

# **WakeboardPro Graphics Display**

## **Mechanical**

**June 2007**

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**Tip:** To adjust contrast on LCD Screen, Press MENU and UP Keys together.  
See Page 6.

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## Section 1 Initial System Start Up

The very first time your PerfectPass is turned on, it may ask you two questions:

1. [ **5.7L ^ = Yes** ] If your boat has a standard 5.7 V8, press the UP key. If you have an optional 6L or 8.1L, press the DOWN key.
2. [ **Read in MPH ^ = Yes** ] If you want your system to display in MPH, press the Up Key. For metric, press the Down Key.

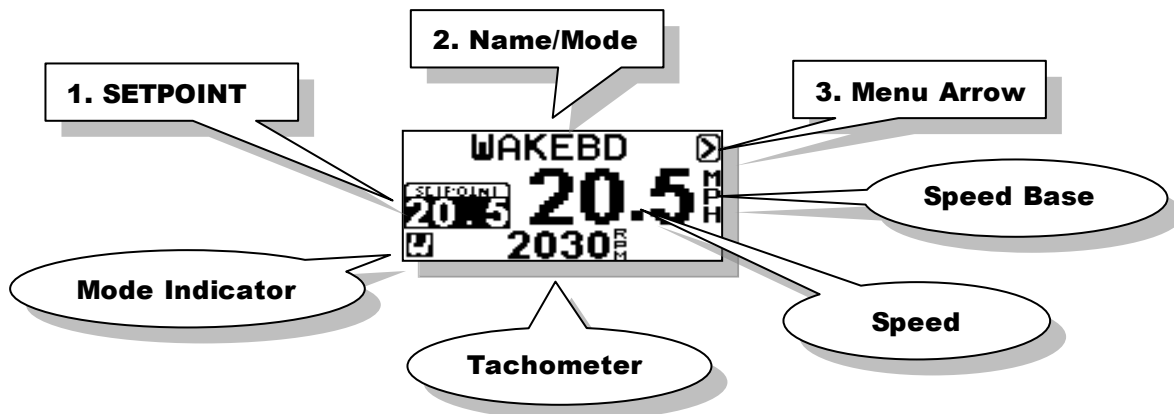
### USING WAKEBOARDPRO

There are three operating modes to choose from: (1) **Wakeboard Mode** is speed based and controls from the paddle wheel; (2) **RPM Mode** allows the user to set an RPM value; and (3) **Slalom Mode** allows recreational slalom skiers to enter a speed for open water skiing. (24 – 36 mph).

The ON/OFF key is pressed to turn control ON or OFF. System should always be in OFF mode when not in use. Turning system ON or OFF is always done at neutral or at idle for safety. You may be asked to confirm you are in neutral as follows [ IN NEUTRAL ^ = Yes ].

Typically, wakeboarders prefer the pull characteristics of the speed based Wakeboard Mode. This mode is designed for 9 – 25 mph. Open water skiers at higher speeds should use the RPM or Slalom Mode.

### Wakeboard Mode (Speed Based)




When system is ON, the screen will appear as above with set point speed at left. By using Menu Key you can move around the screen and highlight set point to make speed changes.

Once desired speed has been set, you can simply drive normally and when set point has been reached or exceeded the system will engage and take over automatically. (You will hear an audible beep and “WAKEBD” heading will become highlighted to confirm engagement.


To disengage system, pull back on the throttle.

The key to good driving is to smoothly drive to engagement speed so PerfectPass can seamlessly take control. If you have a heavily laden boat and need full throttle from start, slowly pull back on handle as speed increases to help PerfectPass engage smoothly.

If the rider falls, pull throttle back and system will disengage. Return slowly to rider and pull them back up. PerfectPass will once again engage when set speed is reached.

**Menu Arrow**  – To move to another mode, use menu key to highlight Menu arrow and press up key to confirm. The following screen will appear with other operating modes you can select.



**Adjustable Parameters KDW, NN** – These background settings allow you to tailor the pull characteristics of WakeboardPro. To access, highlight Menu Key , and press up to highlight Wakeboard mode. When Wakeboard is highlighted, press Down Key and the following screen will appear:



**KDW (Throttle Pull Rate)** – KDW can be changed using up or down keys. The higher the value, the more aggressive the control. Heavy boats may need higher values. Factory setting is about 80. Normal range is 80 – 200.

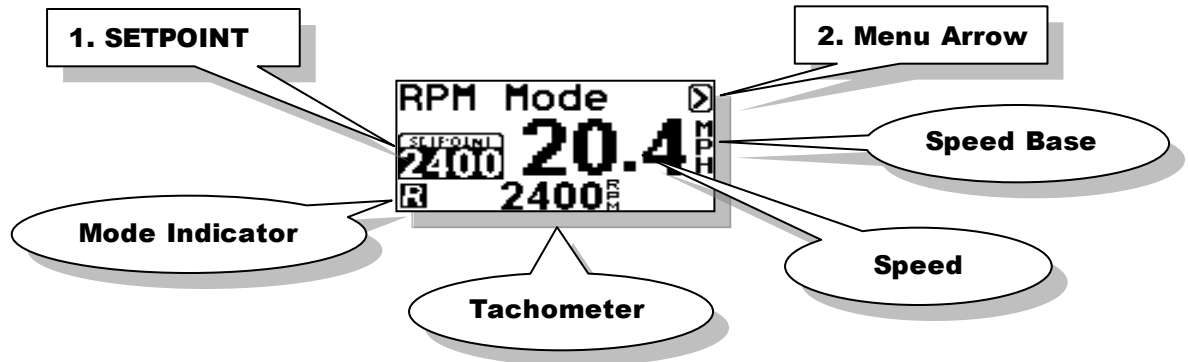
**NN (Paddle wheel Filter Factor)** – NN is set at about 120. The higher the value the more filtering is done. If you feel your boat is surging a little too much, raise value by 20 or 30. If you feel the speed is slowly drifting around too much, try a lower value to tighten control.

**Speedometer Calibration** – If you feel PerfectPass is not showing an accurate speed, see calibration details on Page 7.

## Section 2 RPM Mode

### USING RPM MODE

In this mode, the screen will appear as follows:



Operating in this mode is very similar to using the Wakeboard or Trick modes, except the system is now controlling to an RPM SETPOINT.

### RPM DRIVING

Prior to towing the rider / skier, select the RPM SETPOINT by using the UP or DOWN keys with the SETPOINT highlighted on the screen. Pull the rider up smoothly and continue to accelerate up to or beyond the RPM SETPOINT so the system can engage and take control. The digital tachometer should match the RPM set point.

Changes can be made to the RPM SETPOINT while the system is engaged (“on the fly”) to fine-tune the RPM you desire.

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## Section 3 Slalom Mode (Requires Calibration)



### SIMPLE SLALOM

*This Simple mode is for recreational skiing and will provide an excellent, tournament quality pull, however, it is not designed to be as accurate as the tournament class Slalom modes.*



This mode allows you to set speeds in 2 mph increments ranging from 24 – 36 mph. It is designed for those wishing to use the system for open water skiing.

**(Before calibrating Slalom Mode, you should calibrate at 20 mph in Wakeboard Mode - See Page 7).**

**Step 1 Calibrate RPM Baseline** – Initial calibration of baselines should be done with 2 – 3 people in boat and without a skier. If you set the speed at 34.0 mph, but your digital speed readout shows something different such as 33, simply press the **MENU** key until the  is highlighted then press the **DOWN** key. This can be done on the fly or at the dock. Press the **UP** key several times and the rpm baseline will increase 25 rpm per press. This will increase the rpm on the boat which will increase the actual speed. Adjust the rpm until the actual speed matches the **SETPOINT**. Press the **MENU** key to highlight the  then press the **UP** key to return to the main Simple Slalom screen.



*Baseline Calibration  
Screen*

If you are towing skiers, you can change the **SETPOINT** on the fly (i.e. 30 to 32), or you can raise the rpm baseline setting on the fly by going into the BasCal Screen as described above. For example, you have 32 mph set, but because you have five people in the boat, the speed may be running a little slow due to the extra weight. You can adjust the speed by entering the BseCal Screen and raising the rpm baseline until the digital speedometer matches the desired speed.

## Section 4 Using Name List

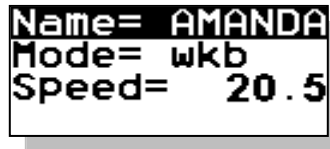
Additional PerfectPass features are accessed by pressing the **MENU & UP** keys together. The features available vary depending on the make and model of your boat. If a feature is not present on your PerfectPass then it is not available on your system. To move to the next feature press the **MENU** key.

### NAME LIST

This version of PerfectPass allows you to store up to eight names and their preferred speed. The Name List can be accessed by pressing the **UP** key when the NAME/MODE section is highlighted or by going into the SUBMENU and selecting the Name List. Once in the Name List press the **MENU** key to move through the list. With the desired name highlighted press the **UP** key to select the name from the list and load their settings or press the **DOWN** key to edit the name.



**Creating Names** – First enter the Quick List. Press the **MENU** key until [NEW ENTRY] is highlighted. Then press the **UP** key to enter a new name. The following screen will then appear:



Scroll through the alphabet using **UP & DOWN** keys, and then press **MENU** to move to next position. Press the **MENU** key to move through the settings. If you are programming a JUMP or SLALOM name there will be another page of settings to enter.

**Editing Names** – As you scroll through list of names, instead of pressing **UP** key to select that name, press the **DOWN** key to edit.

**Note:** Names can be changed by “Editing Names” but can only be deleted by performing “System Reset”.

## Section 5            Other Features

Press **Menu & Up** keys together to access the following:

**Screen Contrast** – By pressing up or down keys you can change the contrast level. Range is 1 – 5. Lower values = better visibility in extreme sun. 3 is normal.

**Name List** – You can get to the name list through this feature, or by highlighting the mode or name on main screen and press up.

**System Info** – This screen will display software version #, battery voltage, engine selection, hour meter and water temperature. (Some information not on all boats)

**Device Test** – Troubleshooting information for servo motor or electronic throttle systems.

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**More Throttle** – If you see the # sign flashing in the upper right part of screen, this means the system is running out of manual throttle. Advance the handle forward a little until the # sign disappears.

### **QUICK REFERENCE GUIDE (Display Operation)**

#### **Change Modes**

Highlight  and press UP Key.

#### **Name List (Short Cut)**

Highlight mode (ie. Wakeboard) or name on screen and press Up Key.

#### **Screen Contrast, Name List, System Info, Water Temp, Device Test**

Press Menu and Up Keys together.


#### **Calibrate Speedo**

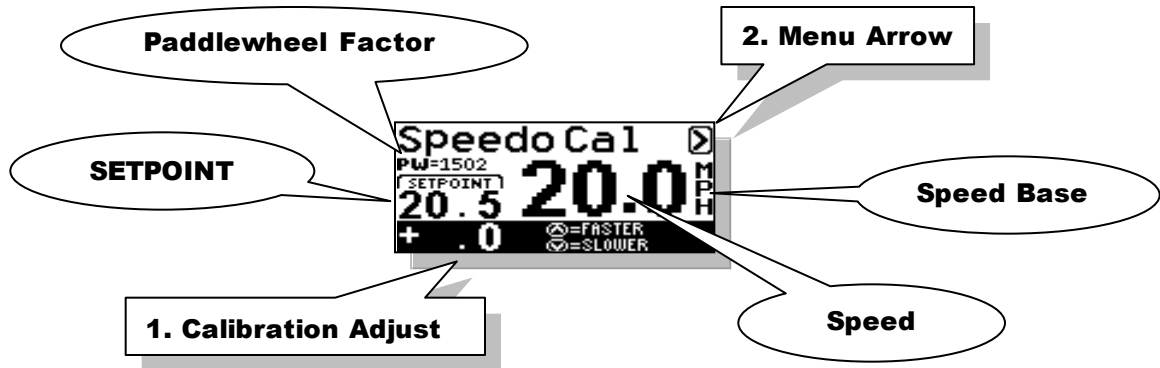
Highlight  in Wakeboard Mode, Press Down Key.



## Section 6

# CALIBRATING PERFECTPASS SPEEDOMETER (Wakeboard Mode)

If your digital speedometer is not accurate, you can go into the **Speedo Cal** screen of the system. This is accessed by pressing the **DOWN** key with the  highlighted on the main Wakeboard screen.




We recommend you check and calibrate if necessary at 20 mph.

With the Calibration Adjust highlighted on the screen press either the **UP** or **DOWN** keys to speed or slow the boat.

**CASE 1.** Boat speedometer reading lower then PerfectPass Speedometer  
Press the **UP** key until the boat speedometer matches the PerfectPass speedometer.

**CASE 2.** Boat speedometer reading higher then PerfectPass Speedometer  
Press the **DOWN** key until the boat speedometer matches the PerfectPass speedometer.

When the speed readout matches the boat or reference speed press **MENU** once to highlight the  then press the **UP** arrow to return to main screen.

**Example:** If you are set and engaged at 17 mph, but the analog speedometer or GPS is reading 18 mph, go into the **Speedo Cal** screen and press the **DOWN** key several times until the boat speed drops to 17 mph so the PerfectPass Digital Speedometer matches the GPS or boat's speedometer.

**Paddlewheel Factor** – This value is the actual calibration value much like an RPM baseline. This number can be used to quickly determine where the calibration is at when troubleshooting the paddlewheel. This number is also very useful when trying to set calibration to match another system or to reset the calibration after a system **RESET** had been performed.

## Section 7            Driving Tips

1. Always pull a rider up smoothly. If you accelerate too far past the target speed, you can gently pull the throttle handle back to assist PerfectPass in taking control. When PerfectPass engages you will hear an audible “beep”. In addition when engaged the Modes (Wakeboard) or Name on Screen will become highlighted.
2. Always leave your hand on the throttle and keep an eye on the lake ahead. Pull back throttle to neutral to stop boat. (The system will immediately disengage and the boat will be under manual control).
3. When returning to a rider in the water, drive very slowly and carefully. Always turn engine off when loading or unloading a rider from platform. Never back a boat up when someone is in water behind.
4. The speed based mode is not designed for skiing & speeds over 25 mph as the control may not be smooth. RPM or Slalom mode is designed for smooth control over 25 mph.
5. “More throttle” If you see the # sign on the screen, this means PerfectPass is running out of control room, press throttle handle slightly ahead until the # disappears.
6. You can temporarily over-ride the system by applying more throttle. The engine speed will increase for about 5 seconds before PerfectPass regains control.
7. In a turn, the engine may accelerate to maintain speed. If you feel it is too aggressive, simply assist the system by pulling back on the throttle to help the rider. As you exit the turn, slowly advance handle so PerfectPass can properly re-engage.



## Section 8 Troubleshooting

### Common Questions & Answers

**1. Condition:**

In both Wakeboard & RPM mode the system beeps to engage, but boat speed never settles in and “hunts” above & below Set Speed.

**Solution:**

*It appears that the PerfectPass throttle cable does not have free movement and is rubbing against engine cover or some other obstacle. A **Linkage Test** should be performed. See Page 11.*

**2. Condition:**

System beeps to confirm engagement, but boat continues past set speed and never locks in.

**Solution:**

*Computer is attempting to control, but servo not responding. A **Servo Motor Test** should be performed. (Servo motor could be seized). See Page 11.*

**3. Condition:**

System “hunting” in Wakeboard mode only. RPM mode working perfectly.


**Solution:**

- 1. Inspect paddlewheel for damage. Does it spin freely?*
- 2. Is paddlewheel fully seated in housing? Is arrow pointing forward?*

**4. Condition:**

PerfectPass digital speed reading shows 22 mph, but GPS indicates boat speed is actually 24 mph.

**Solution:**

*Highlight MENU arrow  and press DOWN Key and [SPEEDOMETER ADJUST] will appear. Quickly press **DOWN** key several times and drop calibration speed by 2 mph. (Can be done in the shop or on the water). Remember, the LCD screen simply shows the data from Master Module so there is no reason to suspect the Display is a problem.*

**5. Condition:**


PerfectPass green light in display is on, but no data on screen.

**Solution:**

*Check to see if servo motor is powered, if not then the system does not have adequate voltage or is poorly grounded and will not start. (Measure voltage on PerfectPass power cable, which should be in excess of 12 V).*

*Note: When ignition is OFF, the black knob on servo motor turns easily. When powered, knob is stiff and is difficult to turn by hand.*

*If servo motor is powered and performs auto tighten rotation but Display has no data, then Display should be changed.*

- 6. Condition:**  
PerfectPass has no digital speed reading.
- Solution:**
1. Check Master Module to ensure paddlewheel cable is properly connected and pins are in proper position and not bent.
  2. Does paddle spin freely?
  3. If all looks well, perform a “System Reset”.
- 7. Condition:**  
UP key on Display does not respond.
- Solution:**  
Make sure all 10 pins on Master Module are in-line where display connects. If connection is OK, keypad switch is faulty, return to PerfectPass for repair.
- 8. Condition:**  
Boat speed drops and throttle handle must be pushed far down to get acceleration.
- Solution:**  
Servo motor is not holding and rotating properly usually due to a bad connection at the servo motor. See Servo Motor Test, Page 11.
- 9. Condition:**  
System is blowing the 5 amp, 1.25” fuse on 12 V power cable.
- Solution:**  
Generally caused by a short or “grounding” problem with the red 12 V power cable on servo motor. Closely inspect wiring particularly around gold resistor. (Remember, resistor & servo motor will run very hot which is normal).
- 10. Condition:**  
Speed in Slalom mode not accurate.
- Solution:**  
Did you go into Calibrate by highlighting MENU arrow , then press DOWN Key. This screen allows you to adjust an RPM baseline up or down so speed is more accurate. If you believe the PerfectPass digital speedometer is not accurate, see “Digital Speedometer Adjust” on Page 7, which is performed in Wakeboard Mode.
- 11. Condition:**  
Speed reading on PerfectPass very low.
- Solution:**
- Inspect paddle, does it spin freely?
  - Is arrow on paddle housing pointing towards bow? Is impellar in correct direction?
  - If paddle looks O.K., perform a “System Reset” to re-establish calibration settings. See Page 11.

## SYSTEM RESET

Turn key ON and quickly press and hold “ON/OFF” and “Menu Keys” together for about 5 seconds until [ SYSTEM RESET ^ = YES ] appears. Answer the questions including YES to [Wakeboard Only ^ = YES].

## LINKAGE TEST

This test should confirm whether the PerfectPass throttle cable & linkage connection is properly working.

With key OFF, turn black knob on servo motor in clockwise direction until snug. (This is the normal start position of the knob). It should always return to this position when returning to neutral. Now push the manual throttle to 1/2 open position. Now take black knob on servo and slowly turn the knob in a counterclockwise direction, and then in a clockwise direction.

As you rotate the knob back & forth, you should see the throttle lever on engine opening & closing very smoothly with each step of the motor. As you turn the knob counterclockwise which lets out cable, the throttle will close back towards neutral. When you rotate it clockwise the throttle will open.

As you rotate the knob back and forth (slowly and quickly), the throttle should open & close very smoothly and the brass L Adapter at linkage should be rotating as well to follow cable. At no point should the throttle cable catch, hook or come into interference with any part that could disrupt the cable movement.

If the cable is rubbing against a decorative engine cover, fuel rail, motor box etc, adjust servomotor and cable to improve alignment. Many plastic decorative engine shrouds can cause this problem. Remove temporarily and run boat if you suspect this could be a problem.

Final Test: With key OFF, push manual throttle to full open position. Watch PerfectPass throttle cable to ensure it can move freely without binding or interference.

**Throttle Return Spring:** PerfectPass can open the throttle (by turning clockwise), but relies on the engine return spring to close the throttle when the servo turns counterclockwise. (The return spring is always applying pressure against the throttle back towards the neutral position). If the servo turns counterclockwise to slow the boat, but the throttle lever on engine does not move or moves very slowly, the return spring could be weak, broken, etc.

If you feel the spring is weak or damaged, an external return spring can be added.

## Servo Motor Test / Auto Tighten Test

Every time you return the boat to neutral when PerfectPass is on, the servo will wind in the cable until snug in a clockwise direct. This is the normal starting point for the servo.

Each time you turn the key on or start the boat, PerfectPass becomes powered and the servo will perform an “auto tighten” function and will attempt to wind in the cable to confirm it is in normal position. (If in proper position, it will appear simply as a “click”, “click”, “click”).

To check servo & servo power wire, with key off turn black knob on servo motor counterclockwise  $\frac{3}{4}$  of a turn. Now turn key on and black knob should turn clockwise about  $\frac{3}{4}$  of a turn as part of auto tighten. If it does, repeat procedure, except this time hold black knob gently to apply some resistance to auto tighten. If it rotates with good strength then it would appear servo & servo power cable are fine.

If it does not rotate or just vibrates, then a wiring phase coming to the servo may be loose or broken. Inspect all wiring around servo. Pull both white plugs apart at servo & inspect pins to ensure they are in place. Gently tug on each wire to ensure they are securely in crimp. Check at MasterModule where cable is connected.

If you cannot locate problem, contact PerfectPass.

### Important Notes:

1. The gold resistor will run extremely hot. This is normal.
2. If system is new, make sure servo power cable is plugged into MasterModule correctly and not upside down. Tips on plug should point up towards label on Module.

## Section 9                      **Installation Instructions** **PerfectPass Wakeboard Pro**

### *Step 1.    Installation of Servo Motor*

Using the two provided hose clamps, loosely mount the servo motor on top of the cooling water hose leading to drivers side exhaust manifold (starboard side on standard inboard engines). See Figure A. Tighten later after final positioning. (See amended installation details “Photo” if inserted for certain engines for servo motor mounting position).

Remove ball joint connector from throttle control lever and remove from the coupling end of Morse control / Teleflex cable. (See Figure B).

Position servo motor throttle cable in line with the throttle control lever. Ensure the locking 10/32 nut is in place on Morse control / Teleflex throttle cable. Screw threaded brass hex connector on the PerfectPass cable onto the end of the Morse control throttle cable. (Do **not** over tighten hex nut). Install L shaped brass throttle adapter to throttle control lever using identical hole as original ball joint. (L adapter must be able to swivel). Using an Allen key, tighten L shaped adapter mounting bolt. (See Figure C). You may find it helps to move the Morse control lever into gear during installation to allow more clearance. (Be sure the washer is against the brass L-Adapter and not under the nut).

Check and adjust position of servo motor ensuring the motor box cover closes properly and servo throttle cable is not in contact with any moving parts. Make sure servo motor cable has 2 or 3 inches of free travel. Securely tighten hose clamps on servo motor. (Do not “tie wrap” cable as it must be able to move freely).

With the throttle in neutral position, adjust brass hex connector if necessary to ensure there is **no gap** between it and the end of the servo motor cable (any gap may cause engine to surge up and down in neutral). Adjust and snugly tighten all parts. (See photo’s, **DO NOT OVER TIGHTEN**).

Turn the black servo motor knob in a clockwise position until **snug**. With throttle in neutral, the linkage should appear as in Figure C.

**Linkage Test** – This is a quick & easy test to check throttle cable & linkage.

With key OFF, push throttle lever to  $\frac{3}{4}$  open position. Now take the black knob on servo motor and wind it counter clockwise a full turn and then clockwise a full turn. Do this slowly in each direction and as you do this the engine throttle arm should be opening and closing very smoothly. If the cable is “rubbing” or “catching” on a fuel rail or decorative engine cover, the servo & cable should be repositioned to eliminate this. The stainless cable inside the black jacket **MUST** be able to seamlessly move for the control to work properly.

With key off, push manual throttle to full open position and back to neutral. PerfectPass cable should move freely in both directions.

**IMPORTANT:**

- Never “tie wrap” PerfectPass throttle cable.
- Make sure all wires are tied away from hot or moving parts and there is adequate clearance.
- The manual throttle on your boat should operate and feel the same as before the PerfectPass was installed, or you may have to adjust the hex nut.

*Step 2. Installation of Master Module*

Mount the Master Module under the dash normally on the bulkhead accessible behind and right of the passenger seat in a dry location. It can also be installed on the left side of driver's bulkhead. The wires from under the dash pod can be easily fed across the bulkhead.

Route servo motor power cable from Master Module to servo motor and connect. (Use tie wraps to keep cable away from moving parts). Make sure the tips **on the plug are facing up** towards the top of the Master Module box. A wire snake will be helpful.

*Step 3. Mount Dash Display*

Remove the right speedometer (if boat has two speedometers) or remove tachometer and install the **In Dash PerfectPass Display** and connect into Master Module. (If there is a speedo tube on back, it should be clamped).

*Step 4. Connect Power Wire*

Depending on the boat and model, there are a number of ways to connect to a switched (12 volt) power source.

1. On boats with traditional analogue gauges and posts on back of tachometer, there is a 12 volt (+) post often marked (IGN) which is an easy connection to the purple wire. The black wire end can attach to the ground (-) post marked (GND).
2. On boats with Borg Warner gauges with no posts, attach the PerfectPass purple power wire to the purple wire leading to the ignition terminal. The black wire can be securely grounded to the grounding bar or other suitable ground location.
3. **2000 - 2005 Nautiques** – There is a main wiring harness and large white plug located behind the dash pod. Connected to this plug is a purple wire carrying the switched 12 volts and a black wire which is a suitable ground connection.
4. **2002 – 2005 MasterCraft** – Power, RPM and Paddle Wheel speed is all located in the special plug and play harness supplied with each system. The MasterCraft supplied white connector is on every boat specifically for PerfectPass. You may have to remove the driver's foot panel to locate this connector in the boat's wiring harness.
5. **2005 Malibu** – There is a plug & play harness for speed, RPM and Power.

*Step 5. RPM Cable Installation*

This connection will depend on the brand and year of boat you own.

- (1) **Standard Installation** (Older boats and boats with traditional Analogue gauges with Posts on back)

The **Gray wire** with ring terminal can be easily attached to the "SEND" post on back of tachometer. This Gray wire picks up the raw engine rpm from this post. The **Black wire** ring terminal can be attached to any suitable ground, including the ground post on the tachometer. (If there is not a post, connect to the solid gray wire coming from the tachometer).

- (2) **2002 - 2005 MasterCraft** – The custom wiring harness supplied by PerfectPass allows for plug & play for RPM, Power & Paddle Wheel.
- (3) **1998-2004 Malibu** (Borg Warner Gauge System)

In behind the dash pod on most models, Malibu has left a Gray (RPM) wire that terminates at a large female spade connector. If you can locate this, you can simply attach the Gray wire on the rpm sensor cable to this connector.

Alternatively, you can locate the solid gray wire in the main wiring harness that leads into the Borg Warner control box under the dash. Use a blue “Tee Tap” connector to connect to this gray wire. You can then attach the gray rpm sensor wire to this using a push on spade connector. The black wire can be securely connected to any suitable ground.

**LS-1** On this engine (pre 2002 only), you only connect the Black wire on the RPM Sensor cable to the Gray wire leading to the Borg Warner control box. (same as LT-R MasterCraft). The gray RPM sensor wire is left un-connected.

**2005 Malibu** – See plug & play harness.

**(4) 1999 – 2001 MasterCraft, 2000 Supra, 2000-2002 Infinity (All Other Brands Using Borg Warner Gauges)**

TBI & Multi Port Engines (except LT-R) – Locate the solid gray wire in the main wiring harness that leads from the engine into the Borg Warner control box under the dash. This solid gray wire carries the raw engine rpm. Use a blue “Tee Tap” connector to connect to this gray wire. You can then attach the gray wire on the rpm sensor to this using a push on spade connector. The black wire can be securely connected to any suitable ground.

**LT-R / LT-1** - On this engine the Gray wire lead on the PerfectPass RPM Sensor cable is not used and can be taped off. The separate **Black wire** end must be connected to the Gray wire located in the main wiring harness leading into the Borg Warner MDC Control box. It is on the engine side of the box that the raw rpm is located. You can attach a blue “Tee Tap” connector to this Gray wire, and attach the RPM sensor cable end to this “Tee Tap” using a supplied spade connector.

**(5) 2000 – 2002 Nautiques**

Same as standard #1 above, except the rpm signal can be picked from the Gray wire coming from the back of the tachometer.

**(6) 2003 - 2005 Nautiques**

Located behind the dash pod is a large wiring harness with a large white plug. The Gray wire in this plug carries the raw rpm of the engine and has been brought to the pod solely for the PerfectPass system. This gray wire is not connected to any gauge. Use a blue “Tee Tap” connector or other splice method to attach the gray wire on the PerfectPass rpm sensor cable to this Gray wire in the harness. The Black wire (ground) on the RPM Sensor cable can be attached to the black wire in this same boat harness.

**Step 6.** Install Paddle Wheel speed sensor and connect to Master Module. (See attached detailed instructions). Note: On most late model boats, a paddlewheel is already standard so PerfectPass did not supply a second paddlewheel.

**Step 7.** Test system power by turning on key. Following a short delay the black servo knob should be difficult to turn indicating system is powered.

A final and easy test to ensure servo motor and cabling is working properly is to turn key OFF, then turn the black knob on servo motor counterclockwise by  $\frac{3}{4}$  of a turn. Now turn key ON and system should perform an “Auto-Tighten” function and wind cable in a clockwise direction until tight.

(If motor does not wind in, but simply vibrates for 5-6 seconds, the servo power cable at Master Module may be plugged in upside down or a connector at servo motor may be damaged. (Pull plugs apart and inspect pins).

For assistance call (902) 468-2150.



## **Installation and Set Up of Stern Drive Paddlewheel (Airmar ST300)**

### **Tools and Material Required**

2 inch hole saw, Sealant eg. GE silicone sealer

### **Installation**

The 2-inch hole is placed approximately 6-7 inches (16 - 18 cm) perpendicular to the centerline of an **inboard ski boat**, beside the drain plug under the engine. (See below for v-Drive location). Never install behind a strake, depth sounder, etc. Normally this is on the passenger side away from the bilge pump and other cables etc. Ensure there is sufficient room to pull the inner paddlewheel assembly from the housing when it is mounted under the engine. In this area of the bottom of the hull there is normally a flat surface away from the turbulence of the tracking fins and lifting strakes. The hole saw is used to cut the hole for the paddlewheel working from the bottom of the boat. (You may wish to drill a pilot hole with a drill bit from the inside to make it easier to locate from underneath)

Before disassembling the paddlewheel unit take note of the arrow on the bottom of the housing and on the top of the inner paddlewheel assembly near the cable exit, these arrows both point forward when the unit is installed. Disassemble the paddlewheel unit by unscrewing the locking cap until it is completely free to turn, then pull complete assembly up and separate from housing. Take care not to lose the paddlewheel itself and its stainless steel shaft, which may be free when the unit is disassembled.

Remove housing nut and rubber ring gasket. (This gasket will be installed later on the inside of boat). The sealant must be placed on the surface of the sealing flange on the housing and also on some of the lower threads of the housing to help lock the sealing nut in place. The bottom of the hull in the area of installation must be clean and dry for the sealant to seal properly; inside the bilge should also be clean to allow the seal nut to be properly tightened. Install housing from below boat with the arrow on the bottom surface of the housing pointed toward the forward direction of travel of the boat, parallel to the keel of the boat. Install gasket and seal nut should be tightened snugly by hand so that the sealant is forced out of the sealing surface and the housing flange is as close as possible to the hull surface. The excess sealant must be wiped away from the housing to give the water flow a clear path. A final check of the location of this directional arrow and inside notch in housing should be made before the sealant is allowed to setup.

Reassemble the paddlewheel unit by sliding the inner unit into the housing with the arrow on the inner housing pointing toward the front. (Ensure paddlewheel assembly is properly centered in “notch” of housing, with arrow pointing toward bow). Hand tighten the locking cap.

The output cable should be run under the floor with the servo power cable so that it can be plugged into the master module.

*(Included with this unit is a “Plug” and extra paddle and axle kit.)*

**V-DRIVE / WAKEBOARD BOATS / STERN DRIVES** – The paddle is typically installed in front of the engine, just behind the gas tank. *(This area is generally accessible from the engine compartment or under rear seat.)* It is installed typically 7 – 8 inches off center, clear of any strakes in the hull, depth sounders, etc. Refer to any addendums that may be included. Never install behind a water intake or any other item that could cause turbulence.

**The key to a good installation is to place the paddle in a location where there is nothing to disturb the flow of water in front of the paddle for 5-6 feet.**

**WARNING**  
**RELEASE OF LIABILITY – ASSUMPTION OF RISK**

**IMPORTANT**

*(Detach, sign and mail immediately)*

**YOU MUST READ THIS!**

The PerfectPass Speed Control device is a high performance mechanism designed solely for use with water ski and wakeboard boats operating under ideal, calm conditions utilizing a spotter and all other safety crew and requirements of tournament water skiing. The PerfectPass Speed Control device should not be used for any other purpose or under any other conditions.

**YOUR USE OF YOUR PERFECTPASS SPEED CONTROL DEVICE IS CONDITIONAL UPON YOU ASSUMING ALL RISKS, LOSSES AND DANGERS RELATING TO USE OF THIS DEVICE.**

Both purchaser and/or anyone utilizing the PerfectPass Speed Control device acknowledges that their purchase and or use of this device is conditional upon them releasing and forever discharging PerfectPass Speed Control Systems Inc., its directors, officers, employees, agents and/or dealers, their heirs, and assigns **from any and all liability for personal injury or property loss** and from any other claims, demands, losses or causes of action, whether occurring prior to, during, or subsequent to or directly or indirectly connected with the use of the PerfectPass Speed Control device, **and whether caused by any persons negligence or otherwise.**

The PerfectPass release of liability, and warranty agreement shall be interpreted in accordance with the laws of the Province of Nova Scotia, Canada, and **IT IS FURTHER AGREED** that any legal proceedings that either directly or indirectly relate to the PerfectPass Speed Control device shall be conducted within the Province of Nova Scotia, Canada, regardless of where arising.

The purchaser hereby agrees to inform any subsequent purchasers or anyone using the PerfectPass Speed Control device, of the conditions of this Release of Liability, Assumption of Risk Agreement. It is agreed that there shall be absolutely no alterations to this agreement whether by implication or otherwise.

\_\_\_\_\_  
Purchaser Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Address

\_\_\_\_\_  
Serial Number  
(found on Master Control Module)

\_\_\_\_\_  
Name (Please Print)

(Must be signed to affect valid purchase and activate warranty agreement, detach and mail immediately to PerfectPass Control Systems Inc., 14 Trider Crescent, Dartmouth, Nova Scotia, B3B 1R6, Canada).

## **LIMITED WARRANTY**

During the first 12 months from date of original retail purchase, any PerfectPass component that fails due to defects in materials or workmanship will be repaired or replaced at the option of PerfectPass at no charge.

All warranty claims must be authorized in advance and a Return Authorization (R/A #) issued. All packages, correspondence, documents and packing slips must reference this R/A #.

Warranty excludes components damaged by improper installation or improper use of boat. Servo Motors are water resistant, but not water proof. Servo motors may become damaged if excess water is run in a boats bilge and this may void warranty. Ensure your boat is properly "bilged" prior to operating.

### **Warranty Service:**

1. If your PerfectPass was factory installed, any warranty issues should be directed to your authorized dealer. PerfectPass encourages all customers to contact us prior to visiting your dealer for "technical support" as many issues may be easily handled direct with customer.
2. If your PerfectPass was purchased and installed by a dealer you may contact your dealer direct or initiate a warranty claim with PerfectPass.
3. If your PerfectPass was purchased directly from the Company, contact us at the number below.

### **Warranty Service / Technical Support**

PerfectPass Control Systems Inc.  
14 Trider Crescent  
Dartmouth, Nova Scotia  
CANADA B3B 1R6  
(902) 468-2150

(Hours: Monday to Friday, 8:00 am – 4:00 pm EST)

***PERFECTPASS***<sup>®</sup>  
*THE WORLD LEADER IN SPEED CONTROL*