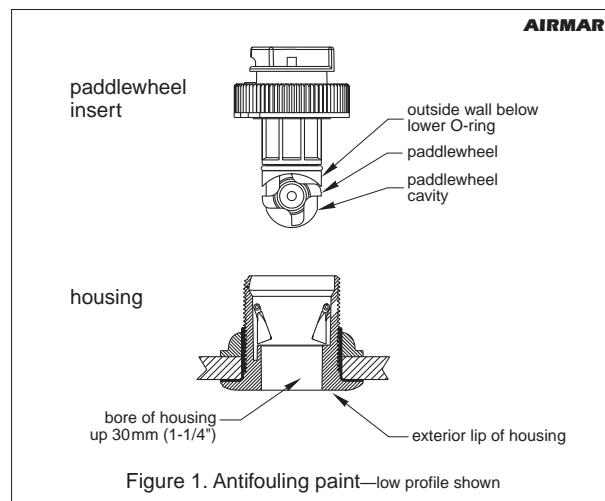


Figure 1. Antifouling paint—low profile shown

Mounting Location

Turbulence-free water *must* flow over the paddlewheel at all boat speeds. Choose an accessible spot inside the vessel. Allow a minimum of 153mm (6") of headroom for the height of the housing, tightening the nuts, and removing the insert.

- **Fin keel sailboats**—Mount on or as close as possible to the centerline and forward of the fin keel 300–600mm (1–2').
- **Full keel sailboats**—Mount amidships and away from the keel at the point of minimum deadrise angle.
- **Displacement hull powerboats**—Locate amidships near the centerline.
- **Planing hull powerboats**—Mount well aft to insure that the sensor is in contact with the water at high speeds.

Caution: Do not mount in an area of turbulence or bubbles: near water intake or discharge openings; behind strakes, fittings or hull irregularities.

Caution: Never mount the sensor directly ahead of a depth transducer, since turbulence generated by the paddlewheel's rotation will adversely affect the transducer's performance, especially at high speeds.

Installation

Cored fiberglass hull—Follow separate instructions on page 3.

Hole Drilling

Warning: Always wear safety goggles and a dust mask.

1. Drill a 3mm or 1/8" pilot hole from inside the hull. If there is a rib, strut, or other hull irregularity near the selected mounting location, drill from the outside. (If the pilot hole is drilled in the wrong location, drill a second hole in a better location. If the hull is fiberglass, apply masking tape to the outside of the hull over the incorrect hole and fill it with epoxy.)
2. Using a 51mm or 2" hole saw, cut a hole from outside the hull. **P398**—This flush model requires countersinking the housing to create a "seat" in the hull.
3. Sand and clean the area around the hole, inside and outside, to ensure that the sealant will adhere properly to the hull. If there is any petroleum residue inside the hull, remove it with either mild household detergent or a weak solvent (alcohol) before sanding. **Metal hull**—Remove all burrs with a file and sandpaper.

Bedding

Apply a 2mm (1/16") thick layer of marine sealant around the lip of the housing that contacts the hull and up the sidewall of the housing. The sealant *must* extend 6mm (1/4") higher than the combined thickness of the hull, any washer(s), and the hull nut (see Figure 2). This will ensure there is sealant in the threads to seal the hull and hold the hull nut securely in place.

Installing

Caution: Never pull, carry, or hold the sensor by the cable as this may sever internal connections.

1. From outside the hull, push the housing into the mounting hole using a twisting motion to squeeze out excess sealant. *Align the arrow on the lip of the housing to point forward toward the bow* (see Figure 2). If the sensor is not installed on the centerline of the boat, angle the housing slightly toward the centerline to align it with the water flow.

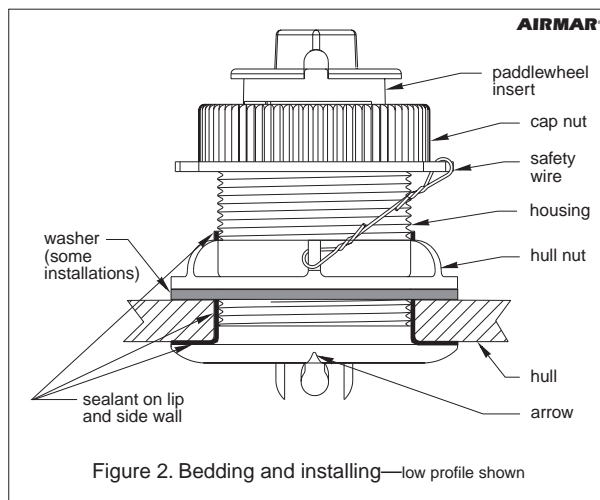


Figure 2. Bedding and installing—low profile shown

2. From inside the hull, slide any washer(s) onto the housing.

Note: Some installations do not have a washer.

Aluminum hull less than 6mm (1/4") thick—Use an additional rubber, plastic, or fiberglass washer. *Never* use wood, since it will swell, possibly fracturing the plastic housing. *Never* use bronze, since electrolytic corrosion will occur.

Caution: Do not clamp tightly on the wrenching flats, possibly causing the housing to fracture.

3. Screw the hull nut in place, *being sure* the notch on the upper rim of the housing is still positioned forward toward the bow. **Hand-tighten only. Do not** over tighten.
4. Remove any excess sealant on the outside of the hull to ensure smooth water flow over the paddlewheel.

WARNING: The O-rings must be intact and well lubricated to make a watertight seal.

5. After the sealant cures, inspect the O-rings on the paddlewheel insert (replace if necessary) and lubricate them with the silicone lubricant supplied (see Figure 3).
6. Slide the paddlewheel insert into the housing with the *arrow on the top pointing forward toward the bow*. Seat it into place with a pushing twisting motion until the key fits into the notch. The arrow on the top of the insert, the notch, and the arrow on the lip of the housing will all be aligned. *Be careful* not to rotate the housing and disturb the sealant.

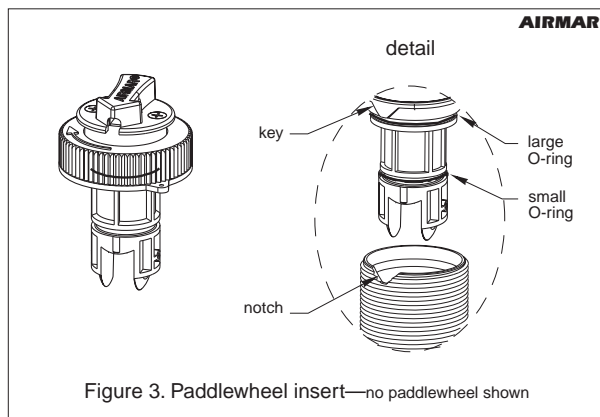


Figure 3. Paddlewheel insert—no paddlewheel shown

26 Appendix - Paddlewheel Manufacturer Installation Instructions

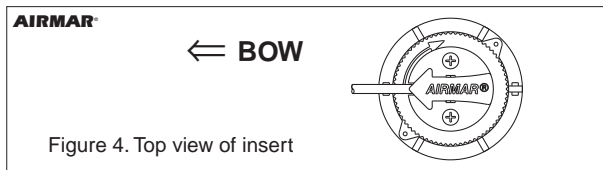


Figure 4. Top view of insert

Screw the cap nut several turns, then check that the insert's arrow is still facing forward toward the bow (see Figure 4). Continue to tighten the cap nut. **Hand-tighten only. Do not over-tighten.**

Warning: Always attach the safety wire to prevent the insert from backing out in the unlikely event that the cap nut fails or is screwed on incorrectly.

- Attach the safety wire to one eye in the hull nut. Lead the wire in a counterclockwise direction and thread it through one eye in the cap nut. Twist the end securely to the wire (see Figure 2).

Caution: If your sensor came with a connector, DO NOT remove it to ease cable routing. If the cable must be cut and spliced, use Airmar's splash-proof Junction Box 33-035 and follow the instructions provided. Cutting the cable or removing the connector, except when using Airmar's junction box, will void the sensor warranty.

- Route the cable to the instrument, *being careful* not to tear the cable jacket when passing it through the bulkhead(s) and other parts of the boat. To reduce electrical interference, separate the sensor cable from other electrical wiring and the engine. Coil any excess cable and secure it in place with zip-ties to prevent damage.
- Refer to the instrument owner's manual to connect the sensor to the instrument.

Checking for Leaks

Warning: Never install a thru-hull sensor and leave the boat in the water unchecked for several days.

When the boat is placed in the water, **immediately** check around the thru-hull sensor for leaks. Note that very small leaks may not be readily observed. It is best not to leave the boat in the water for more than 3 hours before checking it again. If there is a small leak, there may be considerable bilge water accumulation after 24 hours. *If a leak is observed, repeat "Bedding" and "Installing" immediately (see Figure 2).*

Installation in a Cored Fiberglass Hull

The core (wood or foam) **must** be cut and sealed carefully. The core **must** be protected from water seepage, and the hull **must** be reinforced to prevent it from crushing under the hull nut allowing the housing to become loose.

Warning: Always wear safety goggles and a dust mask.

- Drill a 3mm or 1/8" pilot hole from inside the hull. If there is a rib, strut or other hull irregularity near the selected mounting location, drill from the outside. (If the hole is drilled in the wrong location, drill a second hole in a better location. Apply masking tape to the outside of the hull over the incorrect hole and fill it with epoxy.)
- Using a 51 mm or 2" hole saw, cut the hole from outside the hull through the *outerskin* only (see Figure 5).

- From inside the hull, use a 60mm or 2-3/8" hole saw to cut through the *innerskin* and most of the core. The core material can be very soft. Apply only light pressure to the hole saw after cutting through the inner skin to avoid accidentally cutting the *outerskin*.

- Remove the plug of core material so the *inside* of the outer skin and the inner core of the hull is fully exposed. Sand and clean the inner skin, core, and the outer skin around the hole.

Caution: Completely seal the hull to prevent water seepage into the core.

- If you are skilled with fiberglass, saturate a layer of fiberglass cloth with a suitable resin and lay it inside the hole to seal and strengthen the core. Add layers until the hole is the correct diameter.

Alternatively, a hollow or solid cylinder of the correct diameter can be coated with wax and taped in place. Fill the gap between the cylinder and hull with casting epoxy. After the epoxy has set, remove the cylinder (see Figure 5).

- Sand and clean the area around the hole, inside and outside, to ensure that the sealant will adhere properly to the hull. If there is any petroleum residue inside the hull, remove it with either mild household detergent or a weak solvent (alcohol) before sanding.

- Proceed with "Bedding" and "Installing" on page 2.

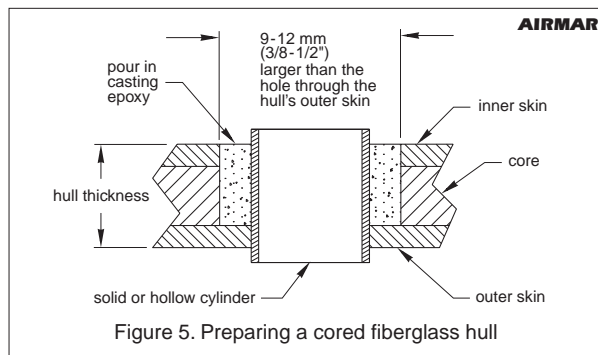


Figure 5. Preparing a cored fiberglass hull

Operation & Maintenance

CAUTION: Do not remove the screws on the top of the sensor. To remove the insert, unscrew the cap nut. This will jack the insert up. Then remove the cap nut and insert as a single unit.

How the Valve Works

The sensor incorporates a self-closing valve which minimizes the flow of water into the boat when the paddlewheel insert is removed. The curved flap valves are activated by water pressure. Water pushes the flap valves upward to block the opening, so there is no gush of water into the boat (see Figure 6).

WARNING: THE VALVE IS NOT A WATERTIGHT SEAL! Always install the paddlewheel insert or blanking plug secured with the safety wire for a watertight seal.

Using the Blanking Plug

To protect the paddlewheel insert, use the blanking plug when:

- The boat will be kept in salt water for more than a week.
- The boat will be removed from the water.
- Aquatic growth build-up on the paddlewheel is suspected due to inaccurate readings from the instrument.

Caution: DO NOT remove the screws on the top of the transducer. To remove the insert, unscrew the cap nut. This will jack the insert up. Then remove the cap nut and insert as a single unit.

WARNING: The O-rings must be intact and well lubricated for a watertight seal.

1. Inspect the O-rings on the blanking plug (replace if necessary) and lubricate them with the silicone lubricant supplied or petroleum jelly (Vaseline®) (see Figure 6).
2. Remove the safety wire from the cap nut (see Figure 2).

WARNING: Never leave the boat unattended without either the paddlewheel insert or blanking plug installed.

3. To remove the paddlewheel insert from the housing, unscrew the cap nut. This will jack the insert out of the housing. Do not unscrew the screws. Replace the paddlewheel insert with the blanking plug. Seat it into place with a pushing twisting motion until the key fits into the notch in the housing. Screw the cap nut in place and hand-tighten only. Do not over tighten (see Figure 6).

Note: If the flap valves do not move freely and block the blanking plug from being inserted, clean the valve assembly so the flap valves move freely and rest against the valve housing. In the unlikely event that the flap valves cannot be freed, you may need to push the flap valves down or break them off.

Warning: Always attach the safety wire to prevent the insert from backing out in the unlikely event that the cap nut fails or is screwed on incorrectly.

4. Reattach the safety wire to the cap nut (see Figure 2).

Winterizing

After the boat has been hauled for winter storage, remove the blanking plug to let the water drain away before re-inserting it. This will prevent any water from freezing around the blanking plug and possibly cracking it.

Servicing the Paddlewheel Insert

Aquatic growth can impede or freeze the paddlewheel's rotation and *must* be removed. Clean the surface using a Scotch-Brite® scour pad and mild household detergent. If fouling is severe, push out the paddlewheel shaft using a spare shaft or a 4D finish nail with a flattened point. Then, lightly wet sand the surface with fine grade wet/dry paper.

The water lubricated paddlewheel bearings have a life of up to 5 years on low-speed boats [less than 10kn (11MPH)] and 1 year on high-speed vessels. Paddlewheels can fracture and shafts can bend due to impact with water borne objects and mishandling in boat yards. O-rings *must* be free of abrasions and cuts to ensure a watertight seal. A replacement Paddlewheel Kit 33-350-01 is available.

1. Using the new paddlewheel shaft, push the old shaft out about 6 mm (1/4"). With pliers, remove the old shaft (see Figure 6).
2. Place the new paddlewheel in the cavity with the flat side of the blade facing the same direction as the arrow on the insert top.
3. Tap in the new shaft until the ends are flush with the insert.
4. Install one large and one small O-ring (see Figure 6 detail).
5. Place the remaining two O-rings in similar positions on the blanking plug.

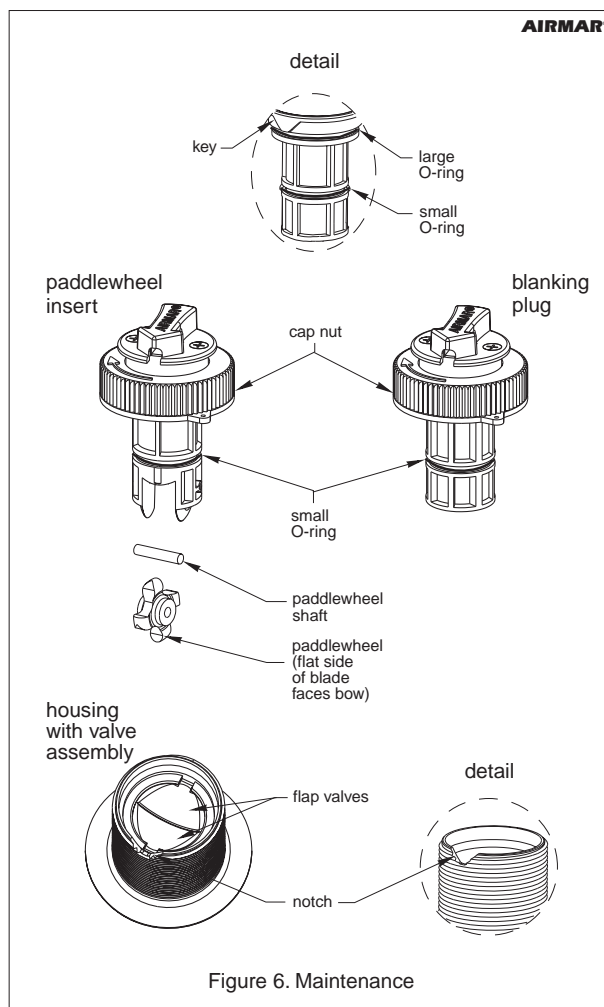


Figure 6. Maintenance

Replacement Parts

Lost, broken, and worn parts should be replaced immediately. Obtain the following parts from your marine dealer or instrument manufacturer.

Part	Airmar Part Number
Blanking Plug	20-288-01
Paddlewheel Kit	33-350-01
Cap Nut	04-011
Hull Nut	04-004
Housing (P371), Valve, and Hull Nut Kit	33-361-01

Sensor Replacement

The information needed to order a replacement Airmar sensor is printed on the cable tag. Do not remove this tag. When ordering, specify the part number and date. For convenient reference, record this information on the top of page one.

28 Appendix - Purchase Agreement

PURCHASE AGREEMENT

PLEASE READ THIS AGREEMENT CAREFULLY BEFORE PURCHASING THE PRODUCT. BY CLICKING "I AGREE", YOU AGREE TO BECOME BOUND BY THE TERMS AND CONDITIONS OF THIS AGREEMENT. IF YOU DO NOT AGREE TO ALL OF THE TERMS AND CONDITIONS OF THIS AGREEMENT, CLICK ON THE "CANCEL" BUTTON AND YOU WILL NOT HAVE ANY RIGHT TO PURCHASE THE PRODUCT. HYDROPHASE'S AGREEMENT TO SELL YOU ANY OF THE PRODUCTS IS EXPRESSLY CONDITIONED UPON YOUR AGREEMENT TO ALL THE TERMS AND CONDITIONS OF THIS AGREEMENT, TO THE EXCLUSION OF ALL OTHER TERMS. IF THESE TERMS AND CONDITIONS ARE CONSIDERED AN OFFER BY HYDROPHASE, THEN ACCEPTANCE IS EXPRESSLY LIMITED TO THESE TERMS.

THIS PURCHASE AGREEMENT (this "Agreement") is made effective as of the Effective Date (as defined below), by and between HYDROPHASE, LLC, a Texas limited liability company ("Hydrophase"), and the party clicking on "I AGREE" below as the "Buyer" ("You" or "Buyer"). You and Hydrophase may be referred to individually as a "Party" or collectively as the "Parties."

- 1. Purchase of Product.** Hydrophase agrees to sell to You, and You agree to buy from Hydrophase, the product or products (collectively, the "Product") listed on the separate order form, and in the quantities and at the purchase price listed thereon. Upon Hydrophase's receipt of Your payment in full and Your agreement to the terms and conditions of this Agreement, Hydrophase shall cause the Product to be delivered to You at the shipping address specified by You. Hydrophase makes no representation or warranty concerning the time of shipment or delivery of the Product.
- 2. Effective Date.** The effective date of this Agreement (the "Effective Date") shall be the later of (1) the date You sign this Agreement, either digitally or physically, and (2) the date Hydrophase actually receives payment of the full purchase price for the Product.
- 3. Returns.** Buyer may return the Product to Hydrophase within sixty (60) days after the Effective Date if and only if the Product is returned to Hydrophase in its original condition and is in good working order when received by Hydrophase. Buyer shall pay all shipping costs related to any such returns.
- 4. Sole and Exclusive Remedies of Buyer.** The exclusive remedies of Buyer under this Agreement shall be (1) the return of the Product (in good working order) to Hydrophase and the reimbursement of the purchase price from Hydrophase, OR (2) the repair and replacement of a faulty or defective Product pursuant to the Limited Warranty attached hereto as Exhibit A. It is the express intent of the Parties that the remedies set forth in this Agreement are the sole and exclusive remedies of Buyer and are not cumulative of the remedies provided in the Texas Business and Commerce Code. In the event of a breach or repudiation of this Agreement by Hydrophase, Buyer shall not be entitled to any personal injury damages, property loss damages, economic loss damages, incidental or consequential damages, or any other damages except as expressly set forth herein.
- 5. LIMITATION OF LIABILITY.** IN NO EVENT SHALL HYDROPHASE, ITS MANAGERS, MEMBERS, OFFICERS, AGENTS, EMPLOYEES, ASSIGNS AND/OR DEALERS BE LIABLE TO BUYER OR BUYER'S CUSTOMERS, AGENTS, ASSIGNS, EMPLOYEES OR USERS (WHETHER AUTHORIZED OR UNAUTHORIZED) FOR ANY INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES OR DAMAGES, LOSSES OR EXPENSES FOR ANY PERSONAL INJURIES, PROPERTY LOSSES OR ECONOMIC LOSSES ARISING DIRECTLY OR INDIRECTLY FROM ANY ALLEGED BREACH OF WARRANTY, BREACH OF CONTRACT OR ANY ACT, USE OR OMISSION OF ANY PERSON, TORTIOUS OR OTHERWISE, INCLUDING BUT NOT LIMITED TO NEGLIGENCE, GROSS NEGLIGENCE, STRICT LIABILITY AND PRODUCT LIABILITY, WHETHER AT LAW OR EQUITY. BUYER HEREBY RELEASES AND DISCHARGES HYDROPHASE AND ITS MANAGERS, MEMBERS, OFFICERS, AGENTS, EMPLOYEES AND DEALERS FROM ANY LIABILITY, UNDER ANY CIRCUMSTANCE OR THEORY OF LAW, RELATING TO OR ARISING OUT OF THE SALE OR USE OF THE PRODUCT IN EXCESS OF THE PURCHASE PRICE OF THE PRODUCT ACTUALLY PAID BY BUYER.
- 6. Limited Warranty.** The Product and all of the Product's component parts are subject to the terms of the Limited Warranty attached hereto as Exhibit A and incorporated into this Agreement for all purposes.
- 7. ASSUMPTION OF RISK.** BY PURCHASING AND USING THE PRODUCT, YOU EXPRESSLY AGREE TO ASSUME ALL RISKS, DANGERS, CLAIMS AND LOSSES RELATING TO, OR ARISING OUT OF, THE USE OF THE PRODUCT, WHETHER OCCURRING PRIOR TO, DURING, OR SUBSEQUENT TO SUCH USE, WHETHER DIRECTLY OR INDIRECTLY CONNECTED TO SUCH USE, AND WHETHER CAUSED BY ANY PERSON'S NEGLIGENCE, GROSS NEGLIGENCE, OR INTENTIONAL CONDUCT.
- 8. Governing Law.** The Parties agree and acknowledge that the transactions that are the subject matter of this Agreement bear a reasonable relation to the State of Texas and agree that this Agreement shall be construed and enforced in accordance with and governed by the laws of the State of Texas without regard to the conflict of law principles thereof.
- 9. Integrated Agreement.** The terms of this Agreement are intended by the Parties as the complete and final expression of their agreements concerning the transactions contemplated herein. This Agreement supersedes any and all previous oral or written agreements between the Parties concerning the transactions contemplated herein, and this Agreement shall not be modified by any prior or contemporaneous oral or written agreements between the Parties. This Agreement may not be modified or amended except by a written agreement executed by both Parties.
- 10. Severability.** The invalidity or unenforceability of any provision of this Agreement shall not invalidate or affect the enforceability of any other provision of this Agreement.
- 11. Successors and Assigns.** This Agreement shall be binding upon and shall inure to the benefit of the Parties and their respective successors and assigns.
- 12. Waiver.** No delay in the exercise of any right under this Agreement shall waive such rights. Any waiver, to be enforceable, must be in writing.
- 13. Counterparts.** This Agreement may be executed in multiple counterparts, each of which shall have the force and effect of an original, and all of which shall constitute one and the same agreement.
- 14. Digital Signature.** You hereby expressly agree by clicking "I AGREE" below, You acknowledge and agree to all of the terms of this Agreement, and You further agree that You have "signed" the Agreement for the purposes of, and as defined in, Section 2.108 of the Texas Business and Commerce Code.

Exhibit A – Limited Warranty

Exhibit A

LIMITED ONE-YEAR WARRANTY

HYDROPHASE, LLC, a Texas limited liability company ("Hydrophase"), makes the following Limited Warranty with respect to the product(s) manufactured and sold by Hydrophase (collectively, the "Product").

1. Hydrophase warrants the Product to be free from defects in workmanship and materials for a period of one (1) year after the date of purchase.

2. FOR BREACH OF ANY WRITTEN OR IMPLIED WARRANTY ON THIS PRODUCT, THE CONSUMER IS LIMITED TO DAMAGES EQUAL TO THE PURCHASE PRICE OF THE PRODUCT, AND ALL OTHER DAMAGES, INCLUDING INCIDENTAL OR CONSEQUENTIAL DAMAGES, ARE EXCLUDED.

NOTE: SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

3. This Limited Warranty extends exclusively to the original purchaser of the Product, and subsequent purchasers are not covered by this Limited Warranty.

4. This Limited Warranty covers the Product and each of its component parts.

5. This Limited Warranty is void if the Product (1) is not installed and operated according to the installation and operating instructions provided, or (2) the defect, malfunction or other failure of the Product results from (a) improper or negligent operation of the Product, or (b) misuse of or damage to the Product while in the purchaser's possession, or (c) water damage.

6. In the event of a defect, malfunction, or other failure of the Product to which the Limited Warranty applies, Hydrophase will remedy the failure or defect, without charge to the purchaser, within a reasonable amount of time after the Product is returned to Hydrophase. The remedy will consist of repair or replacement of the Product OR a refund of the purchase price, at Hydrophase's sole and exclusive option and discretion. This Limited Warranty does not include or cover any costs required to disassemble, remove, ship, or re-install the Product.

7. If the Product or one of its component parts contains a defect or malfunction to which the Limited Warranty applies, after a reasonable number of unsuccessful attempts to remedy the defect or malfunction, the purchaser shall be entitled to a refund or replacement of the Product or its component part(s), at the election of the purchaser.

8. The term of this Limited Warranty begins on the date of purchase and continues for a period of one (1) year thereafter.

9. To obtain performance of any obligation of Hydrophase under this Limited Warranty, Buyer shall contact Hydrophase for a RMA number and securely pack the Product and ship the Product, with the RMA written on the outside of the package, to:

Hydrophase, LLC
RMA: _____
13729 Research Blvd.
Suite 610-209
Austin, Texas 78750

10. To obtain information about this Limited Warranty or Hydrophase's performance under this Limited Warranty, the purchaser may call +1 512-524-8686.

11. If a dispute arises over the terms of this Limited Warranty or Hydrophase's performance hereunder, either Hydrophase or the purchaser may submit the dispute to a qualified mediator in Austin, Texas.

12. This Limited Warranty gives the purchaser specific legal rights, and the purchaser may also have other rights that vary from state to state.

13. Other than as expressly set forth in this Limited Warranty, Hydrophase makes no other express warranty, and no affirmation of Hydrophase, by words or action, shall constitute a warranty.

DISCLAIMER OF ALL IMPLIED WARRANTIES

THE PRODUCT(S) DESCRIBED IN THIS LIMITED WARRANTY ARE SOLD ON AN "AS IS" AND "WITH ALL FAULTS" BASIS, AND HYDROPHASE DISCLAIMS ANY AND ALL IMPLIED WARRANTIES WITH RESPECT TO THE PRODUCT, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE.