

PerfectPass Wakeboard Pro Installation Instructions

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).

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 _ 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 can be plugged using a golf tee or clamp).

If you have the standard **External Display**, install using supplied mounting post to the right of dash next to wind screen. In the event you have 5" gauges, generally the PerfectPass 5" display replaces the tachometer. (See specific details included with 5" gauges).

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. **2003 - 2004 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 – 2004 MasterCraft** – Power, RPM and Paddle Wheel speed is all located in the special plug and play harness supplied with each system.

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.

- (2) **2002 - 2004 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.

(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 - 2004 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 counter clockwise by 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 Setup Instructions for PerfectPass Paddlewheel System – ST300 Paddlewheel

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. 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.