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2 Package Contents

Package contents: items may appear slightly different than shown.



Display / keypad



[Optional] Thru-hull paddlewheel sensor
w/ install kit and instructions



CPU



RPM sensor cable



Throttle motor assembly with control cable



GPS assembly

Package Contents 3



Power cable



Throttle motor power cable



[Optional] Air temp sensor



[Optional] Water temp sensor



L-bracket:
small and
big hole

L-bracket:
2 big holes



Cable guide



Flat brackets with small and big holes



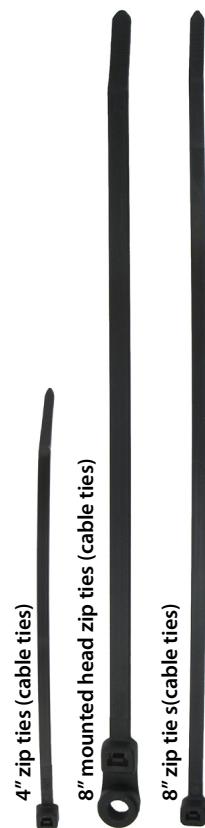
10-32 K-lock nut x4

1/4" washer x6

#6 wood screw x2



Tap connectors



4" zip ties (cable ties)

8" mounted head zip ties (cable ties)

8" zip ties (cable ties)

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 performance, easy-to-use operation.

GPS, paddlewheel, or RPM-based control

The Ridesteady speed control system uses information from satellite-based "Global Positioning System" (GPS) and "Global Navigation Satellite System" (GLONASS) to control the boat speed. The dual, simultaneous use of both GPS and GLONASS systems allow for unprecedented precision and control.

The optional through-hull paddlewheel allows for "speed-over-water" operation, useful on flowing rivers. The Ridesteady speed control may be set to use the paddlewheel for speed control, or it can be set to use the paddlewheel for the speed display, while using the GPS or RPM for speed control.

RPM-based control allows for super-smooth operation, particularly useful for slalom skiers at higher speeds, or for cruising in particularly choppy water.

Ease-of-use

The Ridesteady user interface provides an experience unmatched in the industry. We use a high resolution, weather and splash-proof optical rotary encoder to provide incredibly fast and easy adjustments. 50 custom user-profiles allows you to dial-in your speed, pull, and control-method preferences, and saves your day and all-time "Ridestats".

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.

Throttle reduction technology

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

Timed-standby

The industry-first timed-standby keeps the GPS active, while turning OFF the LCD backlight and throttle motor when the ignition switch is OFF. This keeps the power consumption low while continuing to track satellites, allowing for instant restart. It also displays GPS time, air and water temps, battery voltage, and elapsed and remaining time.

Ridestats™

"Ridestats" track the user's current ride-time, day ride-time, and all-time ride-time. It also displays the percentage of ride-time compared to all other users for the day, and all-time. Use this feature to promote ride-time fairness, gas sharing, training time, or just-for-fun.

Air and water temperature

The optional air and water sensors display real-time temperatures. It is possible to mount the sensors without drilling a single hole. The optional paddlewheel has the water temperature sensor built-in.

GPS-based compass

The GPS-based compass presents your heading in real-time in an easy-to-read graphical format.

Installation process

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 listed in this manual, you should seek the service of a qualified boat technician.

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) Install throttle return spring (if applicable)
- 4) Mount display
- 5) Connect RPM sensor cable
- 6) Mount GPS receiver
- 7) Mount [optional] temperature sensors
- 8) Connect power and mount CPU
- 9) Install [optional] paddlewheel
- 10) 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.

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.

- Remove (untwist) the white protective tubing from end of control cable prior to installation and discard.
- 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 before each day on the water to ensure proper operation (including checking all fasteners for retention and checking the control cable's inner stainless cable of the control cable for damage).
- Visit www.hydrophase.com to download this instruction manual in PDF form with full color pictures.

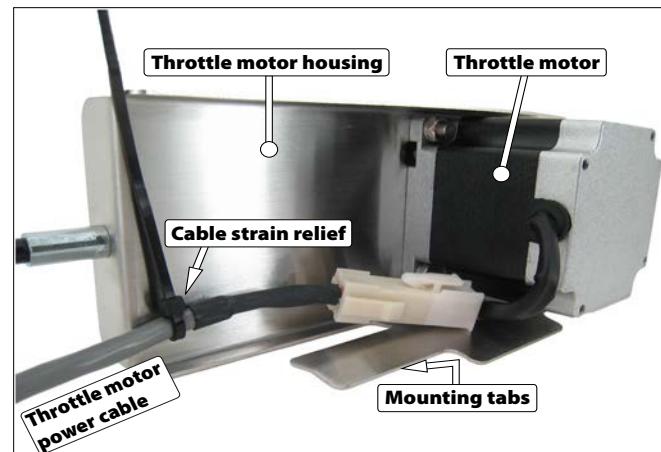


Figure 5-1: Throttle motor housing (back) showing throttle motor power cable connection and strain relief. Actual connectors may be different than shown. Make sure to fully latch connectors.

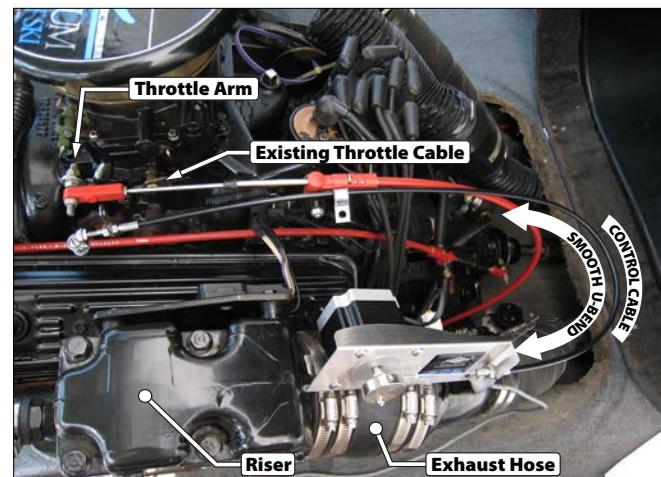


Figure 5-2: Throttle motor housing mounted on exhaust hose, showing control cable temporarily placed near existing throttle cable with end near throttle arm (note smooth U-bend in cable)

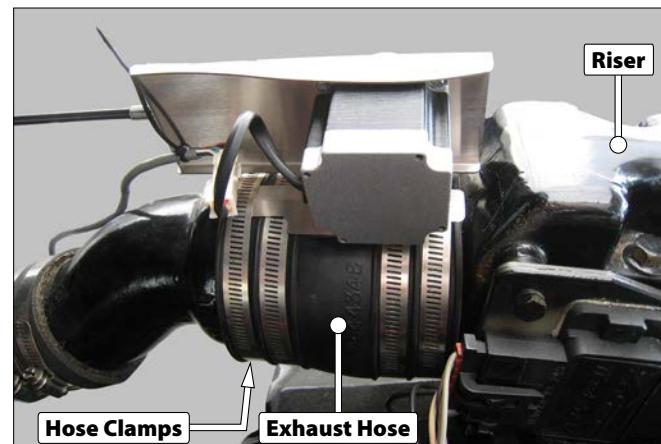
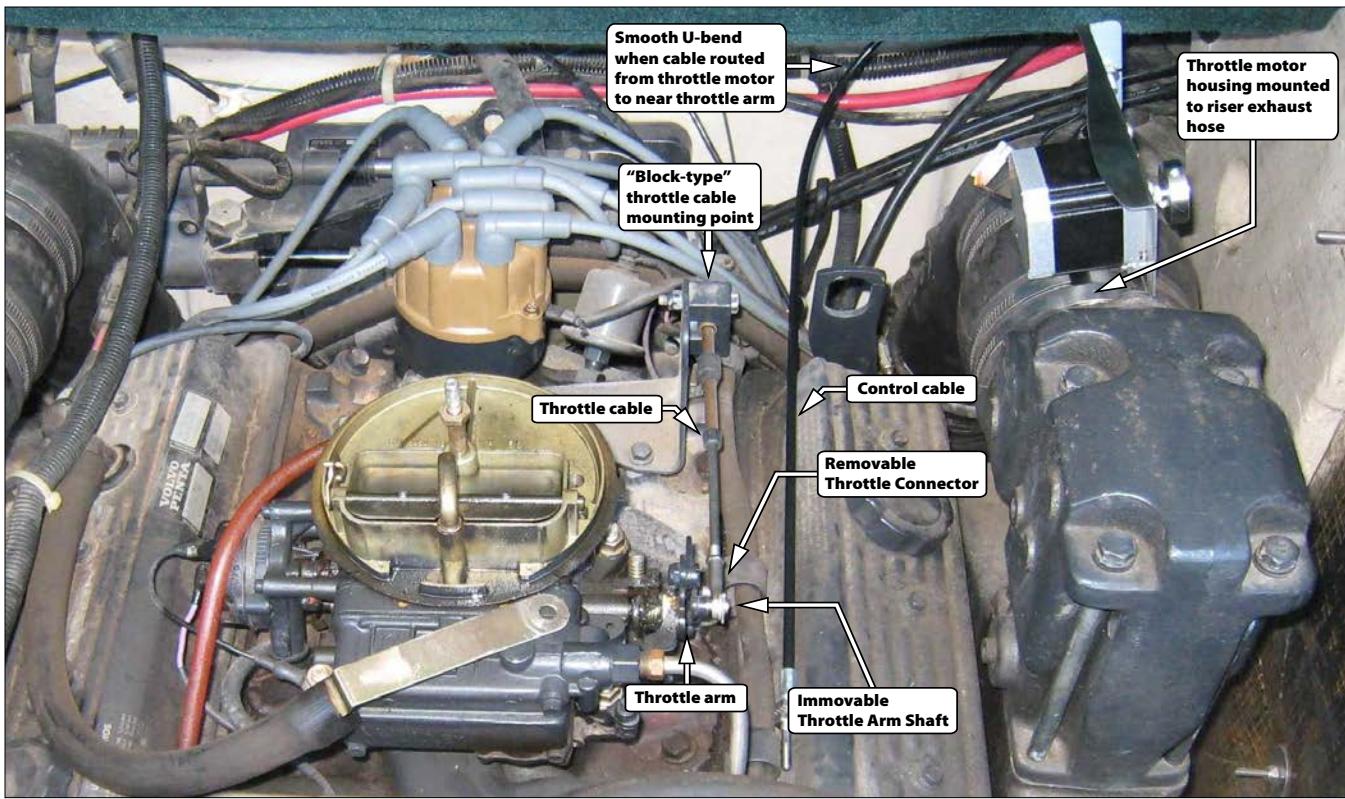


Figure 5-3: Throttle motor housing mounted on exhaust hose. Mounting tabs secured by exhaust hose clamps.

6 Control Cable Install

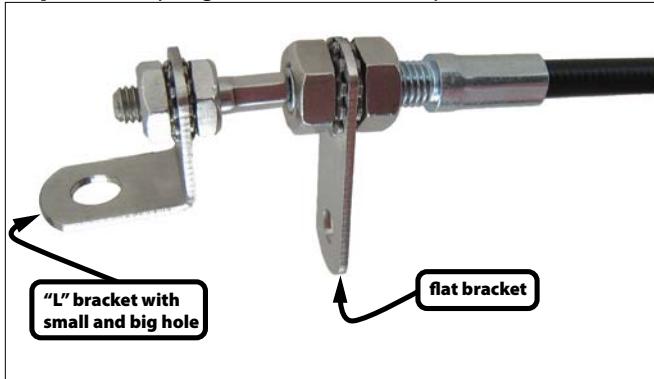
Engines with removable throttle connectors (eye connector), immovable throttle arm shaft, and "block-type" throttle cable mounting point (common on Volvo-Penta engines)



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.



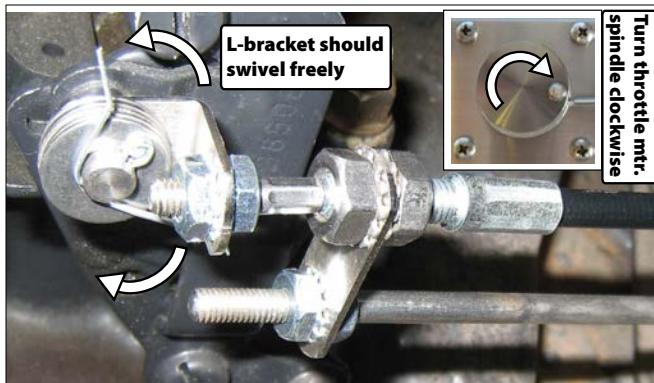
Step 3 Assemble the control cable connection as shown using the parts supplied. Hand tighten. Try using the longer flat bracket first; the shorter bracket may also be tried for better alignment.



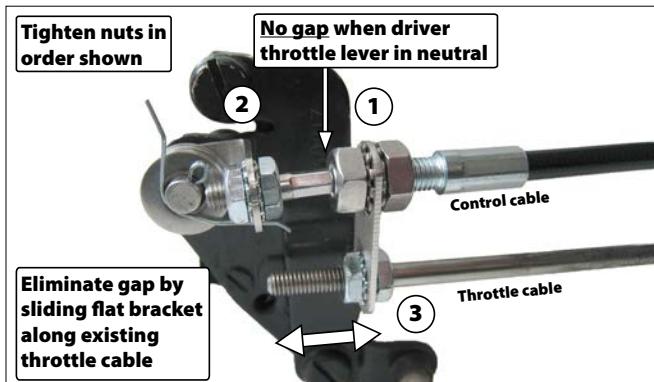
Step 4 Install the control cable onto the existing throttle cable using two K-lock nuts as shown. Place the L-bracket onto the throttle arm shaft as shown. NOTE: Moving the driver throttle lever about half way down may help with clearance.

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

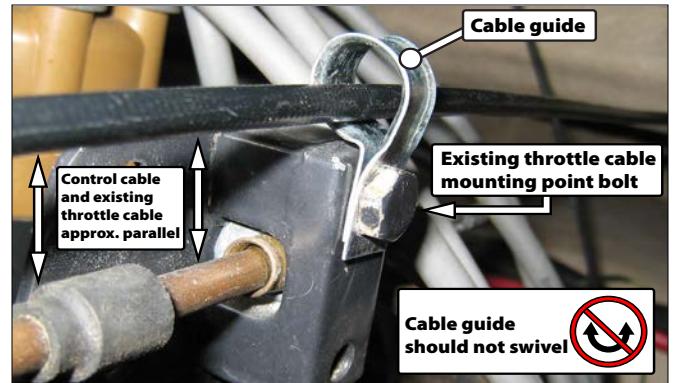
Control Cable Install 7



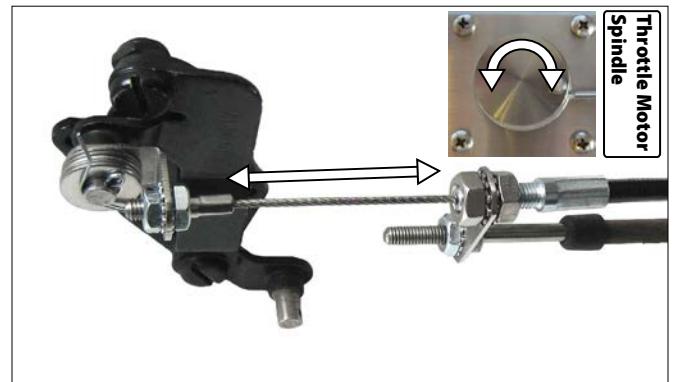
Step 5 Slowly return driver throttle lever to "neutral" position (if previously moved). Turn throttle motor spindle clockwise to wind up any slack in the cable. Add washers (typically 4 to 5) to throttle arm shaft as shown and replace with new cotter pin (not included). L-shaped bracket should be snug,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



Step 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 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 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.

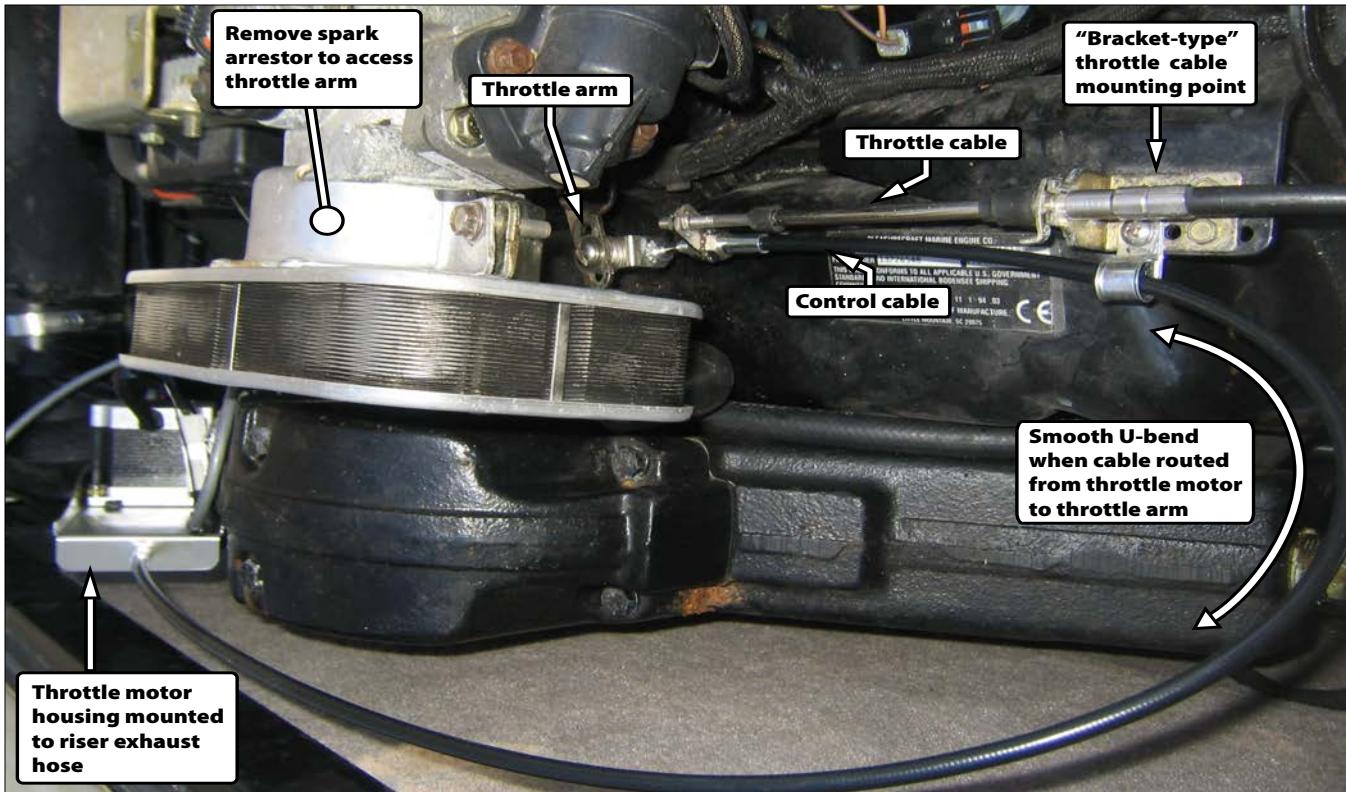


Step 9 Finished control cable installation should look similar to the picture above. The control cable should be approximately parallel to the existing throttle cable from the cable guide to the throttle arm. To align, loosen throttle / control cable nuts, align cable, then re-tighten nuts. Replace the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

Continue on page 12 →

8 Control Cable Install

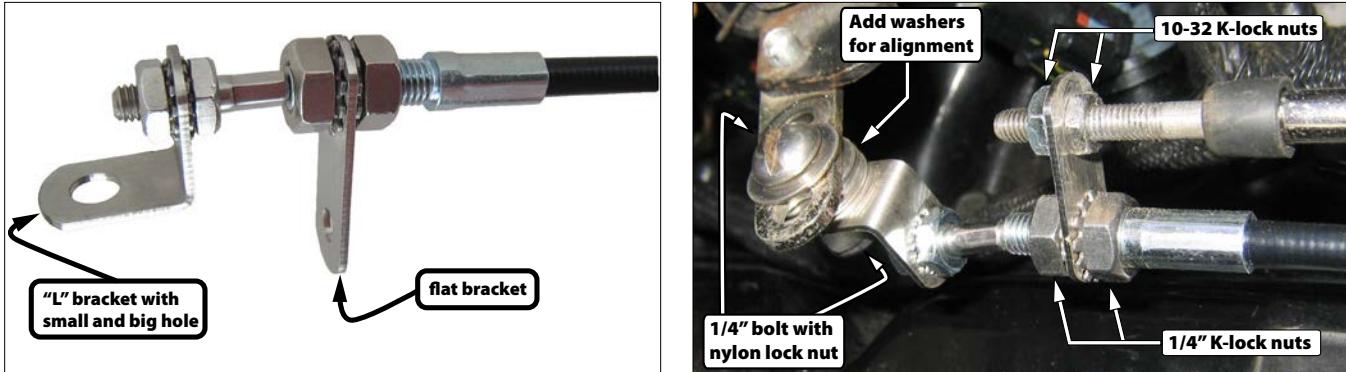
Engines with removable throttle connector, removable throttle arm shaft and "bracket-type" throttle cable mounting point (some inboards / V-drives - common on PCM engines)



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.

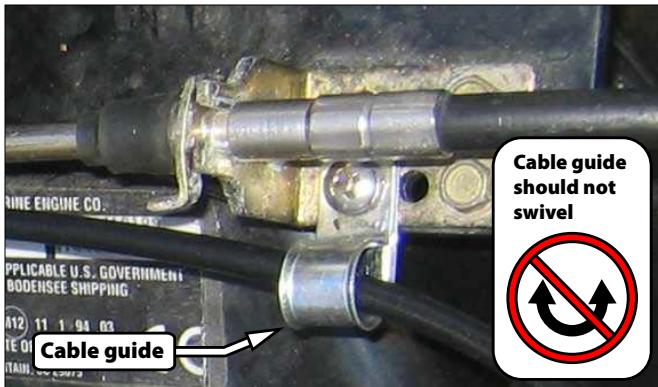


Step 2 Side/Top Engine View Remove the quick release connector from existing throttle cable. Remove quick release ball from throttle arm.

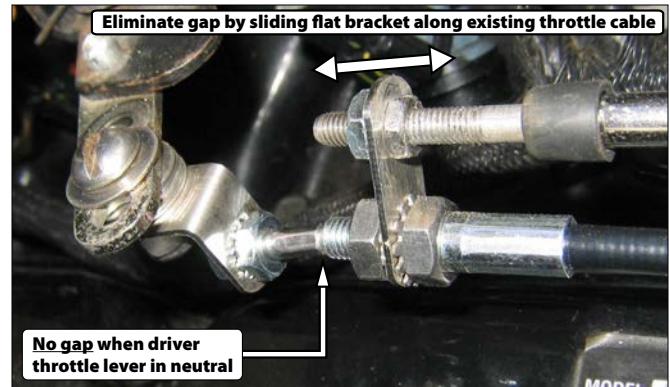


Step 3 Assemble the control cable connection as shown using the parts supplied. Hand tighten. Try using the longer flat bracket first; the shorter bracket may also be tried for better alignment.

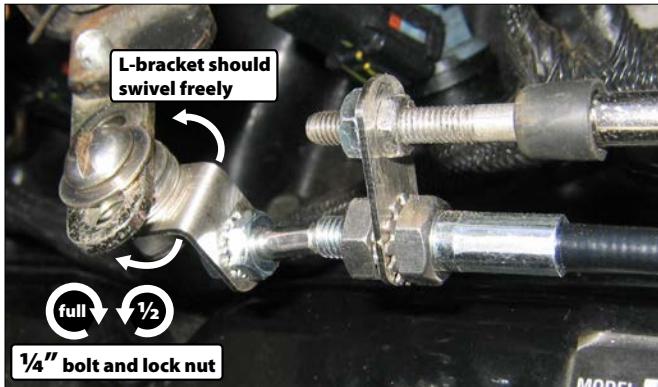
Step 4 Install the control cable onto the existing throttle cable and throttle arm as shown using the parts supplied. Add washers as needed between throttle arm and L-bracket for better cable alignment. Hand tighten. NOTE: In some cases, the existing quick release connector may be used instead of the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



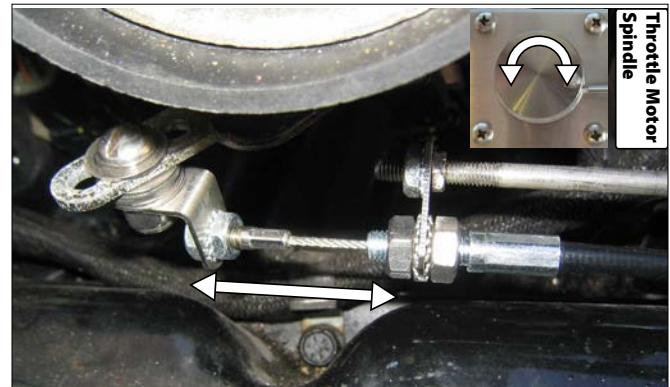
Step 5 Install cable guide onto existing throttle cable bracket as shown using the 10-32 x 1/2" bolt and nylon lock nut provided. Tighten with pliers and screwdriver enough that the cable guide will not move as the cable passes through it.



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.



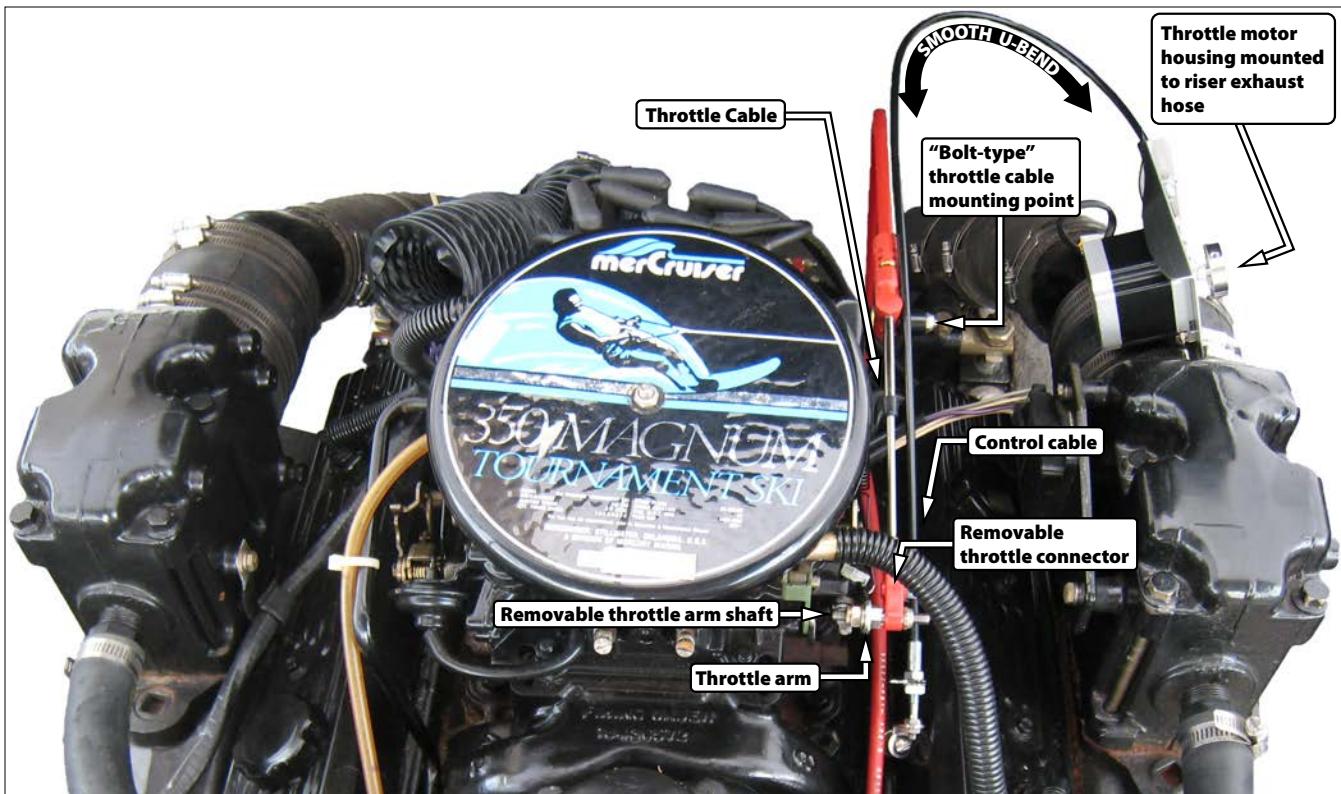
Step 8 Move the driver throttle lever to full open and back to neutral to confirm the control cable moves freely without interference. Then, with the driver throttle lever half way down, rotate the throttle motor spindle and confirm the throttle arm moves back and forth freely as shown.



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

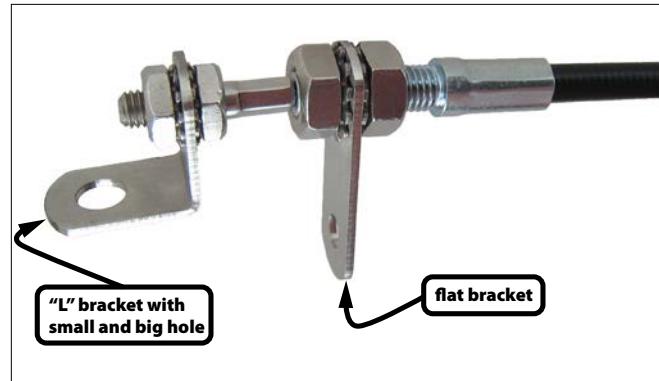
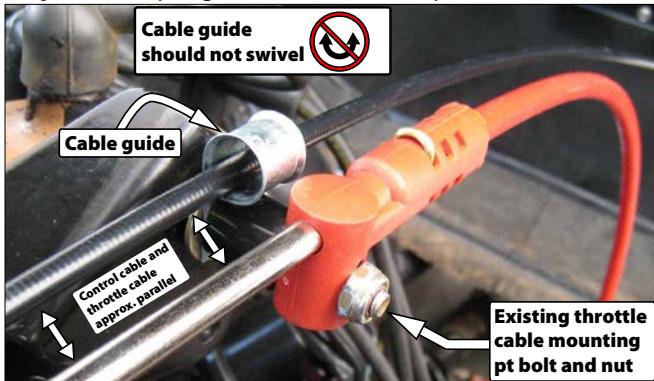
Engines with removable throttle connector, removable throttle arm shaft and "bolt-type" throttle cable mounting point (some inboards / V-drives / I/Os)



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.

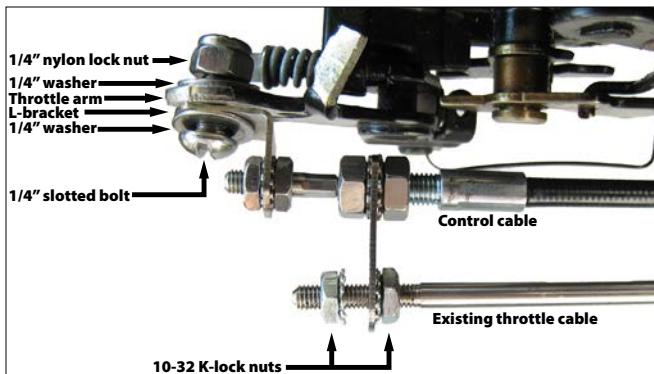


Step 2 Side/Top Engine View Remove the parts as shown.



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.

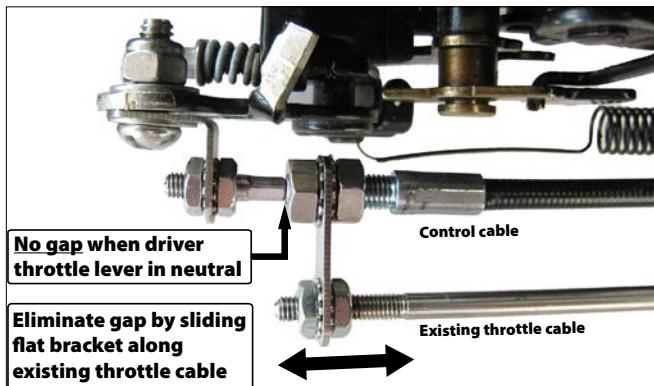
Step 4 Assemble the control cable connection as shown using the parts supplied. Hand tighten. Try using the longer flat bracket first; the shorter bracket may also be tried for better alignment.



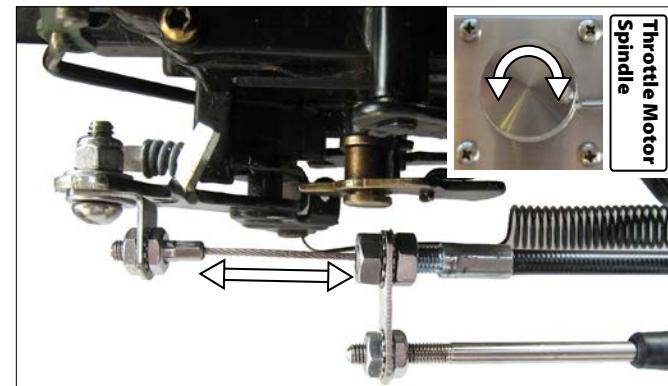
Step 5 Top View Install the control cable onto the existing throttle cable and throttle arm as shown. Use two K-lock nuts to secure the flat bracket to the existing throttle cable. Use the 1/4" bolt, two 1/4" washers, and nylon lock nut to secure the L-bracket to the throttle arm. Hand tighten. **NOTE:**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



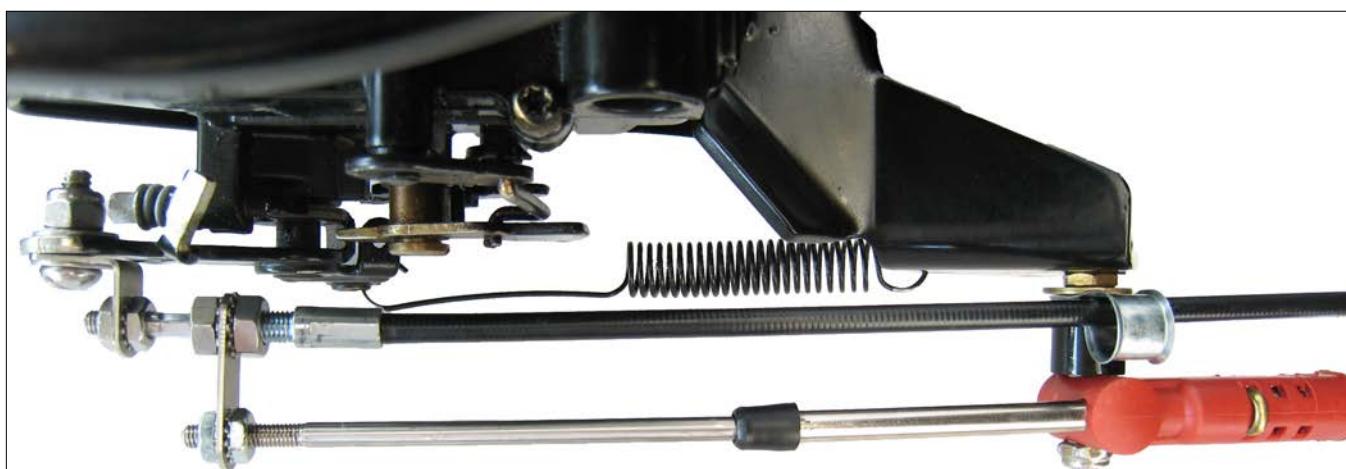
Step 6 Tighten the 1/4" slotted bolt and nylon lock nut fully with screwdriver and pliers then un-tighten 1/2 turn. L-bracket should be snug but able to swivel freely on the throttle arm.



Step 7 Slowly return driver throttle lever to "neutral" position, if previously moved (if you have a Morse-type lever, move 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 Throttle Return Spring Install for 4.3L and 5.0L Mercruiser Carbureted Engines



Figure 12-1: Linear throttle return spring on Mercruiser 5.7L engine

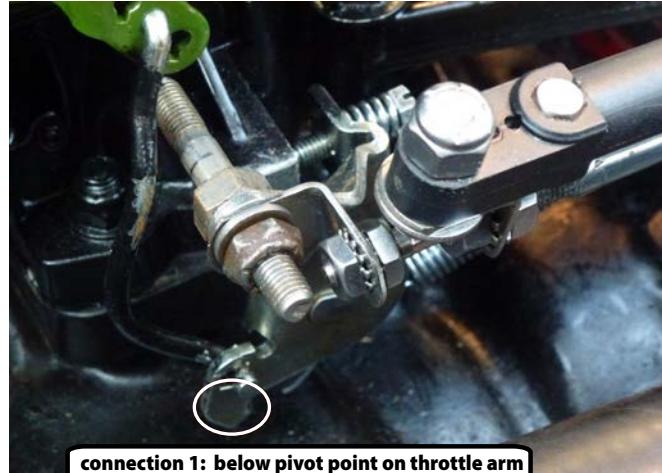


Figure 12-3: Throttle return spring connection 1 (on 'tab' on opposite side of oval, under pivot point of throttle arm)



Figure 12-2: Coiled throttle return spring on Mercruiser 4.3L MPI engine

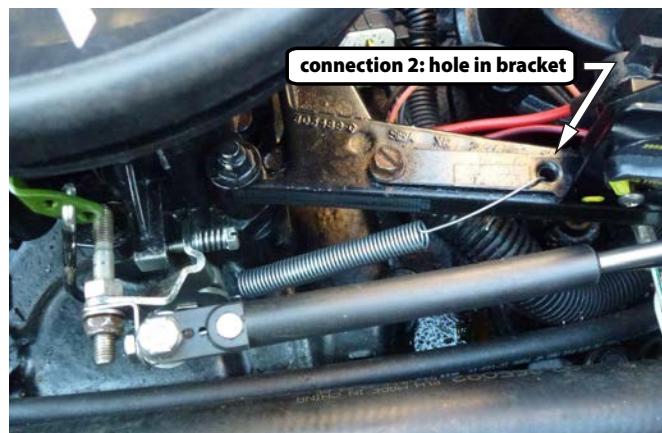


Figure 12-4: Throttle return spring connection 2 (through hole in throttle cable bracket)

3) Install throttle return spring (if applicable)

Most marine engines have a throttle return spring assembled to the carburetor or throttle body to bias the throttle to close. Some are easy-to-locate "linear" springs while others are less obvious "coiled" springs.

However, many recent Mercruiser 4.3L and 5.0L carbureted engines (including TKS - turn key start) have inadequate throttle return force. These engines often require a throttle return spring be added in order for Ridesteady to work properly. If you have a different engine, (including Mercruiser 5.7L and MPI engines), this step may be skipped.

The easiest way to determine whether your engine has a throttle return spring or not is to locate it visually. It will typically either be a long linear spring connected to the throttle arm on one side and a fixed location on the other, or a coiled spring on the inside of the throttle arm (see figures 12-1 and 12-2 above).

If you're unable to locate a throttle return spring, and you have a Mercruiser carbureted 4.3L or 5.0L engine, we suggest adding one.

1. Use the loop on the end of the spring to attach to the throttle arm below the pivot point (see figure 12-3). If the loop is able to slip off the throttle arm too easily, it may be "unwound" and/or cut with pliers so that it may be bent securely around the throttle arm below the pivot point.

2. On the opposite end of the spring, bend a "hook" with pliers to attach to a remote point that allows the spring to bias the throttle arm to close (typically there is a hole in the bracket that holds the throttle cable that is well suited for this purpose - see figure 12-4). **NOTE:** When attaching the spring from the throttle arm to a remote point (i.e. throttle bracket), the spring length should be adjusted so that it has slight tension on it when the throttle arm is in the "idle" position.

3. After the remainder of the Ridesteady system is installed in upcoming steps, return to verify the spring operates smoothly and without obstruction. With the speed control ON (powered), watch the throttle arm and spring while an assistant moves the driver throttle lever forward and back to verify smooth and unobstructed operation.

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14 Display, RPM, GPS, Temperature Sensor Install

IMPORTANT: Avoid sharp edges, hot surfaces, and moving components when routing any wire / cable.

4) 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.

NOTE: If removing a pitot-tube based speedometer, be sure to fold and clamp off the hose (for example with a "zip tie") to prevent water from spraying / leaking out of it.

NOTE: The "window" on the display can be scratched and should only be cleaned with new cloths and cleaning fluid suitable for cleaning camera lenses.

5) Connect the RPM-sensor cable

Connect the Ridesteady RPM-sensor gray wire to the engine RPM signal. The engine RPM signal is a *solid gray* wire that is typically either attached to the back of the tachometer, or leads into a "control box" or connector. If the gray engine RPM wire is attached to the tachometer, you may simply connect the Ridesteady RPM-sensor gray wire to the same mounting post on the tachometer. If the gray engine RPM wire leads into a control box or connector, the wire may need to be "tapped" with the included "tap connector" ([see appendix](#)).

If you have "Medallion" gauges (typical on Mastercraft, Malibu, Sanger, Supreme, Calabria, Hydrodyne, and others from around 2000-2006), although the tachometer has a *gray with black stripe* wire going into it, this is not the RPM signal. The RPM signal is on a *solid gray* wire that is in or around the wiring loom around the black "MDC" box under the dash. It may be attached to a white connector, or may have a spade terminal crimped to it.

After connecting to the engine RPM signal, route the RPM-sensor wire to where the CPU will be located.

IMPORTANT: The engine RPM wire may have high voltages on it. Complete all installation with the ignition switch OFF. Do not touch when the ignition switch is ON.

NOTE: The Ridesteady RPM-sensor can handle a wide-range of engine RPM signals, from traditional tach signals to 5V square-wave signals seen on LT1 and other engines.

6) Mount the GPS receiver

Determine a suitable location for mounting the GPS receiver that will allow an unobstructed "view" of the sky and allow the cable to reach where the CPU will be located. The best position is one where there is nothing between the sky and the GPS receiver. However, mounting the GPS receiver on the "dash" is often the easiest and best location.

Clear or non-metallic-tinted windshields will generally pass GPS signals well. Route the GPS receiver cable underneath the instrument panel "cover" to where the CPU will be located under the dash (see Figure 15-1).

The included 3M VHB tape on the GPS receiver will provide very strong bonding to clean gelcoat. Clean the surface using a 50/50 mix of isopropyl alcohol and water. After the surface has dried, peel the VHB backing off and place at the desired location. Apply pressure.

NOTE: The bottom of the receiver is the side with the two rubber strips. The opposite side should point towards the sky.

7) Mount the [optional] temperature sensors

Air temperature sensor

The air temperature sensor should be located in a cool area shaded from the sun. Typically the best location is underneath the dash, away from any heat-producing devices such as amplifiers. It is recommended to "hang" the temperature sensor from the cable a couple inches (with the included zip-ties) so that the sensor will be influenced primarily by the air temperature. Route the cable to where the CPU will be located.

Water temperature sensor

The water temperature sensor should be mounted on the transom, preferably far away from the exhaust exit of the boat. Clean the residue from the gelcoat using a 50/50 mix of isopropyl alcohol and water. If stronger solvents are needed to clean the residue, finish cleaning using the 50/50 isopropyl alcohol and water solution. After the surface has dried, peel the VHB backing off and place at the desired location. Apply pressure. We recommend waiting 24 hours before putting the boat in the water to give the VHB tape time to cure.

The water temperature sensor cable may be passed through the transom with a 3/16" hole, using a marine sealant to seal the hole. If you have a speedometer pitot tube that is no longer being used, the water temperature sensor cable may be routed through the existing hole (see Figure 15-2).

The water temperature sensor cable comes un-installed in the connector housing to allow for a small hole in the transom. After the cable has been routed through or over the transom, follow the instructions below to insert the contacts of the connector into the housing. Refer to the Figures 15-3, 15-4, and 15-5 for more information.

1. Locate the arrow on the top of the connector
2. Position the WHITE wire contact just inside the right-most connector slot, denoted by the arrow, as shown in Figure 15-3. The small "retention clip" should be oriented downwards.

3. Position the other wire (which may be black) into the adjacent slot, as shown in Figure 15-4. Again, the “retention clip” should be oriented downwards. If there is a third wire, insert it into the third slot.

4. Gently push all the contacts into the connector housing. You may hear a small “click” as the contact’s retention clips fit into place in the small rectangular cutouts on the back of the housing. You should see each retention clip protrude slightly from the rectangular cutouts.

Route the water temperature sensor cable to underneath the dash where the CPU will be located. Locate the wire far away from high-voltage sources such as spark plug wires.



Figure 15-1: GPS receiver mounted on the dash beneath the windshield.



Figure 15-2: Water temperature sensor mounted on transom using existing pitot tube hole



Figure 15-3: Position the white wire just inside the slot on right, denoted by the small arrow (in circle above). The small “retention clip” of the contact should be oriented downwards.



Figure 15-4: Position the other wire into the adjacent slot. If there is a third wire, insert it into the third slot, as shown.

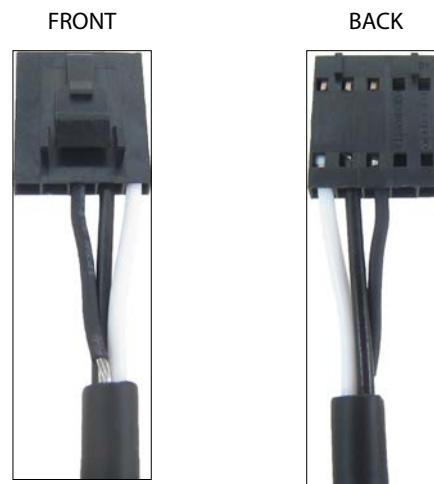


Figure 15-5: Gently push the contacts all the way into the connector housing. The small retention clips should be seen through the top rectangle cutouts on the back of the housing, as shown.

16 CPU Install

8) Connect power and mount the CPU

Refer to the electrical connection diagram on the opposing page. All connections should be made to circuit-protected circuits (through your boat's fused or circuit-breaker-protected circuits). If connecting directly to the battery, an in-line fuse holder with 2A fast-blow fuse should be added to the positive (red) wire at the end of the power cable.

NOTE: The Ridesteady system uses "non-volatile" memory to store the settings and user data--no "battery backup" or connection to "long-term power" (i.e. bilge pump power) is needed.

1. Connect the power cable's 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 or yellow in color) using the included "tap connector" ([see appendix](#)).

2. Connect the power cable's red wire to constant 12V power. The ignition switch typically has constant 12V power going to it, which may be used to connect the red wire. Alternatively, you may connect to a wire with constant 12V power (frequently red or red with purple stripe in color) under the dash with the included "tap connector" ([see appendix](#)). Constant 12V power may be verified with a multimeter or test light.

3. Connect the power cable's white wire to switched 12V power (12V that is "ON" only when the ignition switch (key) is "ON"). Frequently you can connect the white wire to the switched 12V mounting post (sometimes marked "BAT" or "IGN") of one of your existing gauges. Alternatively, the white wire may be connected to an existing switched 12V wire coming from the ignition switch (usually purple in color) using the included "tap connector" ([see appendix](#)). Switched battery voltage may be verified with a multimeter or test light. **IMPORTANT:** Do not connect the white wire to the tach signal (often a solid gray wire)! The tach signal "presents" as a switched 12V signal with a multimeter, but when the engine is started, has 1000V+ spikes and will damage the CPU beyond repair.

4. Connect the power cable's green wire to LIGHTS-switched 12V (12V that is "ON" only when the navigation lights are "ON"). Frequently you can connect the green wire to the LIGHTS-switched mounting post (typically marked "LT" or "LAMP") of one of your existing gauges. Alternatively, the green wire may be connected to the wire going to the lamp of one of your existing gauges (frequently blue in color) using the included "tap connector" ([see appendix](#)). LIGHTS-switched battery voltage may be verified with a multimeter or test light.

5. 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 all cables will reach the CPU before mounting. If using the included wood screws to mount the CPU, only mount to an "inside wall".

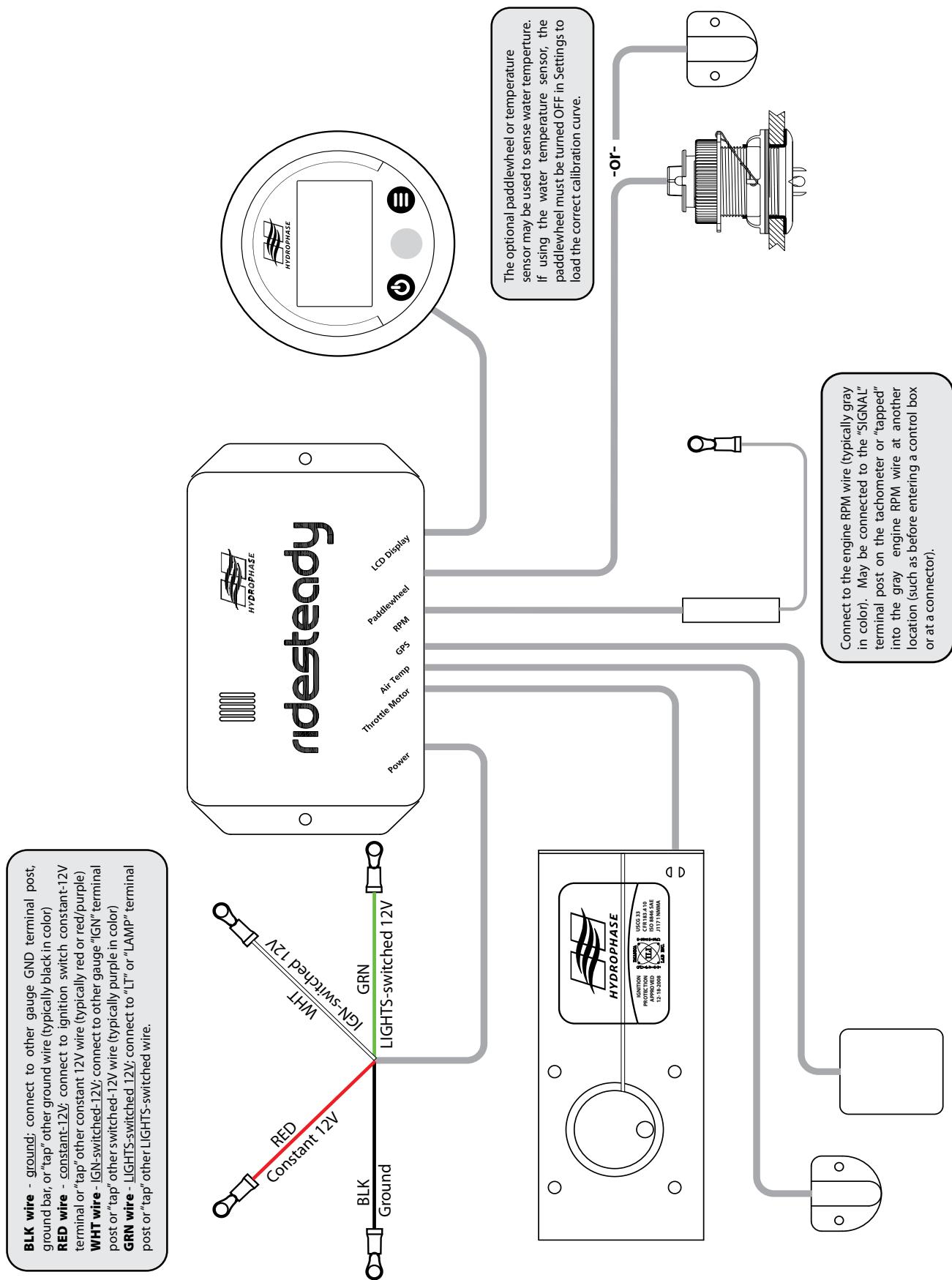
IMPORTANT: When connecting the cables to the CPU (which is completed in step 10), make sure all cables have adequate strain relief as shown in Figure 16-1. Do not hang the CPU by the cables as this may result in damaged wires and void the warranty.

Make sure the wires travel downwards at first after connecting to the CPU, so that if water were to collect on the wires, it would not follow the wires and drip into the CPU.

IMPORTANT: It is important to keep the throttle motor power cable separated from all other cables, except possibly the power cable. The throttle motor power cable has to be routed into the engine compartment, and will sometimes pick up interference from the ignition system. If the throttle motor power cable is "bundled" with other cables, it may cause interference issues with the CPU. Only "bundle" the throttle motor power cable with the power cable.



Figure 16-1: 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. Note the throttle motor power cable is only "bundled" with the power cable.



18 Paddlewheel Install

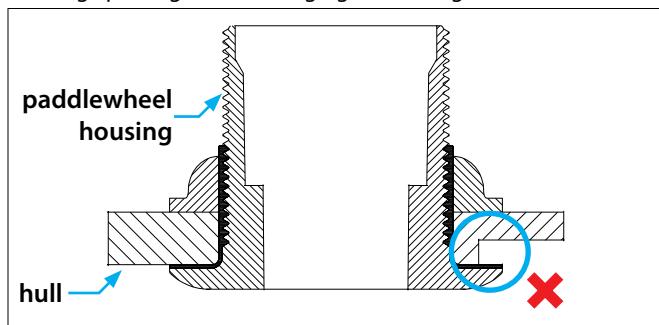
9) Install the [optional] paddlewheel

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 19-1 and 19-2):
 - 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 18-1 and 18-2).

Figure 18-1: 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".



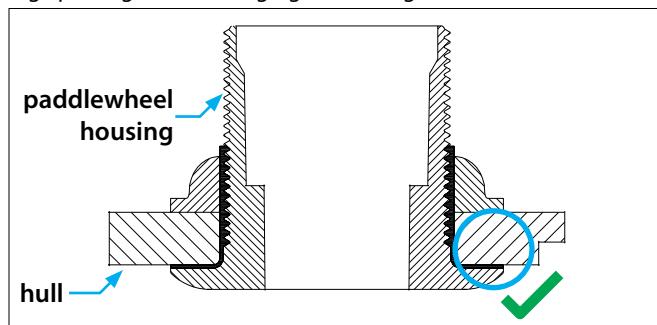
Boat-specific location suggestions

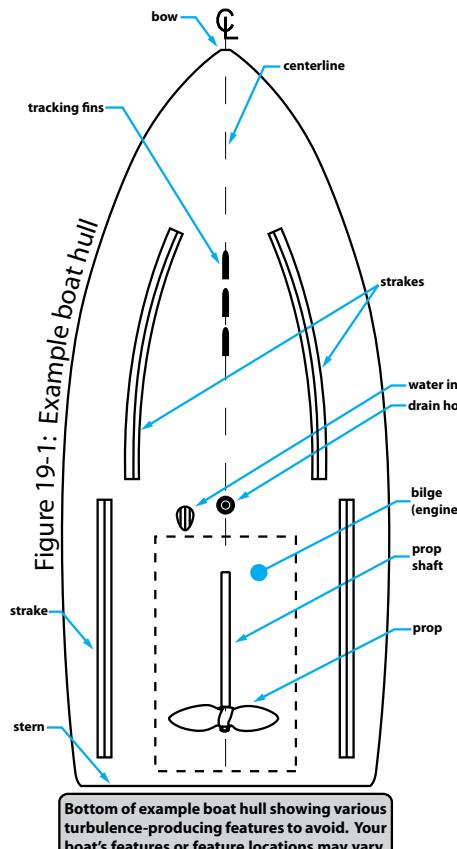
- For V-drive boats, frequently a good mounting location is in the engine bilge in front of or behind the engine, near the centerline, but clear from turbulence-producing features such as tracking fins, etc. (see figure 19-4).
- For inboard boats, frequently a good mounting location is in front of the 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 19-5).
- For I/Q 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 19-6).

General install tips

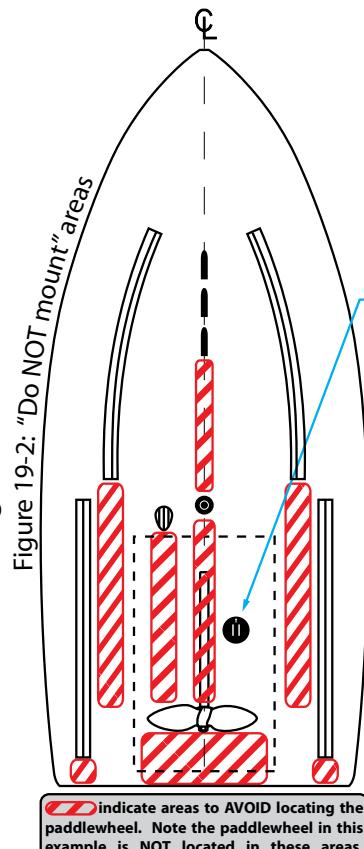
- Drill a small pilot hole from inside the boat to help guide the drilling of the 2" hole from the bottom of the boat. If there is not enough "headroom" for the drill on the inside, drill the pilot hole from outside the boat.
- Use a new, quality hole saw with a drill to make the hole. These can be found 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 19-3).
- 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 18-2: Correct paddlewheel housing installation: 2" hole given enough clearance from hull flat area edge to prevent housing lip (flange) from "hanging off the edge".

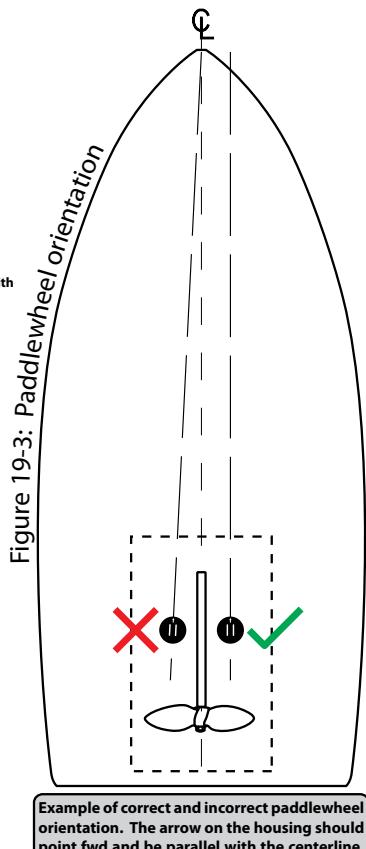




Bottom of example boat hull showing various turbulence-producing features to avoid. Your boat's features or feature locations may vary.



 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.

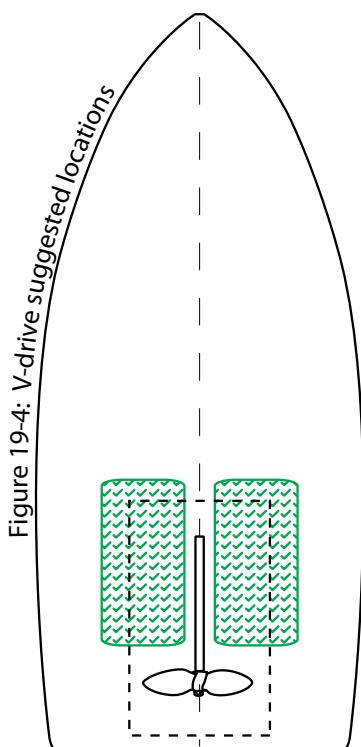


Figure 19-4: V-drive suggested locations

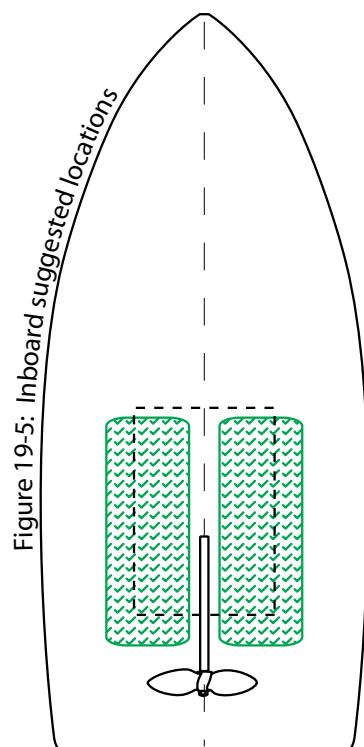


Figure 19-5: Inboard suggested location

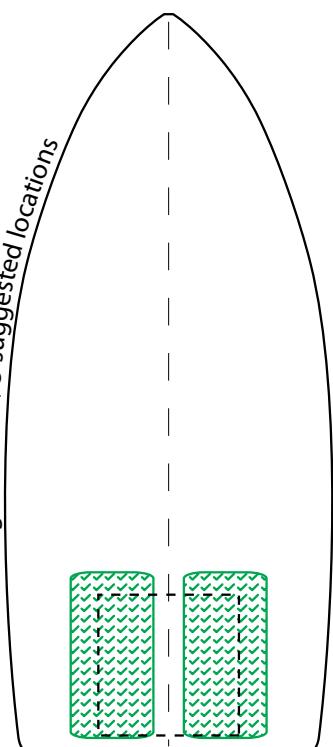


Figure 19-6: I/O suggested locations

indicates 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.

20 Paddlewheel Install Pictures



Figure 20-1: 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 20-2: 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 20-3: 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.

10) Connect the CPU / power test

Connect CPU

1. Run the paddlewheel and throttle motor power cables to under the dash where the CPU is located. Use zip ties as necessary to secure the cables to available mounting points.

IMPORTANT: Route as far away as possible (minimum 6" - preferably 12" or more) from any engine ignition components, such as spark plug wires, distributor, coil, etc., or VHF radio coax cable, etc., as these may induce interference on the paddlewheel and throttle motor power cables. This interference may cause permanent damage to the CPU and is not covered under warranty.

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 (or water temp sensor), RPM, GPS, air temp sensor, throttle motor, and power cables to the CPU.

IMPORTANT: The power cable and throttle motor cable have the same connector. The power cable must not be accidentally plugged into the CPU's "Throttle" connector. If this happens, it will damage the CPU and it must be returned to Hydrophase for repair, even if the ignition key is never switched on!

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 Ridesteady logo and then the main 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. If the throttle return spring was installed previously, also verify it operates smoothly and without obstruction.

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.

Throttle return force test

1. With the engine ignition switch in the "ON" position, move the driver throttle lever from the neutral position to the wide open position (100% throttle).

2. Start the "slow" throttle motor test [SETTINGS->THROTTLE MTR TEST->ROTATE SLOW].

3. Verify that the throttle arm movement precisely tracks the throttle motor movement and that no slack develops on the cord wrapped around the shaft of the throttle motor.

4. Repeat test with "fast" throttle motor test [SETTINGS->THROTTLE MTR TEST -> ROTATE FAST].

If any slack develops on the cord wrapped around the shaft of the throttle motor, the throttle return force is likely not sufficient, and a "throttle return spring" must be added to allow the speed control to work well and avoid control cable damage. Throttle return springs are available through Hydrophase and at most auto parts stores. See [p.12](#) for throttle return spring installation.

IMPORTANT: Be sure the throttle motor has wound-up all the slack before returning the driver throttle lever to neutral, otherwise the inner steel cable may become kinked, thereby needing replacement.

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

The throttle motor is not sealed. No water should be allowed to contact the motor. If there is a risk of bilge water splashing up to the throttle motor, or water seeping in through crevices in the engine cover, a "splash guard" should be constructed to avoid the water touching the motor. Make sure that the water is properly bilged at all times. Water contacting the motor can cause it to "seize", thereby requiring replacement.

If the above tests are 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.

22 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 its 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.

It is recommended to use RPM or PW mode when travelling under or near bridges, as the GPS signal can be temporarily blocked, causing jerky operation or loss of fix.

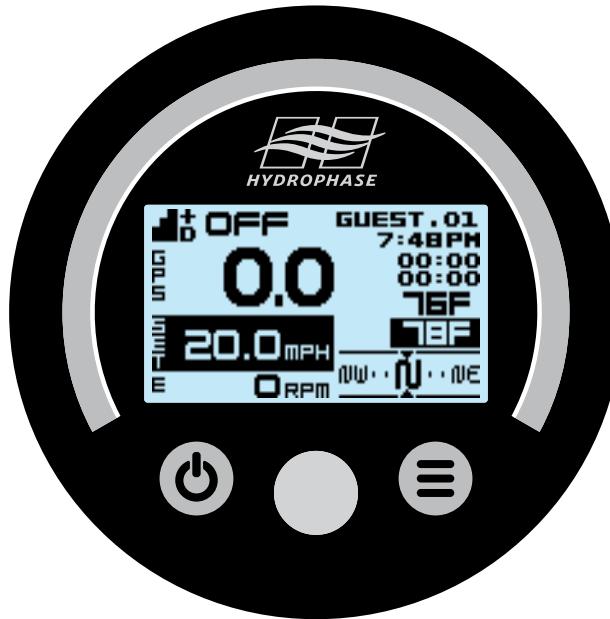
It is not recommended to use any speed control where fluctuations in speed may cause injury. Speed control should not be used with "barefoot booms".

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.

Before each outing, check the control cable (including the inner stainless steel cable) for proper operation and condition. Ensure all fasteners are properly tightened.

Display overview

The Ridesteady speed control system uses a 2 button with rotary / push knob control panel with backlit graphical LCD display.



Button functions:



ON/OFF button

Toggles between manual-throttle (OFF) and speed-control active (GPS, PW, or RPM).



SETTINGS button

Momentary press: moves cursor on main screen
Press and hold: enters / exits SETTINGS mode
(speed must be less than 5 MPH / 8 KPH to enter SETTINGS mode)



Rotary / push knob

Momentary press: "ENTER"; toggles between:
cursor-move mode (cursor blinking)
setting-change mode (cursor solid)

Rotation: cursor-dependent:

in cursor-move mode: changes cursor position
in setting-change mode: changes setting

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. Select user and adjust desired set speed

Move the cursor to highlight the user (if "CURSOR HOME: USER is set, the cursor will already be highlighting the user if below 5 MPH / 8 KPH). Rotate the knob to change the user. This will load the set speed, control mode, response, and overshoot preferences for the selected user. If it is desired to change the set speed, the cursor may be moved to highlight the set speed and adjusted accordingly. The set speed may also be adjusted while the speed control is actively regulating the speed. If "SET SPD SAVE: YES" is set, the adjusted set speed will be saved to the user.

2. Engage the speed control

Press the ON / OFF button to engage the speed control system. The control mode will be displayed. If the control mode is already displayed, the speed control system is already engaged (the speed control system will remember its 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 rotary knob can be used to adjust the set speed during operation. If the "MORE GAS" screen appears, 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. The "THROTTLE RST" screen will appear on the display, counting down until the throttle is back to the original position. The current user's Ridestats will be displayed simultaneously. If the SETTINGS button is pressed, it will extend the throttle reset screen by 5 seconds for each press (max: 10s). 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 OFF appears. 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

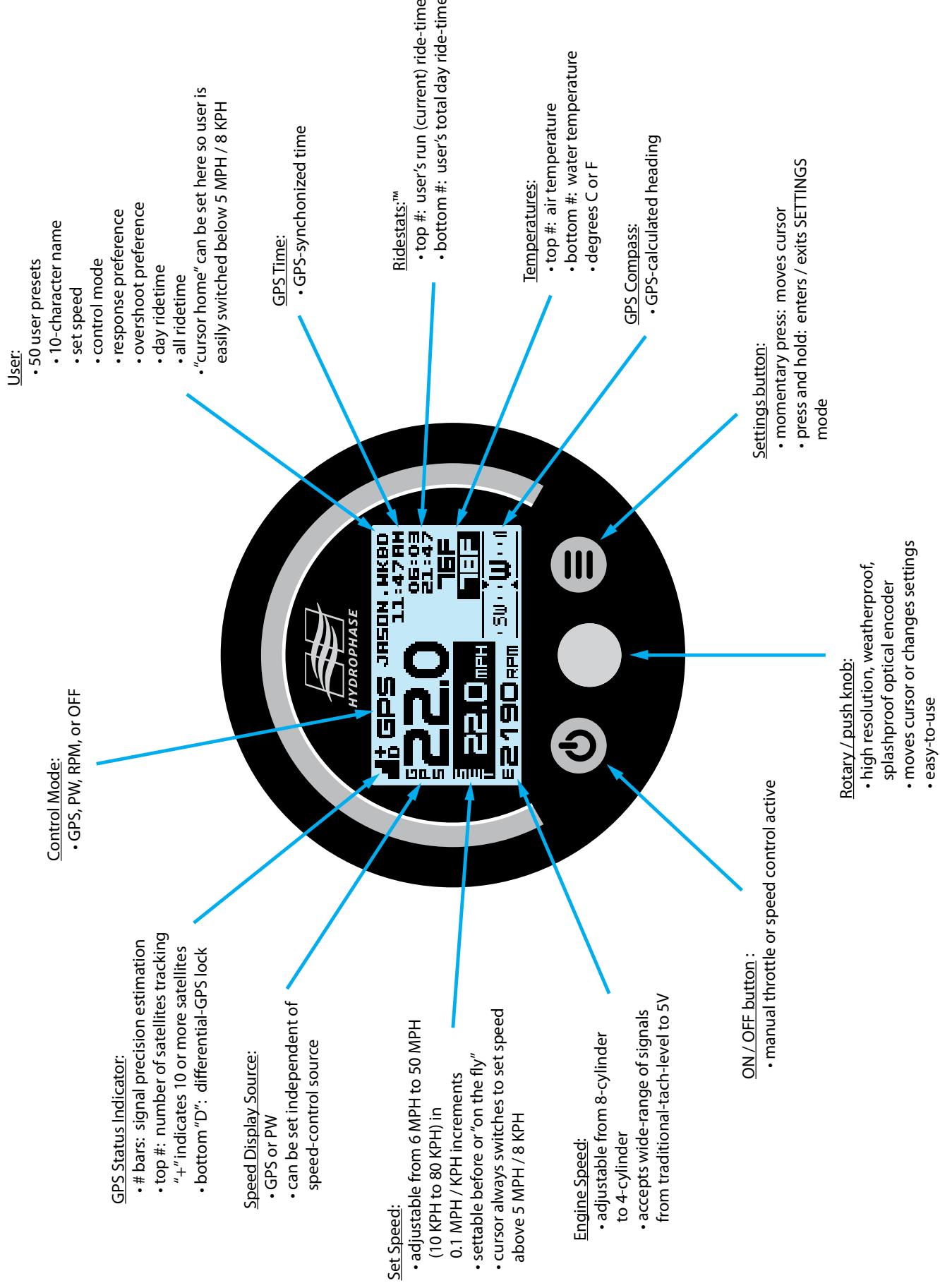
It is only necessary to push the throttle lever down slightly more than is normally necessary to maintain the desired set speed. However, if your throttle lever has a tendency to "pop up" (return to the neutral position) at the speed you're going (or you prefer a full-throttle start), the throttle lever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

If the speed control slows down too much during the initial acceleration, refer to the SETTINGS Menu page for information on how to reduce the "overshoot" setting.

"Pumping" carburetor before engine start

All movement of the throttle lever should be done while the speed control has power (and not in standby mode), including priming of carbureted engines before start. If the throttle lever is moved when the system does not have power, the throttle motor could unwind which could cause the control cable to kink, thereby needing replacement.

24 Operation Guide: Main Screen Overview



Operation Guide: Main Screen

Main Screen - referenced from the previous page



GPS Status Indicator: Provides a quick status of the GPS signal.

The bars indicate an estimation of the quality of the signal. This estimation is based on many variables including the signal strength and geometry of the GPS satellites "visible" to the GPS receiver. 2 to 3 bars will typically give an excellent speed signal and thus an excellent pull.

The top number, denoted as "+" sign here, indicates how many satellites are being used to calculate the speed. The "+" sign indicates 10 or more satellites.

The bottom "D" will appear when the system is using differential-GPS (known as "WAAS" or Wide Area Augmentation System in North America) to improve GPS accuracy. Differential-GPS may not be available in all areas, and is not necessary for speed control operation.



GPS Control Mode: [OFF, GPS, PW, RPM] Shows whether the speed control is active and which speed source is input into the speed control. If OFF is not shown, the speed control is engaged and will regulate the set speed based on the selected control mode.

The ON/OFF button toggles the control mode between OFF and GPS, PW, or RPM. The control mode [GPS, PW, RPM] is determined by the current user. If the cursor is moved to this area, the control mode may be changed directly, which will cause the user to change to a "system user" [SYS.PW, SYS.RPM, SYS.GPS]. System users can be thought of as "temporary" users when you don't want to use a saved user.



Source: [GPS, PW] Shows the current speed based on the selected "speed display source".

Either the GPS or PW may be used to display the speed, independent of the control mode. So, if you wanted to use the GPS for speed control, but know your speed-over-water on a flowing river, you could set "IN GPS MODE, SHOW: PW" in SETTINGS. The default is to display the speed based on the control mode. If RPM is selected, the default is to show the GPS speed.



Set Speed with Speed Units:

Shows the set speed along with the speed units [MPH / KPH]. If the cursor is moved to this area, the set speed may be changed directly. If SETTINGS are set to "SET SPD SAVE: YES", the changed set speed will be saved to the user

profile. If SETTINGS are set to "SET SPD SAVE: NO", the changed set speed will not be saved to the user profile.

E 2190 RPM **Engine Speed:** Shows the engine speed in revolutions per minute (RPM).

JASON . HKBO **User:** Shows the active user. The 50 user profiles contain:

- 10-character name
- set speed
- control mode
- response
- overshoot
- day ride-time (accessed in "Ridestats")
- all ride-time (accessed in "Ridestats")

If SETTINGS are set to "CURSOR HOME: USER", the cursor will automatically move from the set speed to the user below 5 MPH / 8 KPH so that the user is easily changed with a rotation of the knob. Otherwise, the cursor may be moved to this area and the user changed.

The default user names are GUEST.01 through GUEST.50. There are also 3 "system users", SYS.PW, SYS.RPM, SYS.GPS. These users can be accessed by rotating the knob counter-clockwise to the first user (GUEST.01 by default), waiting a second, then continuing to rotate the knob counter-clockwise. This creates a "digital stop" which makes it easy to access the first user without inadvertently going into the system users. The "system users" are provided to allow usage of the speed control without using a saved user.

11:47 AM **GPS Time:** GPS-synchronized time. The timezone and daylight savings time can be changed in SETTINGS.

**06:03
21:47** **Ridestats:**™ The top number shows the user's current ride-time. The bottom number shows the user's total ride-time for the day. The ride-time starts when the set speed has been reached. The day ride-time will automatically be reset at midnight.



Temperatures: The top number shows the air temperature while the bottom number shows the water (lake) temperature. The water temperature is received through either the paddlewheel or the water temperature sensor. If using the water temperature sensor, the paddlewheel must be turned OFF in SETTINGS to load the proper calibration curve.



GPS Compass: GPS-calculated heading shows your "course-over-ground" in graphical form. The compass works at about 5 MPH and above, and may be erratic at speeds less than that. The compass should not be used for life-critical navigation.

26 Operation Guide: Standby Screen

GPS Status Indicator:

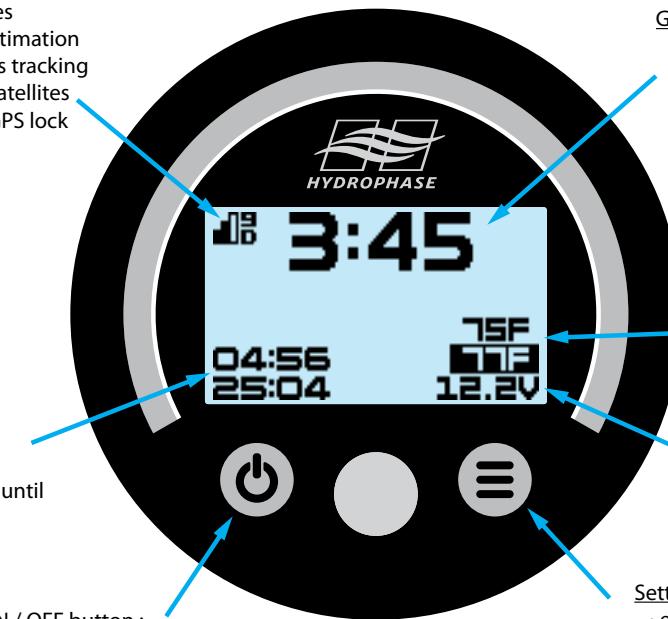
- continues to track satellites
- # bars: signal precision estimation
- top #: number of satellites tracking
“+” indicates 10 or more satellites
- bottom “D”: differential-GPS lock

GPS Time:

- GPS-synchronized time
- Large font for easy boat-wide viewing

Standby Time:

- top: elapsed time
- bottom: time remaining until automatic power kill



Temperatures:

- top #: air temperature
- bottom #: water temperature

Battery Voltage:

- Monitor battery voltage

Settings button:

- extend standby time by 5 minutes per press

Standby Screen - When the ignition SWITCH is turned OFF, the system will enter standby-mode and the “standby screen” will appear (as shown above).

Standby-mode allows the GPS to remain active while turning OFF the throttle motor and LCD backlight (unless the LIGHTS are ON). This allows for continuous satellite tracking for instant restart and useful information display such as the time (in large font), air and water temperatures, battery voltage, and elapsed-time and countdown-time, all in a lower power environment.

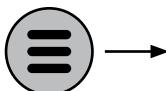
Standby-mode is useful in-between sessions to keep the GPS active and while “anchored”, to keep track of the time, temperature, and battery voltage. It can also be used when trailering to the boat ramp--this way the GPS will be actively tracking satellites by the time the boat is in the water.

Pressing the power button in standby mode will instantly “kill” the power to the system. Pressing the settings button will extend the countdown timer 5 minutes each press, up-to 250 minutes.

The “PWR OFF DELAY” setting may be set from 0 to 250 minutes. If set to 0, when the ignition switch is turned OFF, the system will also turn OFF (it will not enter standby-mode).

When storing the boat, be sure the blue power LED is OFF.

Press & hold
2 seconds when
speed < 5 MPH
/ 8 KPH



Enters / Exits
MENU

SETTINGS

RIDESTATS

USER: 1
NAME: GUEST.01

# RIDES	DAY	ALL
	7	174
TIME	18M	14.5H
RATIO	34.7%	63.1%

USER SET

USER: 1
NAME: GUEST.01
CONTROL MODE: GPS
SET SPEED: 20.0 MPH
RESPONSE: 50
OVERSHOOT: 100%

SYSTEM SET

LCD CONTRAST: 0
LCD BLKT: 100%
LCD BLKT LTS ON: 25%
BEEP VOLUME: 50%
CURSOR HOME: SET SPD
SET SPD SAVE: YES
TIMEZONE: -06 UTC
DAYLT SAVINGS: NO
PWR OFF DELAY: 30 MIN
SPEED UNITS: MPH
PW ENABLED: YES
PW SPEED CAL: 0.0 MPH
TEMP UNITS: DEG F
AIR TEMP CAL: 0.0F
LAKE TEMP CAL: 0.0F
ENGINE CYL: 8 CYL
ENGINE POL: NORMAL
IN GPS MODE, SHOW: GPS
IN RPM MODE, SHOW: GPS
IN PW MODE, SHOW: PW
GPS MODE: NORMAL
NAV SAT: GPS+GLONASS

SYSTEM INFO

SOFTWARE VER.

THROTTLE MTR TEST

STEP EVERY 5 SEC
ROTATE SLOW
ROTATE FAST

FACTORY RESET

USER: 1
NAME: GUEST.01
RESET STAT ABOVE? NO
RESET USER ABOVE? NO
RESET ALL STATS? NO
RESET ALL USERS? NO
RESET SYSTEM? NO
RESET EVERYTHING? NO

SETTINGS menu

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.

Older Ridesteady software versions may not contain all the features listed here.

Use the rotary / push knob to navigate the SETTINGS menu. Each menu will start in either cursor-move mode (cursor blinking) or setting-change mode (cursor solid) for the fastest settings changes. Push the knob to change from cursor-move mode to setting-change mode and back.

Each menu has a “back arrow” icon in the top left corner. Moving the cursor to highlight this arrow and pushing the knob will send the SETTINGS menu back a level.

The menu may be exited at any time by pressing and holding the SETTINGS button.

RIDESTATS Ridestats™ shows the ride statistics of a particular user. The number of rides for the day and all-time, the total time for the day and all-time, and ratio of time versus all other users for the day and all-time are displayed. Use the knob to scroll through the users.

USER SET User Set allows the name, control mode, set speed, response, and overshoot settings to be customized for each user. Use the knob to scroll to the user number you would like to customize. Then highlight the parameter you would like to change.

It is recommended to change the “system users” (users -1, -2, -3) first to a setting that works well for you and your boat. This will become the default setting for all other users with the same control mode. Note that neither the name nor control mode may be changed for the system users.

After changing a user setting and returning to the main screen, it may be necessary to change to a different user and back to refresh the user parameters.

NAME: GUEST.01 Use the knob to change each letter of the user name. Rotating the knob changes the character. Pushing the knob advances the cursor one position. Pressing the SETTINGS button backs up the cursor one position. Rotating the knob completely counterclockwise inserts a ‘space’ character. The name will be right-justified on the main screen, so it is not necessary to

28 Operation Guide: SETTINGS Menu

insert spaces on the left.

CONTROL MODE: GPS Use the knob to change the control mode. GPS, RPM, or PW may be selected. If the paddlewheel is not enabled in System Set, the PW option will not be available.

GPS-mode provides an excellent, precise pull for wakesports from wakeboarding to wakesurfing.

PW-mode (paddlewheel-mode) provides speed-over-water accuracy for those riding on moving bodies-of-water such as rivers.

RPM-mode (engine RPM-mode) delivers a super-smooth pull well-suited to waterskiers, especially slalom skiers at higher speeds.

SET SPEED: 20.0 MPH Adjust the set speed in 0.1 MPH/KPH increments to your preference.

If RPM-mode is selected as the control mode, the set speed will be in terms of engine RPM. In general, each 100 RPM translates to approximately 1 MPH. To set an approximate 30 MPH, start around 3000 RPM.

RESPONSE: 50 Adjust the "response" setting to your preference. Response ranges from 1 to 99.

As response is increased, the Ridesteady speed control becomes more aggressive in how it maintains the set speed. For unladen boats (without many people or much ballast), or for boats with smaller engines, lower numbers deliver a smoother ride. For heavily laden boats, higher numbers will keep a more precise set speed.

OVERSHOOT: 100% Adjust the "overshoot" setting to your preference. Response ranges from 0% (OFF) to 200% (twice the nominal overshoot speed-reduction).

The "overshoot" parameter helps determine how much the boat slows down as it first approaches the set speed. In addition to the overshoot parameter, the amount that the boat slows down is based on other variables, including how quickly the boat is moving towards the set speed and the "response" parameter.

For beginner-riders that require a slower, less aggressive throttle start, a lower overshoot number is recommended. For more experienced riders with a quicker throttle start, or for more heavily laden boats, a higher number is recommended.

SYSTEM SET System Set contains the system settings.

LCD CONTRAST: 0 Adjust the LCD display contrast to your preference. Range -9 to +9.

LCD BLKT: 100% Adjust the LCD backlight to your preference. This backlight setting is for when the ignition switch is ON but the LIGHTS are OFF. Ranges from 0% (OFF) to 100% (fully ON).

LCD BKLT LTS ON: 25% Adjust the LCD backlight to your preference. This backlight setting is for when the LIGHTS are ON. Lower numbers will keep from blinding you with a bright backlight at night. Ranges from 0% (OFF) to 100% (fully ON).

BEEP VOLUME: 50% Adjust the volume of the beeper. Note that the beeper may change pitch as the volume is increased or decreased--this is normal. **IMPORTANT:** Reducing the volume to low levels (such as below 10%) may prevent beeping at all. 0% will turn OFF the beeper completely. Warning beeps will not be heard!

CURSOR HOME: SET SPD Cursor Home changes where the cursor will go on the main screen when the boat slows down to <5 MPH / 8 KPH. It may be set to either "set speed" or "user".

After the set speed has been dialed-in on each user, it is highly recommended to set cursor home to "user". This will allow a mere turn of the knob to change users when the boat slows down, making user changes super fast and convenient.

SET SPD SAVE: YES Set Spd Save determines whether the set speed will be saved to the current user when changed on the main screen. If set to "NO", the changed set speed will only be saved until the user is changed. This allows the set speed to be changed temporarily without disturbing the user profile. If set to "YES", the changed set speed will be updated to the current user profile.

TIMEZONE: -05 UTC Adjust the Timezone to your offset from UTC. This affects both the clock and when a "new day" is defined, thereby resetting the Ridestats for the day.

DAYLT SAVINGS: NO Adjust whether your timezone is in "Daylight Savings Time" or not. This affects both the clock and when a "new day" is defined, thereby resetting the Ridestats for the day.

PWR OFF DELAY: 30 MIN Adjust the time after the ignition key is switched OFF (and the system enters "timed-standby") before the power is killed.

"PWR OFF DELAY" may be set from 0 to 250 minutes. If set to 0, when the ignition switch is turned OFF, the system will also turn OFF (it will not enter timed-standby).

SPEED UNITS: MPH Adjust the speed units to either miles-per-hour or kilometers-per-hour.

PW ENABLED: YES PW Enabled changes the menus to enable or disable the PW control mode. If the paddlewheel was not installed, but the water temperature sensor was, adjust PW Enabled to NO to load the correct calibration curve for the water temperature sensor.

PW SPEED CAL: 0.0 MPH Increase PW Speed Cal if the paddlewheel speed is reading low. Decrease if the paddlewheel speed is reading high. The +/- MPH/KPH number shown is an estimate of how much the paddlewheel speed reading will be changed at 20 MPH.

TEMP UNITS: DEG F Adjust the temperature units to degrees Fahrenheit or Celsius.

AIR TEMP CAL: 0.0F Adjust the calibration of the air temperature sensor. If the temperature sensor is installed in an area that gets warmer than the outside air, adjust the Air Temp Cal down. If the temperature sensor is reading cooler than it should, adjust the Air Temp Cal up.

LAKE TEMP CAL: 0.0F Adjust the calibration of the water temperature sensor. If the temperature sensor is installed in an area that gets warmer than the outside air, adjust the Lake Temp Cal down. If the temperature sensor is reading cooler than it should, adjust the Lake Temp Cal up.

ENGINE CYL: 8 CYL Adjust Engine Cyl to the number of cylinders your engine has. This will allow for the correct engine RPM reading. Also allows for 5, 6, 10, 12 PPR (pulse-per-revolution) setting for alternative engine tachometer configurations.

ENGINE POL: NORMAL Adjust to INVERT if the engine RPM reading is not reading steady. Most of the time this setting will not need to be changed.

IN GPS MODE, SHOW: GPS This setting allows either the GPS or paddlewheel speed to be displayed when in GPS control mode. This is helpful if you're on a river and want to use the GPS for speed control, but want to use the paddlewheel for the speed display.

IN RPM MODE, SHOW: GPS This setting allows either the GPS or paddlewheel speed to be displayed when in RPM control mode.

IN PW MODE, SHOW: PW This setting allows either the GPS or paddlewheel speed to be displayed when in PW control mode.

GPS MODE: NORMAL Adjust the GPS response. This should remain on NORMAL in most cases. AGGRESSIVE mode may experience occasional jerkiness.

NAV SAT: GPS+GLONASS Adjust the navigation satellite system to use either simultaneous GPS and GLONASS or GPS only.

SYSTEM INFO Displays System Information

SOFTWARE VER. Displays the software version.

THROTTLE MTR TEST Allows the throttle motor and connections to be tested. If you experience problems with the speed control not performing as expected, such as slowing down too much and not maintaining the set speed, run through these tests.

STEP EVERY 5 SEC Moves the throttle motor one step every 5 seconds, with a beep each step. Use your thumb and index finger to try to turn the throttle motor spindle at each step. The spindle should be "stiff" and not easy to turn. Make sure the "stiffness" remains for at least two steps (beeps) to test each coil inside the motor. If the throttle motor is not "stiff" during one of the steps, check the connections both at the throttle motor and CPU. Ensure the pins in the connector are correctly "pushed into" the connector housing, especially at the CPU. Press the knob to stop the test.

ROTATE SLOW Moves the throttle motor slowly back-and-forth one-half turn. If the throttle motor spindle vibrates instead of turning properly, check the connections both at the throttle motor and CPU. Ensure the pins in the connector are correctly "pushed into" the connector housing, especially at the CPU. Press the knob to stop the test.

ROTATE FAST Moves the throttle motor back-and-forth one-half turn. If the throttle motor spindle vibrates instead of turning properly, check the connections both at the throttle motor and CPU. Ensure the pins in the connector are correctly "pushed into" the connector housing, especially at the CPU. Press the knob to stop the test.

FACTORY RESET Reset Ridestats, users, system settings, or everything back to factory defaults. Rotate the knob to select the user which will have its stats or settings reset, or move the cursor to select the reset to be performed.

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RESET STAT ABOVE? NO After the desired user to be reset has been selected, changing Reset Stat Above to YES will reset the Ridestats for the user.

RESET USER ABOVE? NO After the desired user to be reset has been selected, changing Reset User Above to YES will reset all attributes of the user, including the Ridestats and user settings.

RESET ALL STATS? NO Changing Reset All Stats to YES will reset the Ridestats for all users.

RESET ALL USERS? NO Changing Reset All Users to YES will reset all attributes for all users, including the Ridestats and user settings.

RESET SYSTEM? NO Changing Reset System to YES will reset all settings in System Set back to factory defaults.

RESET EVERYTHING? NO Changing Reset Everything to YES will reset the entire speed control back to factory defaults.



Figure 31-1: [top view] Horizontal orientation w/quick release connector (not included)



Figure 31-2: [side view] Vertical orientation

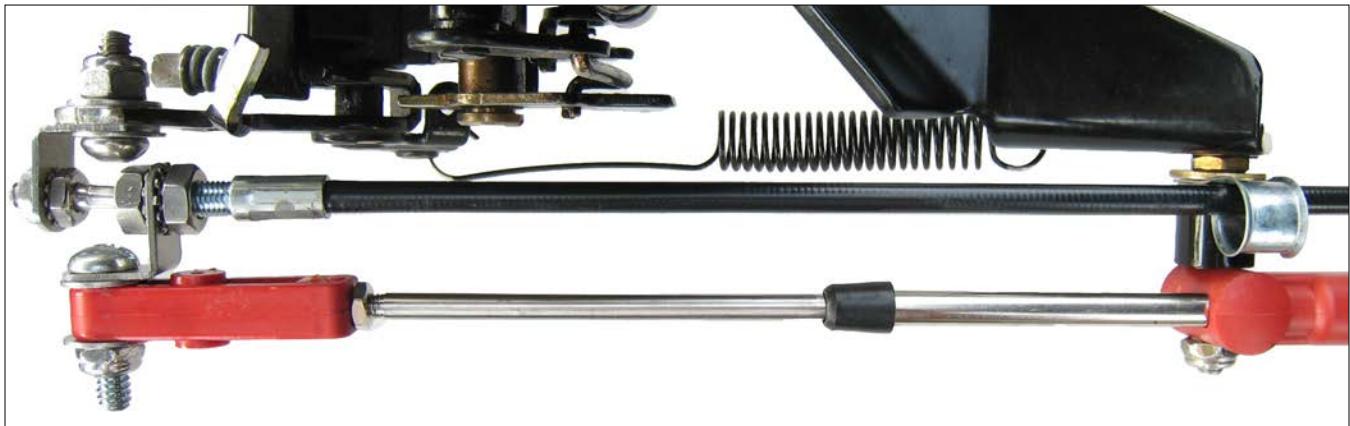


Figure 31-3: [top view] Horizontal orientation keeping original throttle connector attached. A similar connection may be used if your throttle connector does not detach from the throttle cable.



Figure 31-4: [side/top view] Horizontal orientation with existing throttle cable moved back. This is the preferred method for installing on many Mercruiser I/Os. It can also be fitted vertically for engines without the long throttle cable mounting point bolts and spacer.

32 Appendix - Tap Connector Installation

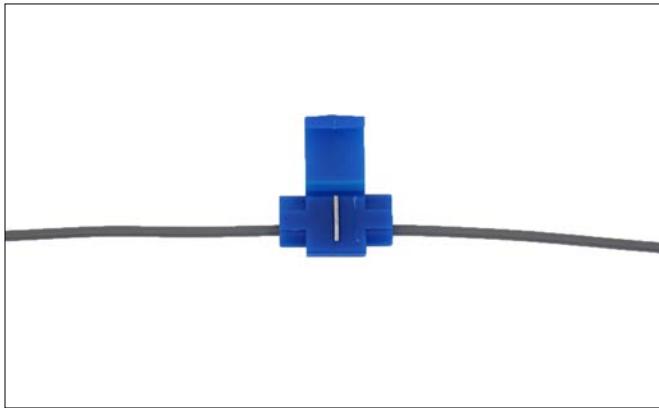
"Tapping" connects two wires using a special "tap connector". This may be used to connect the power or RPM wires to your boat's existing wiring when there isn't a suitable place to connect the attached ring terminal.



1. Cut the ring terminal off the end of the Ridesteady wire to be tapped.



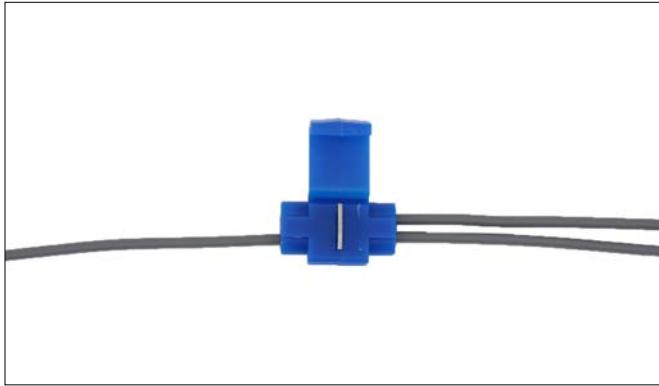
4. Make sure the two wires are centered properly in the connector. Use pliers to push the blade into the connector. This will pierce the insulation of the two wires and electrically connect them. It will also securely hold them together.



2. Insert the boat wire to be tapped into the "front" of the tap connector. The connector opening may need to be pried open slightly for the wire to fit.



5. Fold the cover over and latch into place.



3. Insert the Ridesteady wire fully into the "back" of the tap connector. A stop will prevent the wire from coming out the other side.

Troubleshooting

Issue: Ridesteady won't slow down enough to hit set speed or "fluctuates" / "hunts" excessively.

Fix: Add a throttle return spring [this is common on Mercruiser carbureted 4.3L / 5L engines]. Ridesteady can only pull in the stainless steel cable inside the control cable. It relies on the spring force of the engine's throttle arm to pull back the stainless steel cable when the throttle motor puts slack in the cable. As described in the [Control Cable Install](#) sections, with the driver throttle lever pushed down and Ridesteady OFF, you should be able to manually move the throttle motor spindle back and forth and the engine throttle arm should track these movements. If the throttle arm only pulls in but doesn't retract in the opposite direction, or if slack develops on the throttle motor at all, a "throttle return spring", available at most auto parts stores, may need to be added to the engine throttle arm. See [p.12](#) for throttle return spring installation instructions.

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 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 pixels" appear on the screen or the screen flips vertically -or- other unexplained issues occur.

Fix: "Electromagnetic Interference" may be interfering with the CPU. While many filters are in place to prevent such 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 way as possible. Avoid "bundling" the throttle motor power cable with any other wire other than the power cable.

Issue: LCD slow to respond

Fix: Decrease the contrast in [system settings](#). If the contrast is too high for the given LCD at the given temperature, it may be "overdriving" the LCD which will slow down the effective "refresh rate."

Care & Maintenance**Maintenance**

All fasteners should be checked for retention before each day of boat use.

Storage

The extended-temperature LCD display will freeze at -30°C (-22°F), possibly requiring it to be replaced. It is recommended to remove and store the display in a dry, warm environment if temperatures are expected to reach near or below this temperature.

34 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 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: _____
 1841 S Lakeline Blvd
 Suite 101
 Cedar Park, Texas 78613

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.