

Official Speed Control of USA WaterSki & U.S. National's

Official Speed Control of the Pro Tour, Masters, U.S. Open, Malibu Open

DigitalPro

By PerfectPass

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MasterCraft DBW

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APPENDIX

All Ball Timing Information

Warning: PerfectPass highly recommends you become familiar with the operation of your new boat prior to using the speed control. (Leave in OFF position). Once you are familiar and comfortable with the operation and handling of your boat, try the speed control in the different modes without a skier to familiarize yourself with its operation. If you feel it is not working properly or have questions, leave in the OFF position and contact PerfectPass or your dealer immediately.

USER'S GUIDE

Section 1. GETTING STARTED

INITIAL SETUP - The display will guide you through this set up. Read slowly and carefully.

Your new PerfectPass system must now complete a short set up procedure to familiarize itself with your particular boat and engine. *(This may have been performed by your dealer if factory installed)*

- Step (1)** Engine Selection. On some systems you will be asked to select the engine in your boat. It will appear as [5.7L ^ = Yes]. This means if you have standard engine, press **UP**. For optional big block 6L or 8.1L, press **DOWN**.
- Step (2)** The display will now show [read in MPH ^ = Yes]. It is asking you if you would like the display to operate in mph. If you do, confirm by pressing the **UP** key. If you want kph press the **DOWN** key. (We have selected mph for illustration purposes)
- Step (3)** [WAKEBOARDPRO ^=Y] The display will now ask if want the system to be a WakeboardPro or a 3-event DigitalPro: For WakeboardPro Press **UP**, for **DigitalPro** press **DOWN**.
- Step (4)** The display will now move into the Slalom mode, described in the next section.

GETTING FAMILIAR WITH PERFECTPASS

Turning System ON and OFF – All system functions require the PerfectPass control system to be powered up (ignition in ON or Accessory position). The **ON/OFF** key turns the PerfectPass control ON or OFF. The system requires the boat to be in neutral before turning the system ON or OFF. After pressing the **ON/OFF** key [IN NEUTRAL ^ =Yes] may appear to remind the driver, and confirm the boat has been returned to neutral. When PerfectPass is OFF it will not engage. Any time you operate your boat the system will be powered up, although it can be in the OFF mode. Every time you power up PerfectPass it will return to the last event and speed that was used.

System ON




System OFF





Engaging System – With PerfectPass ON, the system will automatically engage once the **SETPOINT** is reached. PerfectPass requires the driver to bring the boat up to and slightly past the **SETPOINT** before it will engage. When the system engages it will sound an audible beep and the top line will become highlighted. In Slalom mode the screen appears as follows:



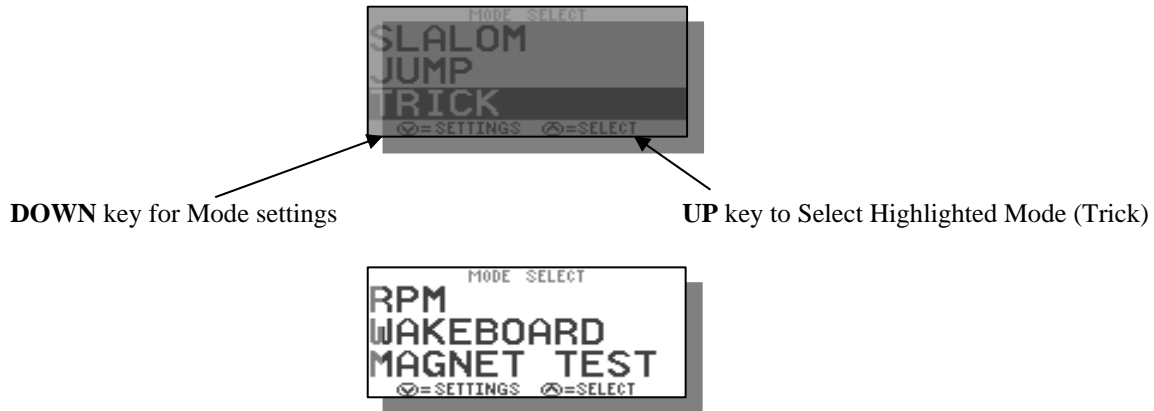
Disengaging System – The PerfectPass system is unable to increase throttle position past the physical position of the throttle handle. This important feature gives the driver the power to over ride the system at any point by simply pulling back on the throttle. If the throttle handle is moved back past a point slower then where the system needs to be to control it will disengage and boat will be under manual control.

Moving Around The Screen– The **MENU** key allows you to move around the screen to the various features. Any time you scroll to the Menu Arrow Icon  the system is prompting you to press either the **UP** or **DOWN** keys to select or

confirm an option. Pressing the **DOWN** key on the  brings you into a calibration screen. The calibration screen varies depending on the mode; the specifics of these screens will be covered within each mode description. Pressing the **UP** key on the  brings you into the Mode Select Screen.

MODE SELECT SCREEN

To change modes press the **MENU** key until the desired mode is highlighted. Press the **UP** key to go into the highlighted mode. Press **DOWN** to go into the Mode's background Setting Screens.



SUBMENU SCREEN

To enter the SUBMENU press the **MENU** and **UP** keys together, on any of the main mode screens.



Contrast – To adjust the darkness of the lettering on the screen you can change the contrast. This value can be adjusted from 0-10 and is saved in the memory. The smaller the number, the brighter the screen will be in bright sun - 4 is normal.

If you turn your boat on but cannot see the screen, press **MENU & UP** Keys together and adjust contrast Up or Down.

Name List – You can pull or enter a name from the name list here. The full description of the Name List is in Section 10 of the manual

System Info – General system information can be found here. The software version, engine selection, system voltage and water temperature (not equipped on all boats) can be found here. *See Section 10. ADDITIONAL FEATURES* for more information on this feature.

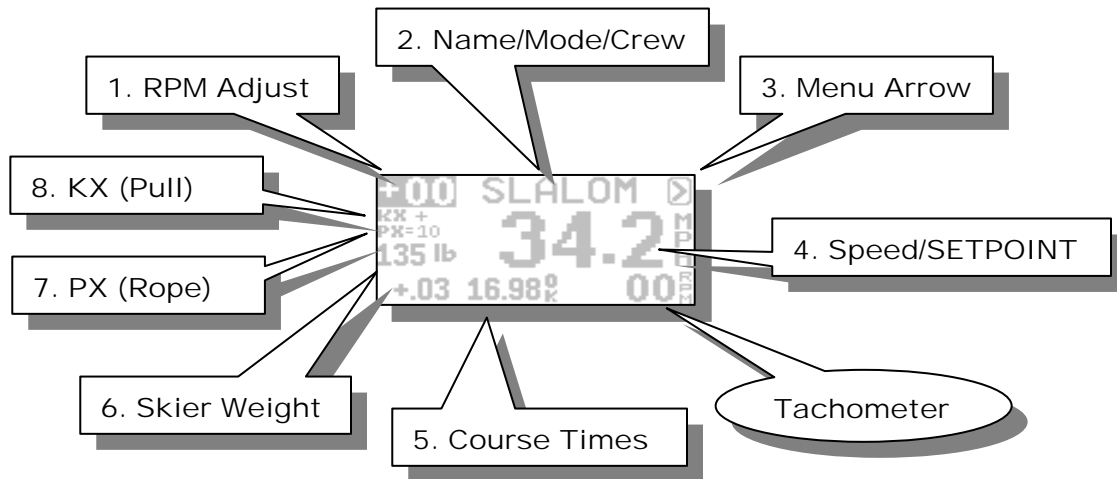
Device Test – This test allow you to test for proper control of the rope switches and for system troubleshooting. *See Section 10.*

Section 2. SLALOM MODE

USING SLALOM MODE

The Slalom mode is designed to give a skier an optimum and consistent pull through a Slalom course while producing perfect timing passes. This section covers the various Slalom Modes within the PerfectPass system.

The main RPM based Slalom (36 mph – 24.9 mph) screen appears as follows:



As you press the **MENU** key you will move around the circle following the numbers above.

1. RPM Adjust

This value directly adjusts the RPM/Speed value the system is trying to hold. If a time is fast or slow, you can enter an RPM value for the next pass. Example: A time was a little fast and PerfectPass suggested “-20 RPM”. Enter -20 on RPM Adjust. You may also use this in a headwind/tailwind situation.

2. Name/Mode/Crew Weight

This section of the screen displays either the Mode, Slalom or a Skier’s Name pulled from the Name List. Press **UP** key to access the Name List:



Name List is discussed in Section 10.

Press **DOWN** key to access the Crew Weight



Enter the Crew Weight in pounds using the UP and DOWN keys. Press the MENU key to confirm and continue.

3. Menu Arrow

Press **UP** key to change modes or mode settings:



Change between modes using Menu Key.

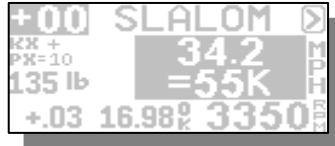
Press **DOWN** key to Calibrate system:



The calibration screen is described below in this section on Page 6.

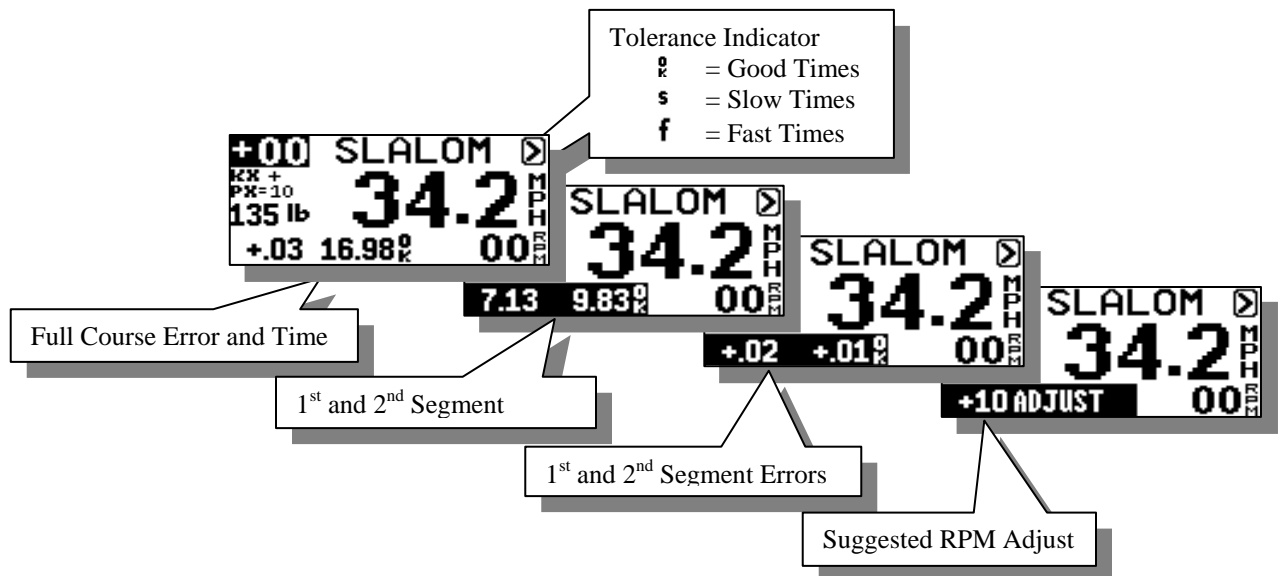
4. Speed/SETPOINT

The speed readout will turn into the SETPOINT when the engine is below 1500 RPM or the Speed/SETPOINT is highlighted. When this is highlighted the metric conversion will appear in this area of the screen. Press **UP** or **DOWN** keys to select desired **SETPOINT**:



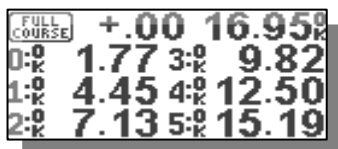
5. Course Times

This section of the screen displays the timing information from the last pass. As well as the suggested RPM adjustment based on the times. These screens will scroll automatically at the end of each pass. The result of this check is shown to the right of the times as shown below.



With the times highlighted on the screen you can press the **DOWN** key to view the All Buoy Timing information.

ABT



All buoy times are displayed on one screen with full course error and full course time at the top. Press any key to return to main screen.

6. **Skier Wight**

To enter or adjust skier weight simply highlight this section of the screen and press the UP or DOWN keys to make adjustments. The skier weight is entered in pounds, i.e. the above example shows a skier with a weight of 135 pounds. The skier weight is required so the PerfectPass system can apply the correct amount of RPM to compensate for their pull. (1 pound = 1 RPM).

7. **PX (Rope Switch Setting)**

Factory setting is 0, which is the off position (typical values range from 5 – 10). If the optional Slalom Switch is used, this is the percentage of skier weight which is applied during each pull (i.e. A value of 10 would apply 20 rpm to a 200 pound skier). A value of 0 means no pull from the switch.

8. **KX (Throttle Response)**

The KX value represents the throttle control response of the system. Under the current rules, a skier is encouraged to use the factory settings or normal (represented by an “n” on the screen), but has the option for a higher more immediate throttle response setting (+ or ++). As well they have the option for a lower KX (-).

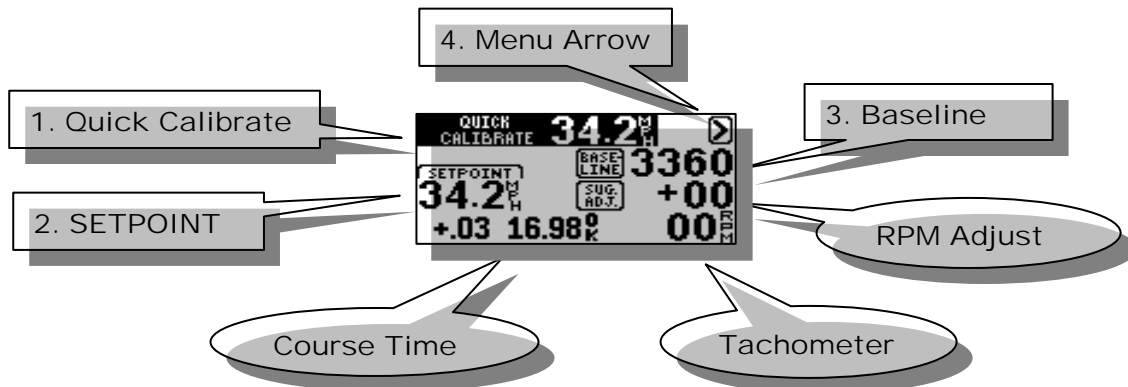
Tips:

- (1) A shortcut to skier weight in Slalom Mode ... press and hold MENU Key.
- (2) Crew Weight Calculator – When crew weight is on screen, press UP and DOWN Keys together.



SLALOM CALIBRATION / SETTING BASELINES

(Your new system must be calibrated for accuracy)




Your system must be calibrated for accuracy in a course. This is often called setting **Baseline RPM Values**. In slalom mode (without a skier) you must complete a timed slalom pass at each official speed you intend to use. This must be done in a course using magnets and Mag Sensor or a PerfectPass Hand Timer. Once calibrated, these new settings will be maintained in the system memory.

Step 1. In Slalom Mode, enter accurate Crew Weight, set **Skier Weight to 0 and RPM Adjust to 0.**

Step 2. Set speed (ex: 34.2) and engage system prior to course.

Step 3. Mag Sensor will trigger at entrance gate, ball 3 gate and exit gate. (Alternatively, if using Hand Timer push button at same gate locations).

Step 4. Stop boat, highlight  Key and press Down to access **“Quick Calibrate”**. Press Up Key to confirm Quick Calibration request. System will confirm **“Baseline and Speedometer Calibrated”**.

Step 5. After system confirms calibration at 34.2, change speed and repeat procedure.

23 MPH AND LOWER

As you calibrate the various slalom speeds, you will note that 23 mph and lower are speed based. After you do a Quick Calibrate at 23 mph, you will be asked to perform a **“Master Recal”**. A yes to **“Master Recalibrate”** will automatically calibrate all other **“under 23 mph”** slalom speeds.

(These under 23 mph speeds can be timed and calibrated independently for greater accuracy if desired).


TOWING A SKIER (The Basics)

Step 1. Enter Crew Weight, Enter Speed and Skier Weight.

Step 2. Pull skier up and engage system prior to course. (You will hear an audible beep).

Step 3. As you exit course review times on screen. If time was not perfect, the system will show an rpm suggested change. I.e. **“+20 ADJUST”**. You should enter an RPM Adjust value or 20 on main screen for next pass. This will speed up boat by 20 RPM. You may also use this feature in a headwind / tailwind situation.


ADDITIONAL SLALOM SETTINGS

Additional Slalom Settings are accessed by pressing the **UP** key on the Main Slalom Screen with the  highlighted. Then press the **DOWN** key when SLALOM is highlighted on the Mode Select Screen. The first two options can be accessed from the Main Slalom Screen as described above as well as here in the Slalom Settings Screen.



Crew Weight – This setting can also be accessed on the main Slalom Screen as mentioned above on Page 3 or through the Slalom Settings screen. This value should be set to represent the total Crew Weight in pounds in the boat. It is essential this value be properly setup to ensure you get good times.

Crew Weight Calculator - The system will add the weight of up to 3 individual crewmembers. Simply go to “Crew Adj” on the list, then press the **DOWN** and **UP** keys together, enter the weight of crew member #1, press **MENU** and do the same for crew member #2. The system will total the weight automatically.

Calibrate – Press the **UP** key to enter the Baseline Calibration screen. This can also be accessed by pressing the **DOWN** key with the  highlighted on the Main Slalom Screen. To check baselines, complete a timing pass and then go to this calibrate option. Press Up to enter Calibration Screen and then Up on Quick Calibrate to confirm calibration.

SSB (Second Segment Balance) - The percentage of skier value driven RPM that is removed during the second segment to maintain an ideal time in slalom.

Example: If your 2nd segment is running a little on the fast side relative to the first segment time, you would raise the SSB. The higher the value, the more RPM removed from the boat speed in the 2nd. Typical value is about 10.

RPM OFFSET – Press the **UP** key on this feature to view and edit the 3 Offset values, 36, 34.2 and LWR. The lower (LWR) is used for all slower speeds. If you are finding that you are continually running less (or more) than a skier's weight to achieve a good time, you can enter an rpm offset value. The OFFSET value is only applied when a skier weight is entered. With a zero skier weight the OFFSET value has no effect.

Example: On a typical boat with a skier's actual weight entered, you have to run 25 less rpm to achieve an accurate time. If you are consistently seeing this, you can enter an offset rpm value (i.e.: -25) and the system will allow you to run all other values as you normally would.

The offset value is independently set for 36.0, 34.2 and speeds 32.3-24.9 (LWR).



RPM Offsets

WT (Wait Time) - For tournament use to provide each skier the same wait time between passes. The number of seconds between passes (i.e. 40 seconds). Starts timing as boat exits the course. Two short beeps are indicated with 10 seconds left, followed by three long beeps when time is up.



Previous Times – To reload the previous times simply highlight this item and press the **UP** key. The full course and segment times can be viewed from the Main Slalom Screen. The ABT's can be viewed by pressing the **DOWN** key with the Timing Information highlighted on the Main Slalom Screen.

ADDITIONAL SLALOM INFORMATION

Digital Speed Readout – The digital speedometer on the screen is for information only in RPM based Slalom. If you feel it is not reading accurately, go into Quick Calibrate feature after running any timed pass and press the **UP** key to recalibrate the speedometer.


Setting Baselines / Calibrating Speedometer without a Course – If you do not have the benefit of a course, you can manually set baselines and calibrate the speedometer. This must be done at each slalom speed and you will require an accurate boat speedometer or GPS.

Example: Starting at 36 mph, you engage system and note actual speed on the GPS is 35. Go into the Baseline Calibration screen and raise the RPM Baseline about 100 rpm. This will speed up the boat to about 36 (100 rpm = 1 MPH). If speed is now accurate, the final step is to calibrate digital speedometer. Note the digital speed readout and if it is reading 37, go into Speedometer Calibration Screen. Now press the **DOWN** key and lower speedometer calibration by one mph. Run boat again to confirm accuracy. Once the baseline and calibration is set, it will be saved within the system memory. Now change speed to 34.2 and repeat. All speeds you plan to use must be done.

More Throttle – If you see the  replace the  on the Main Slalom Screen, the system is indicating it needs more manual CCthrottle in order to maintain the speed. In this case just move the manual throttle forward a little.

Smart Timer False Triggered - The Smart Timer is sensitive and will false trigger outside the course on waves, etc. To avoid false triggering, always slow the boat slightly to disengage the system after exiting the course between passes. The system will not false trigger if it is not engaged. (In the event the Timer does trigger before the course, press the **UP** key to reset Timer).

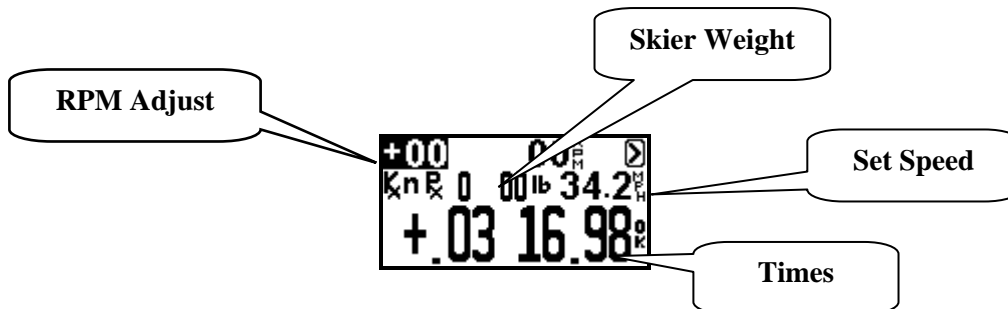
CR – Control Setting - The “CR” value can be adjusted to improve engagement, lock in and control. (See page 23 for details). Recommended values: 2005 MasterCraft 1600
2006 MasterCraft 1950

Option  Slalom Switch - If you have a Slalom Switch, refer to detailed instructions sent with switch. The switch is beneficial to “short line skiers”. For full details, please contact PerfectPass, or log on to www.perfectpass.com.

Tournament Mode – Slalom

If you press the Up & Down Keys together while in slalom mode, the new Tournament Mode will appear. The only difference in this mode is the screen layout, particularly the size of the timing data.

Baselines should be set and established in standard slalom mode.



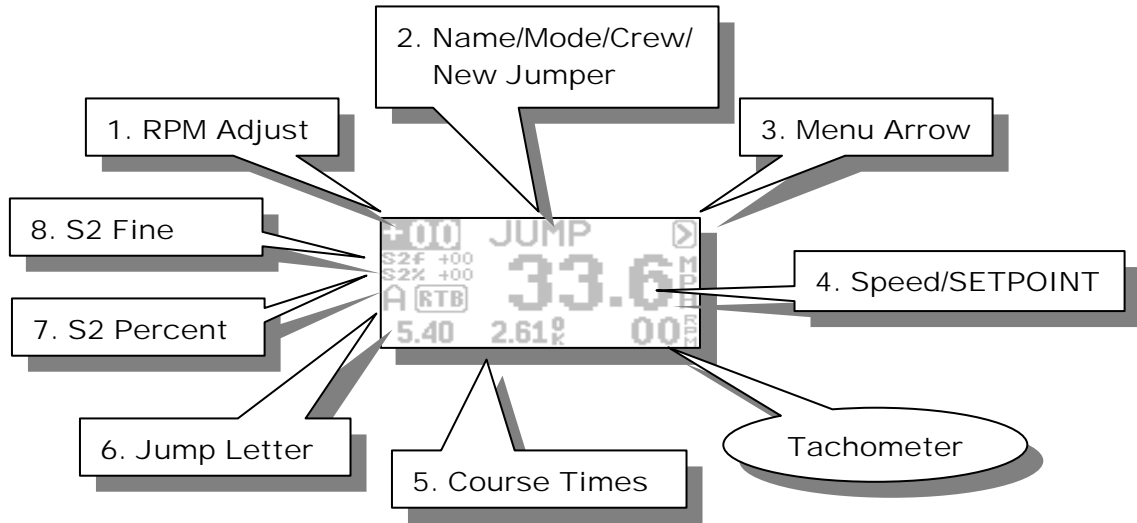
Section 3. JUMP MODE

USING JUMP MODE

WARNING: (Timing must be used in Jump mode and a proper two segment jump course is required for system to work properly. Do not use PerfectPass in Jump mode without a proper course, integrated timing and experienced operator. Because the counter cut pull and cut to the ramp are different, you must have timing activated and running as the boat heads towards the ramp.

The Jump mode is RPM based and therefore baseline values must be established just as in Slalom mode. Setting the jump baseline values must be done in a proper two segment jump course. Jump Letter must be set at A for this process.

The Jump mode main screen will appear as follows:



1. RPM Adjust

RPM adjust allows the driver to increase or decrease the overall times (1st & 2nd segment) by putting in a positive or negative RPM adjustment.

Example: If the times are running consistently slow on both segments, you could add a value such as +20 rpm and the speed will be increased. You may wish to do this for a particular jumper (a heavy puller) or for a number of jumpers if the times are drifting in a certain direction

2. Name/Mode/Crew/New Jumper

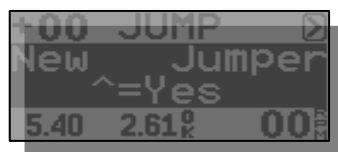
This section of the screen displays either the Mode Name or a Skier's Name pulled from the Name List.

Press **UP** key to access the Name List:



Name List is discussed in Section 10.

Press **DOWN** key to access the New Jumper and Crew Weight



Press the **UP** key to enter a new jumper or **DOWN** key to enter or edit the crew weight. New Jumper is covered below.



Enter the Crew Weight in pounds using the **UP** and **DOWN** keys. Press the **MENU** key to confirm and continue.

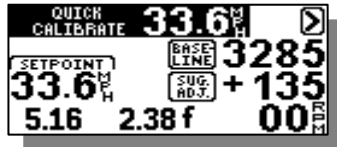
3. Menu Arrow

Press **UP** key to change modes or mode settings:



This allows you to change modes and mode settings. The Additional Jump Settings will be discussed below.

Press **DOWN** key to Calibrate system:

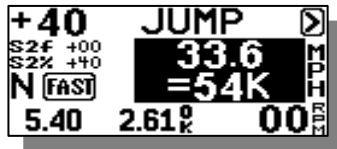


The calibration screen is described below in this section.

4. Speed/SETPOINT

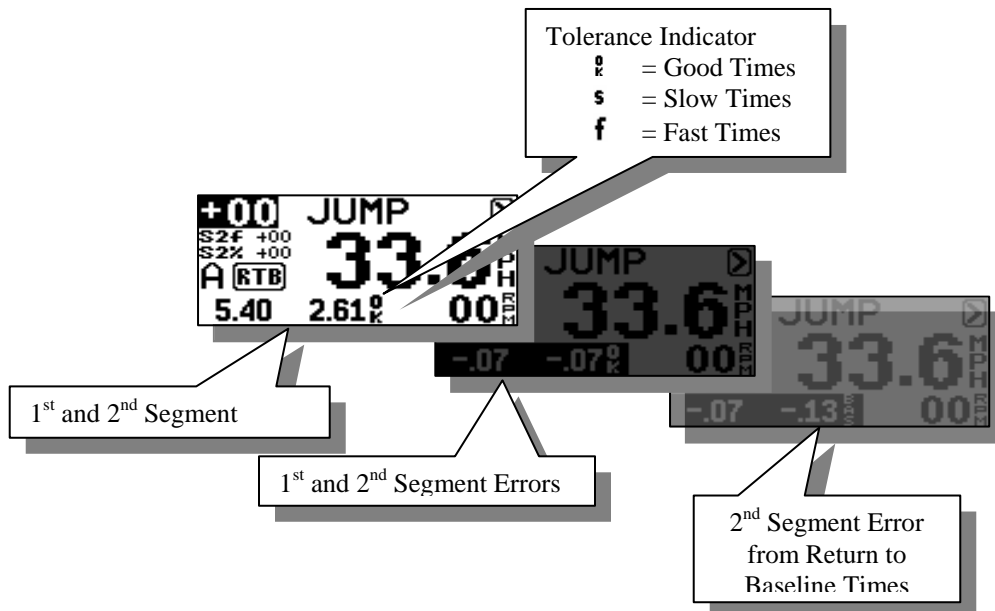
The speed readout will turn into the SETPOINT when the engine is below 1500 RPM or the Speed/SETPOINT is highlighted. When this is highlighted the metric conversion will appear in this area of the screen.

Press **UP** or **DOWN** keys to select desired SETPOINT.



5. Course Times

This section of the screen displays the timing information from the last pass. If Jump Letter is set to A and RTB, the second segment error from Return to Baseline will be displayed after segment errors as seen below:



6. Jump Letter

The Jump Letter is a combination of Jumper Weight, Jumper Distance and ability. This Jump Letter represents how much throttle will be applied once the Rope Switch is closed as the skier pulls. The higher the Jump Letter selected the more aggressive the pull will be. If you are unsure what Jump Letter you should use then start by using the 'New Jumper' feature as described below. This will automatically generate a Jump Letter based on your weight and distance.

7. Second Segment Percent (S2%)

This is a percent of the Jump Letter RPM that is applied once the boat enters the 2nd segment. Under IWSF and AWSA rules, the boat is permitted to speed up in the 2nd segment. The higher the number, the more the boat will accelerate. A typically value for S2% is +60, the higher the value, the faster the 2nd segment.

Example: If the 1st segment times are good, but the 2nd is a little slow, you would raise the number.

S2 RTB – Works similar to S2%. Used when “Return to Baseline” is selected. Only applicable if skiers are activating switch and use a Jump Letter of J or higher.

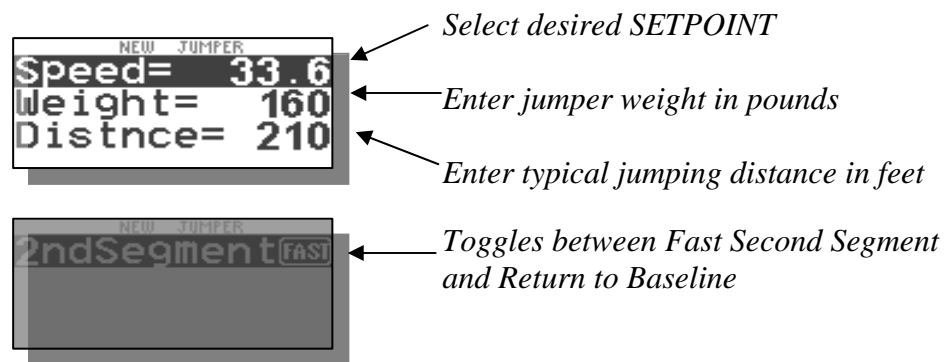
8. Second Segment Fine Adjust (S2 Fine)

This adjustment allows the driver to effectively fine adjust the 2nd segment only. It comes set at 0, which means a neutral effect. A number such as 30 would increase the 2nd segment by 30 rpm. Higher number speeds up the second segment. If skier does not trigger switch or has a letter less than J, S2 fine should be used to speed up second segment.

Example: A jumper that does not cut and does not fully activate the switch may require extra rpm in the 2nd segment to keep the 2nd segment in tolerance. (In this case, S2 Fine is more effective than S2%).

Entering a New Jumper – To enter a new jumper highlight the NAME/MODE/CREW/NEW JUMPER section of the screen and press the **DOWN** key. Then press the **UP** key to confirm you would like to enter a New Jumper.

You will be asked to enter and answer the following information after which a Jump Letter will be calculated for you and displayed on the main screen. Move to the next selection by pressing **MENU**.




Return to Baseline (RTB) – If you selected Return to Baseline the screen will show **RTB** to the right of the Jump Letter. When RTB is selected the boat speed will immediately go to the baseline value as boat enters the second segment. If you have a skier using the switch with a value of J or higher, you can enter an S2 value which is a % of switch driven RPM. A setting above 0 will speed up boat in second segment if required to balance times. (This is similar to S2% used when Faster 2nd Segment is selected).

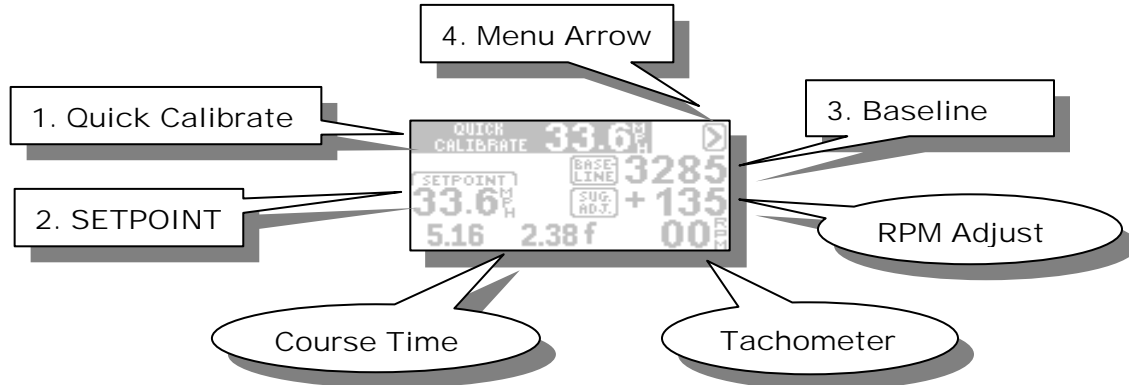
Fast 2nd Segment – If you selected to run the fast 2nd segment, the screen will show **FAST** to the right of the Jump Letter.

Calibrating RPM Baselines - You can set RPM Baseline values for all of the official jump speeds (28, 29.8, 31.7, 33.6, and 35.4) or just the ones you use regularly. Let us assume you wish to set up 33.6 mph (54 kph). Enter the **SETPOINT** of 33.6 mph by pressing the **MENU** key until the 'Speed/SETPOINT' section of the screen is highlighted, then adjust the **SETPOINT** to 33.6 = 54K. Set the Jump Letter to A. Now bring the boat smoothly up to the **SETPOINT** to engage the system. (The system engages as soon as the default RPM Baseline value is reached, the NAME/MODE section will become highlighted, and an audible beep will sound). Enter the jump course and time both segments. As you exit the course the



times will be displayed and then the difference from actuals. The display screen will show the 33.6 mph times. The jump letter is set at A, RTB (return to baseline times are used). An example of this is shown in JUMP TIMING screens shown earlier in this section.

If the times are not in tolerance or close to actuals then the RPM Baseline values will require adjustment. The easiest way to do this in Jump mode is to go to Quick Recalibrate by pressing the **DOWN** key with the  highlighted. This will bring you to the Calibration screen as seen below.



Press the **UP** key on the Quick Calibrate message to recalibrate the baseline based on the times recorded from the last pass. In this example it is suggesting your RPM Baseline should be increased by 135 rpm. When you perform a Quick Calibrate the suggested adjust of 135 will be added to the baseline and saved in memory. The system will also calibrate the digital speedometer if the times are within the "OK" tolerance.

Now engage system and time boat again. If the times are still not close enough, repeat above steps until accurate. If you wish to set up RPM Baseline values for other speeds (i.e. 31.7 mph), change the SETPOINT and repeat the above steps.

JUMP DRIVING

WARNING – Using the Jump mode with Jump Switch is for experienced drivers and skiers only. Please read carefully prior to operating. The pull is very aggressive and designed for tournament water skiers only. You **MUST** have integrated timing and a proper jump course for system to operate properly.

Assuming the RPM Baseline values have been accurately set, you are now ready to tow skiers.


First enter your Jump Letter or enter a "New Jumper" as explained above. The Jump Letter can be changed by pressing the **UP** or **DOWN** keys with the Jump Letter highlighted on the screen.

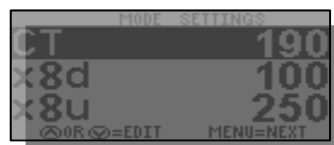
The key to a good pull and good times is to get the correct Jump Letter. If the pull to the ramp is solid and the first segment time is good, you know the Jump Letter is OK. If the time on the 1st segment was slow, you will require a higher letter on the next pass and vice versa. (Once engaged, push handle to full open position to allow PerfectPass room to throttle up when pulling long distance jumpers).

If the first segment time was good, but the 2nd was slow, raise the S2%.

Important Note: If the timer is triggered prior to entering the course, it must be reset by pressing the **UP** key. Failure to reset will result in an improper pull to the ramp.


ADDITIONAL SETTINGS

Additional Jump Settings are accessed by pressing the **UP** key on the Main Slalom Screen with the  highlighted. Then press the **DOWN** key when JUMP is highlighted on the Mode Select Screen. The first three options can be accessed from the Main Slalom Screen as described above as well as in the Jump Settings Screen.



Crew Weight – This setting can also be accessed on the main Slalom Screen as mentioned above or through the Jump Settings screen. This value should be set to represent the total Crew Weight in pounds in the boat. It is essential this value be properly setup to ensure you get good times.

Crew Weight Calculator - The system will add the weight of up to 3 individual crewmembers. Simply go to “Crew Adj” on the list, then press the **DOWN** and **UP** keys together, enter the weight of crew member #1, press **MENU** and do the same for crew member #2. The system will total the weight automatically.

Calibrate – Press the **UP** key to enter the Baseline Calibration screen. This can also be accessed by pressing the **DOWN** key with the  highlighted on the Main Jump Screen.

New Jumper – Details for entering a new jumper are outlined above. This should be used when unsure what Jump Letter to select.

CT (Counter Cut Time) - The maximum length of time the system will throttle once the skier pulls and closes the switch on the counter cut. Example: a value of 175 is 1.75 seconds and may be used in a tail wind. In a head wind you may want a longer pull so you could move it to 200 – 220 (2.0 – 2.2 seconds). The factory default is 190, or 1.9 seconds.

x8u and x8d - These settings were always riding in the software, but were not adjustable values. With the higher horsepower engines and strong props being produced, these values are available for adjustment if needed for high-end jumpers.

x8u – Represents the rate of throttle up on counter cut and cut for ramp once switch is activated. The larger the value, the softer the start will be. In other words, the pull will not be as aggressive on the start, but more gradual. The smaller the value, the more aggressive it will throttle up as switch closes.

Example: A strong 6 Litre engine may need a larger X8u to avoid a strong initial pull as switch closes.

x8d – Represents the rate of throttle down once skier stops pulling. The higher the value, the slower (softer) the throttle will return. The lower the value, the more aggressive it will throttle back.

Example: If a boat was not slowing quickly enough in the 2nd segment, you would lower the value.

Typical values 2006 Promo Boats with DBW PerfectPass

	5.7L	6.0L
x8u	85	650
x8d	275	275

ADDITIONAL INFORMATION

Jump Switch - For details on the optional Jump Switch (Slalom Switch) contact PerfectPass or log on to www.perfectpass.com .

Jump Settings

New Times (Faster Second Segment)

Examples for when towing jumpers over 120 Feet.

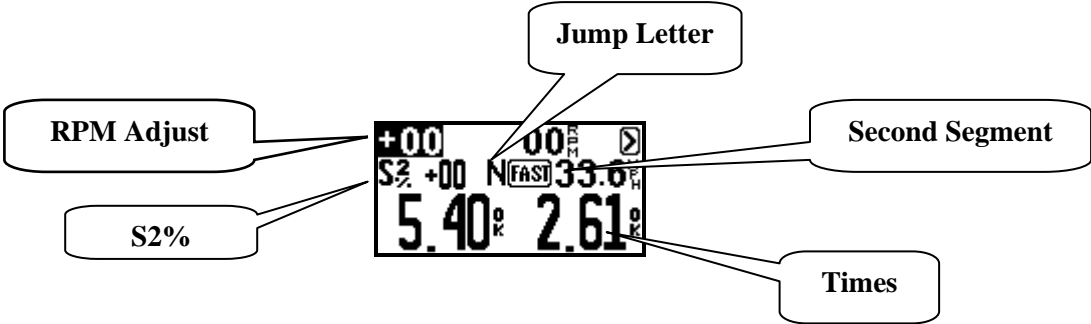
Jump Settings	S2%	S2 RTB	CT
Ski Nautique	Faster 60 – 120	Faster 10	190
MasterCraft	Faster 60 – 120	Faster 10	190
Malibu	Faster 60 – 120	Slower 5	190
Others	Faster 60 – 120	Slower 5	190

Important Tip: *Once engaged, the throttle handle should be pushed forward to provide the system with room to throttle up. For long distance jumpers, it should be moved to full open.*

Tournament Mode – Jump

If you press the Up & Down Keys together while in jump mode, the new Tournament Mode will appear. The only difference in this mode is the screen layout, particularly the size of the timing data.

Baselines should be set and established in standard jump mode.

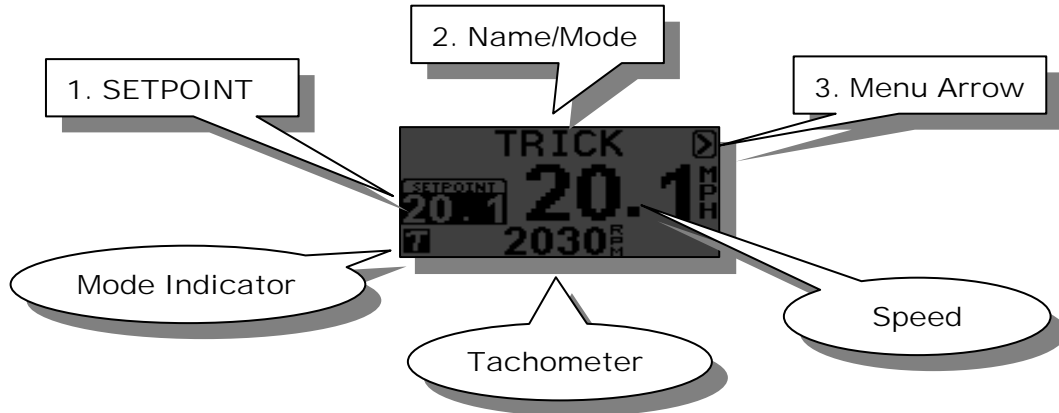


Section 4. TRICK MODE

USING TRICK MODE

The trick mode is controlled via the speed signal from the paddle wheel. (You simply select the desired speed and go. RPM values are not used and no other settings are required)

The main Trick screen will appear as:



1. SETPOINT

The speed at which would like the boat to engage and control. This number is adjusted in 0.1 mph (0.2 kph) increments. It can be adjusted while engaged (“on the fly”), or before it is engaged.

2. Name/Mode/Crew

This section of the screen displays either the Mode Name or a Skier’s Name pulled from the Name List. Press UP key to access the Name List:



Name List is discussed in Section 10.

3. Menu Arrow

Press UP key to change modes or mode settings:



As mentioned above this allows you to change modes and mode settings. The setting for the Trick mode will be discussed below.

Press DOWN key to go to Speedometer Calibrate screen (**Speedo Cal**):



TRICK DRIVING


Using Trick mode is relatively easy. Turn control ON, select the desired speed and drive smoothly to the **SETPOINT** so PerfectPass can seamlessly take over. *If you accelerate aggressively past the **SETPOINT**, it will take the system several seconds to lock in the speed.*

You should keep your hand on the throttle to ensure it does not pull back and disengage the system. If you see the “#” sign on the screen, this indicates the system needs a little more manual throttle.


If the skier falls, pull back on the throttle to disengage system. Slowly return to skier and pull them back up again. System will take over automatically once **SETPOINT** is reached. Speed changes can be made “on the fly”.

When you are finished with the speed control, go to neutral and press the **ON/OFF** key.

TRICK SETTINGS

Trick Settings are accessed by pressing the **UP** key on the Main Trick Screen with the  highlighted. Then press the **DOWN** key when TRICK is highlighted on the Mode Select Screen.



Calibrate – Used to calibrate the PerfectPass digital speedometer readout. The procedure for adjusting this can be found in the Digital Speedometer Calibrate Section 7, Page 19. The calibration screen can also be accessed from the Main Trick Screen by pressing the **DOWN** key with the  highlighted.

Kd – This adjustable parameter controls the “firmness of the Pull”. Higher the number, more aggressive the pull. Normal range 14 – 18.

NN (Paddle Filter Factor) – NN is set at 120 and represents the “Filter Factor” of the paddle. The higher the value, the more speed samples are taken from the Paddle prior to speed adjustment. It is rare for NN to require adjustment from Factory setting. If you believe your system is more “nervous” than it should be, try raising the NN. If the speed is floating too much, try lowering NN. This value is shared with Wakeboard Mode. Adjustments made in either mode will change the value in both modes.

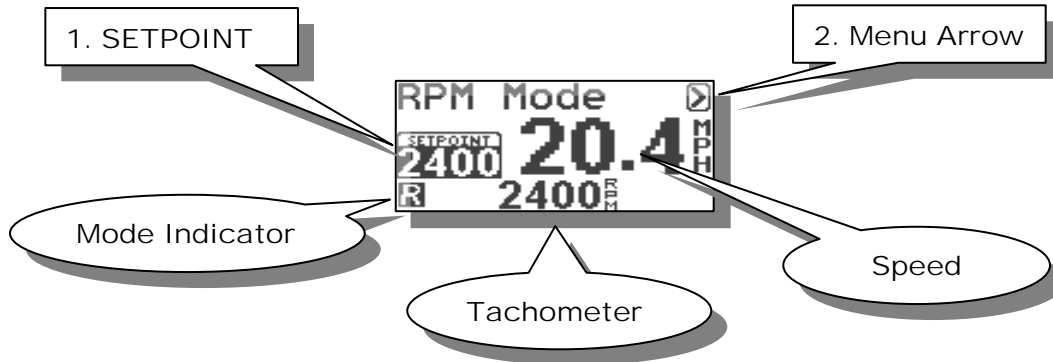
CS (Control Setting) This controls how well your system engages. (MENU and UP Key to control settings). See Section 10 for details.



Section 5. 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.

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

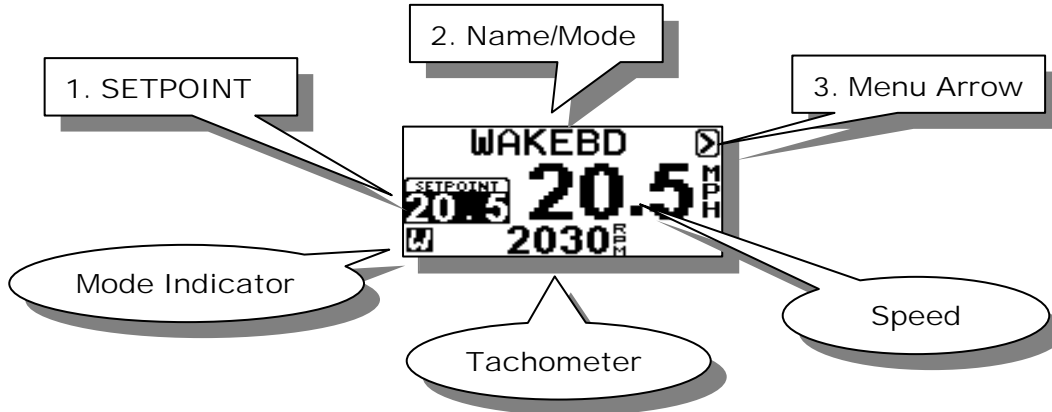
Note: You cannot enter “Names” in this mode.



Section 6. WAKEBOARD MODE

USING WAKEBOARD MODE

This is a speed-based mode using the paddlewheel to control similar to the TRICK mode. The Main Wakeboard Screen will appear as follows:



1. SETPOINT

The speed at which would like the boat to engage and control. This number is adjusted in 0.25 mph (0.5 kph) increments. It can be adjusted while engaged (“on the fly”), or before it is engaged.

2. Name/Mode/Crew

This section of the screen displays either the Mode Name or a Skier’s Name pulled from the Name List. Press **UP** key to access the Name List:



Name List is discussed in Section 10.

3. Menu Arrow

Press **UP** key to change modes or mode settings:



As mentioned above this allows you to change modes and mode settings.

Press **DOWN** key to go to Speedometer Calibrate screen (**Speedo Cal**):



Details Section 7.

DRIVING WAKEBOARD

Select the desired **SETPOINT** by pressing the **UP** or **DOWN** keys. Pull the rider up normally and accelerate smoothly up to or slightly beyond the target speed. Once PerfectPass sees the actual speed reach the **SETPOINT** it will automatically take control and will notify you of this with an audible beep. (Top line will become highlighted during engagement).

While in engaged the WakeboardPro should hold a smooth steady speed in a straight course down the lake. The driver should keep their hand on the throttle for safety, and to prevent it from pulling back on its own which will cause PerfectPass to disengage.

The key to driving is to smoothly drive to the SETPOINT so the system can seamlessly take control. If you accelerate aggressively past the **SETPOINT** it will hunt around for several seconds before settling in. You will hear an audible beep when the system automatically takes control. If the rider falls, simply pull back on the throttle and the system will disengage.

To Disengage System: If the rider falls simply slow the boat down. This will disengage speed control. Return to rider slowly and pull up again. System will once again take over when **SETPOINT** is reached.

Turns / Over-riding the system: As the boat enters a turn, the engine RPM may increase to keep the craft at the **SETPOINT**. If the driver would like less throttle (so the rider does not get whipped) then simply pull back some on the throttle and help the system maintain a safe speed. As you complete the turn, move the throttle gently forward and the system will re-take control. (The driver can override the system at any time by pulling back or advancing the throttle).

Wake Surfing in Wakeboard mode is excellent in the 9 – 11 mph range. Prior to using your boat for wake surfing, check with your boat builder or dealer to confirm it is safe for this sport.

WAKEBOARD SETTINGS

Wakeboard Settings are accessed by pressing the **UP** key on the Main Wakeboard Screen with the **☐** highlighted. Then press the **DOWN** key when WAKEBOARD is highlighted on the Mode Select Screen.



Calibrate – Used to calibrate the PerfectPass digital speedometer readout. The procedure for adjusting this can be found on Page 19. The calibration screen can also be accessed from the Main WAKEBOARD Screen by pressing the **DOWN** key with the **☐** highlighted.


KdW (Pull Characteristic) - KdW can be changed using the **UP** or **DOWN** keys with it highlighted on the screen. Higher values = more aggressive control response. Factory setting is 80. (Example: Heavily loaded boats may need a higher value to maintain a steady, crisp pull. Try 100– 150). After adjustment, press **MENU** to proceed. (Maximum recommended setting 200).

NN (Paddle Filter Factor) – NN is set at 120 and represents the “Filter Factor” of the paddle. The higher the value, the more speed samples are taken from the Paddle prior to speed adjustment. It is rare for NN to require adjustment from Factory setting. If you believe your system is more “nervous” than it should be, try raising the NN. If the speed is floating too much, try lowering NN. This value is shared with Wakeboard Mode. Adjustments made in either mode will change the value in both modes. (Normal range 80 – 150).

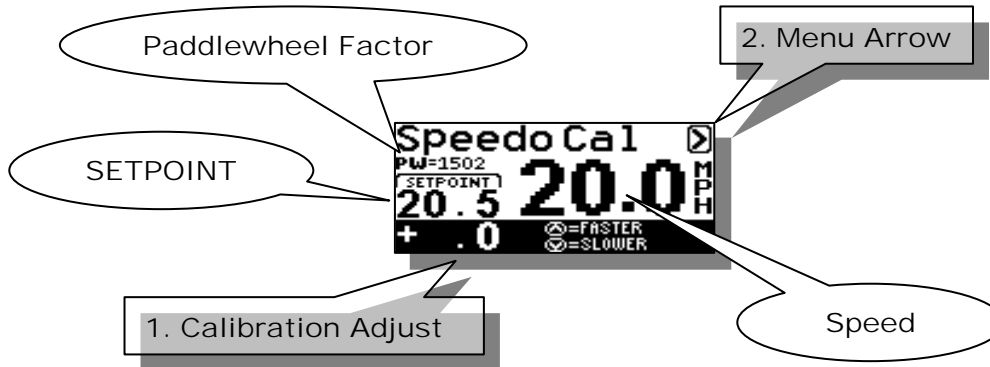
NOTE:

CS (Control Setting) This controls how well your system engages. (MENU and UP Key to control settings). See Section 10 for details.

Section 7. CALIBRATING PERFECTPASS SPEEDOMETER (Trick / Wakeboard)

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 Trick or Main Wakeboard Screen – Trick and Wakeboard Modes



There is one speedometer calibration value for Wakeboard and Trick Modes: (If you calibrate in Trick Mode, Wakeboard is adjusted as well). If you calibrate, we recommend you do so 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 20 mph, but the analog speedometer or GPS is reading 22 mph, go into the **Speedo Cal** screen and press the **DOWN** key several times until the boat speed drops to 20 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 8. INTEGRATED TIMING

USING INTERGRATED TIMING

An integrated timing system is another unique feature of PerfectPass. This timing system is set up for both the Slalom and Jump modes. For tournament skiing and in Jump mode **timing must be used and be interfaced into the Master Module** for PerfectPass to work properly.

The system has been loaded with the USA Water Ski / I.W.S.F. Record Capability time tolerance chart for the Slalom and Jump modes. At the end of each timed pass the display will briefly display the full course time. It will then show the 1st and 2nd segments and variance from actual. To review the times again, simply press the **MENU** button to highlight the timing section of the screen. The system always resets after a few seconds. If the skier has fallen or the run has ended early, PerfectPass will know and resets.

PerfectPass All Ball Timing – Our simplified “All Ball Timing” Method 4 is also loaded on this DigitalPro System. For operating details, see information in the Appendix at rear of manual. All Ball Timing is for tournament use only, and is not required for daily practice.

Hand Timer - The optional Hand Timer is used much like a stopwatch when you do not have magnets in your course. As you enter the course press the button, then again at the ball three timing gate and again at the exit gate. If you have a Smart Timer & magnets, the timer will pick up each magnet automatically and an audible beep will be heard.

Smart Timer - If you have a Smart Timer magnetic sensor and magnets you will not require the Hand Timer. The Smart Timer plugs into Timer 1 or Timer 2 input jack on the Master Module. If you do not have magnets in your course, disconnect the Smart Timer and plug the optional Manual Hand Timer into Timer 1 or Timer 2. If you have magnets and a Smart Timer, you do not require the Hand Timer.

PLACING SMART TIMERS

The sensor should be placed as close as possible to the outside of the boat. Typically the sensor is beside and under the passenger seat in a dry location. The Velcro should hold it firmly on the carpet. Place the timer in the direction as indicated on the Timer label to match the polarity of the magnets. If you are using 2 Smart Timers they should be lined up evenly so they are across from each other in the boat.

In tournament use it is recommended that two Smart Timer pick-ups be used. One will be plugged into Timer 1 and the other into Timer 2. Both Timers should be used to test the strength and polarity of jump magnets.

Note: For the jump event and for all buoy timing (ABT) you may require two Smart Timers, one located on each side of the boat. Both will plug into the Master Module. If using one Smart Timer you may have to move it to the driver’s side depending on where your magnets are located.

Note: Some two way radios operating **from the towboat** can activate the timing system. In tournament conditions **only** press the talk button and communicate with shore officials before the boat is up to **SETPOINT** and after it has exited the course.

Note: Whether using the Hand Timer or Smart Timer magnetic sensor, they will not operate or register a signal unless the boat is up to **SETPOINT** and system has engaged. This feature helps to avoid false triggering.

Note: Smart Timer is designed for tournament skiing under tournament conditions. In other conditions such as **lake cruising it will likely false trigger** if you engage the system in Slalom or Jump mode. In this case you may wish to disconnect the Smart Timer when not in tournament like conditions.

False Triggering - To reduce the chance of false triggering, drive a few miles per hour below the **SETPOINT** after exiting the course and during the turning route between passes. If you are not dropping skiers between passes do not fully accelerate to SETPOINT until you have passed through the boat wakes from the previous pass. (Smart Timer will not accept signals until speed control is engaged). **In the event the timer false triggers outside the course and system is engaged, press the UP key to clear timer.**

INSTALLING COURSE MAGNETS

Magnets should be placed as close to the surface as possible for the most accurate and reliable timing.

It is very important that all timing magnets in a given course have similar field strengths and all have the same polarity (North Pole facing up). With the same polarity each magnet will generate the timing trigger pulse exactly at the centerline of the timing buoy. A reversed magnet causes this trigger point to move towards the oncoming boat, this change in trigger location can be as much as four feet. At the higher boat speeds these timing errors can cause a perfectly in tolerance pass to become an out of tolerance re-ride. With a reversed magnet this error is also affected by boat path, depending upon which magnet is reversed either one or both timing segments can be affected.

If you are unsure about the actual polarity of your magnets and are not getting the REV message, then make a pass with the Smart Timer arrow pointing towards the bow and make a note of the values displayed. Then reverse the direction of the Smart Timer sensor by pointing it towards the stern and make another pass in the same direction. The correct direction to point the Smart Timer is the direction, which produces the largest field strength values.

Jump Magnets: *It is very important that no other magnets are present in the course other than the official jump course magnets. For example, if the jump course runs next to the slalom course any slalom course magnets that could trigger the jump timer should be removed.*

For quality magnets contact PerfectPass at (902) 468-2150.



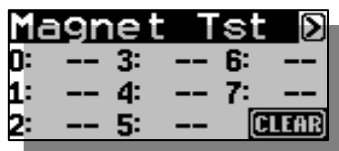
Section 9. MAGNET TEST MODE

TESTING MAGNETS

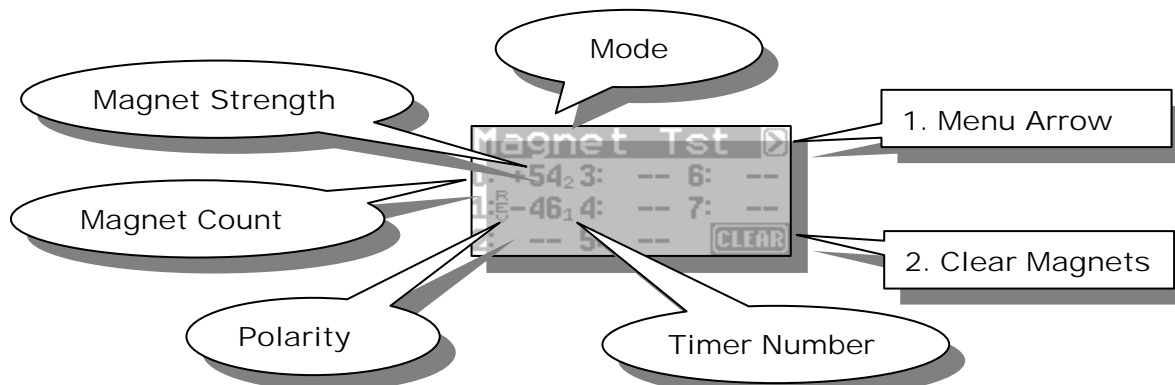
This mode allows you to test the timing magnets in the slalom and jump course for field strength and polarity. This mode uses a set RPM value (approximately 3080 rpm) to control. If you are running “All Ball Timing” or are in the jump mode, you should check that both of the Smart Timers are detecting properly, to do this you may need to drive the boat beside the course to test each sensor alone. Your test can and should be done in both directions through the course.

Note: Sitting with engine OFF in this mode will indicate if any of your timers are overly sensitive or if something in the boat is causing a magnetic signal. With engine ON and boat at idle, the timers may trigger due to alternator noise. On the fly, you can press “Clear” and complete testing.

The boat is brought up to the set RPM to engage the system and the boat is driven through the course. After engagement the screen should appear as follows:



Drive a split boat path and note the magnet strength readings. After passing two magnets using 2 Timers the system could display a message similar to the following:



Timer Number- indicates the timer which has been triggered (labeled on Master Module “Timer 1” or “Timer 2”).

Polarity - In the above example, **MAGNET #0** indicates a correct positive polarity “+” with a good strength of 54 from Timer 2. **Magnet #1** shows a Reversed Magnet with a negative polarity “-“ from Timer 1. A weak reversed magnet may only display the “REV” without the “-“ sign in front of the strength. **NOTE:** A very large or strong magnet can saturate the sensor and cause the “-“ message to occur incorrectly. In this case move the sensor towards the middle of the boat by about 16 inches and retest. Your test can and should be done in both directions through the course.

Magnet Count – Indicates the order each time a magnet is detected. Counts from 0 to 7 then scrolls back around to 0.

Magnet Strength – indicates the strength of a particular magnet. Acceptable values for magnetic strength are 30 or greater. Values below 30 may not produce accurate times. To have extremely accurate times, it is best that all magnets have a similar strength (usually within 5). You can drive back through in the opposite direction and should see similar readings. Sometimes you may need to unplug one sensor and test each one separately or run slightly wide and then slightly narrow in order to separate the sensor readings.

Understanding Magnet Test Results

One or more (not all) magnets are showing a low values or “-“ polarity

- Check the depth of that magnet.
- Check magnet polarity. See ‘Placing Magnets’.

All magnets are showing low values

- Check the depth of that magnet.
- If this course is known to be good, the Smart Timer may be failing.

All magnets are showing “-“ polarity

- Check direction of the Smart Timer. Possibly needs to be reversed.

Section 10. ADDITIONAL FEATURES (Menu & UP Keys together)

Additional PerfectPass features are accessed by pressing the **MENU & UP** keys together from any main screen. 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.

SCREEN CONTRAST

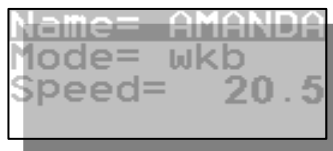
You can adjust screen contrast by pressing UP or DOWN Keys. (Setting 0-5). In bright sun, you may have to use a smaller value to improve visibility.

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 Name 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”.

CS & CR (Control Settings)

CS is a control parameter for the speed based modes. (Trick, Wakeboard and under 24 mph Slalom) This adjustable parameter allows you to tune the engagement of the system so it is ideal for your boat. Heavily weighted boats may need a higher CS to engage and control properly. Factory value on DigitalPro is about 750.

Example:

1. You are set for 22 mph, but system overshoots and goes to 26 mph before settling back. CS should be lowered. (Try adjustments of 20 at a time)
2. You are set for 23 mph, but boat will not get to 23 mph and engage. CS must be raised to allow for a faster engagement point.

CR is for RPM modes including slalom & jump. Factory setting about 1800.

Example:

1. If your system in slalom will not engage at 34.2 mph, raise CR value.
2. If system overshoots speed to far before engaging, lower the setting.

Throttle Override ON/OFF - Some boats have throttle override capability. This means if you advance the throttle once PerfectPass is engaged, the boat speed will move ahead to where the handle is positioned. For PerfectPass to regain control, you must pull the throttle back to the previous position. Throttle override can be used by expert drivers for “Double Up” maneuvers. **For most users, we recommend override be left in OFF position.**

XU – Throttle Override Setting

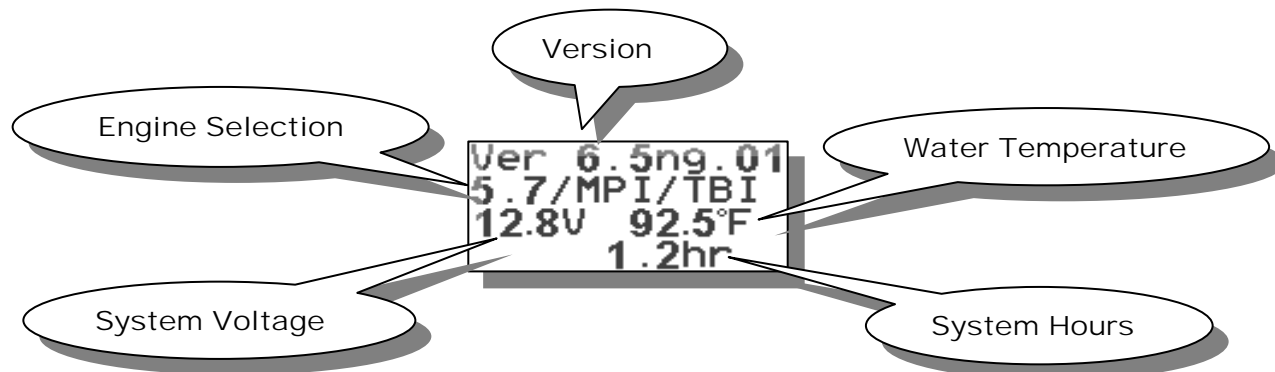
If activated on your boat, this allows you to advance the throttle while PerfectPass is engaged and override the system. The value range is 3 – 6, normal is 4.

The higher the XU value, the more aggressive override is once activated.

If you use override, you must pull the throttle back to its former position for it to re-take control.

SYSTEM INFO



General system information can be found here. The software version, engine selection, system voltage, system hours, and water temperature (not equipped on all boats) can be found here.



NOTE - System Hour and Water Temperature are only available on limited boats)

DEVICE TEST (Rope Switch, Servo Motor) (MENU and UP Key together)

Other test features such as Jump Switch Testing, Voltage Supply Testing and Servo Motor Testing are found here via MENU and UP Key. Test mode or through the SUBMENU. These tests can be performed with or without engine running. PerfectPass must be switched ON.

Rope Switch Test – This feature allows you to test the rope switch to be used prior to a tournament and will appear as [ROPE SWITCH TEST]. Pull hard on the rope to close switch and it will change to [ROPE SWITCH ON] and there will be an audible beep to confirm proper operation. Since it takes 250 pounds of force to trigger a Slalom Switch, it is very difficult to do. The easiest way to confirm operation is to ski with it and watch the  symbol in the upper right corner. This symbol will turn into  when the switch is activated.

Servo Motor Test – After Rope Switch Test, Servo Test will appear as follows:

SERVO TEST	
CONTROL	1.0
R	00 RPM

(Refer to Trouble Shooting Section for details).

Section 11. TROUBLE SHOOTING (Electronic Throttle Engines)

The PerfectPass “Drive by Wire” (DBW) system for new electronic throttle engines results in a simplified and enhanced version of PerfectPass. From the drivers seat, PerfectPass operation is virtually identical to the present mechanical systems. PerfectPass is now comprised of just four main parts:

1. DBW Master Control Module
2. DBW Plug & Play Engine Wiring Harness
3. Plug & Play Display Harness
4. In-Dash Display

Servo motors, throttle cables, etc. are not required on these engines. On 2006 MCX and RPT, an “ALDL” ground plug is required. On the 6.0L and 8.1L, a re-flash is required.



Engine
Harness

Display
Harness

How it Operates:

The ECM of an electronic throttle engine allows an external device such as PerfectPass to control the engine rpm using the throttle servo motor when all control signals are valid and manual throttle lever position exceeds the rpm level request of PerfectPass.

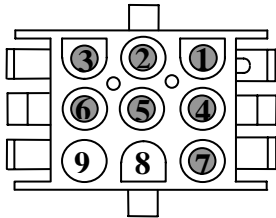
Just three individual wires in the PerfectPass DBW wiring harness connect the speed control to the engine ECM.

1. The **Request Line** from PerfectPass requests the ECM to allow PerfectPass to take control.
2. The **Status Line** from the ECM indicates PerfectPass now has control of the engine. The Status Line is the signal that confirms engagement (beeper) and system control.
3. The **VGOV Line** establishes the engine RPM level as set by PerfectPass.

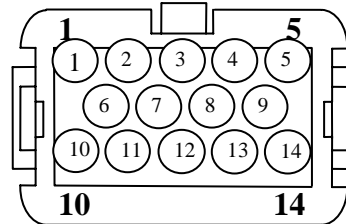
Problems with PerfectPass should be rare given the few components that now make up the system. Most trouble shooting will simply involve voltage/continuity testing on the PerfectPass engine harness.

Wiring Identification

2007 MasterCraft DBW Engine Harness



9-Pin MATE-N-LOK
(White)
Front View
Connected to
MasterCraft Harness



14-Pin AMPSEAL
(Black)
Back View
Connected to
PerfectPass Module

Signal	Color	9-Pin MATE- N-LOK	14-Pin AMP Seal	16-Pin Connector at Engine	ECM MEFI 5
STAT	Orange	1	1	D	J1-55
VGOV	Blue	2	10	E	J3-57
RQST	Brown	3	12	C	J1-30 J1-45
Ground	Black	4	14	H	
RPM	White	5	9	B	J1-24 J1-25
Speed	Green	6	8		
12 Volts	Red	7	4		

Problems with PerfectPass Controlling / Not Controlling

Open circuit (bad connection/broken wire) symptoms of a DBW System

Problem #1 RQST Line Open – PerfectPass never takes control in any mode, the engine is controlled only by the manual throttle handle.

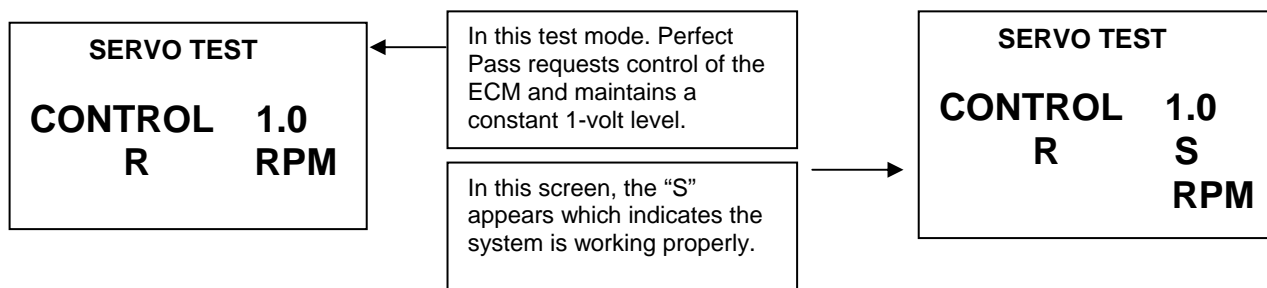
Problem #2 VGOV Line Open (RQST Line OK) – With the PerfectPass system control ON, the engine will not go above idle no matter how far the manual throttle is pushed. With PerfectPass control OFF, the engine is controlled as normal by manual throttle handle.

Problem #3 STAT Line Open (RQST Line and VGOV Lines OK) – Engine operates normally with PerfectPass control ON, the engine RPM's become limited at speed slightly above system set point, but there is no proper control and speed remains one or two mph above setpoint. The PerfectPass does not beep to acknowledge engagement and the underline characters never appear.

Problem #4 PerfectPass Does Not Engage The “S” (Status Line) never appears during control test. Check “ALDL” ground plug. If not connected properly, ECM will never give PerfectPass control. (Connects where “Diacom” plugs into harness).

TESTING (CONTROL TEST)

To enter the Test Mode, press the Menu & UP Keys together and scroll down and enter Device Test. Rope Test will first appear, press menu to enter Servo/Control Test. This test can be performed in the shop or on water.



TEST

Make sure system is in ON Mode prior to starting test. You must have an RPM reading on PerfectPass display or it will never work properly.

With engine ON, lock the gearshift in neutral and advance the throttle handle to 1800 RPM. When all is working correctly an “S” will appear next to the “R” and the engine will hold at approximately 1730 RPM (it may surge up and down by about 100 rpm). If the RPM is holding at 1730 but the “S” is not on the display, there is a problem with the “STAT” line.

If you lower the 1.0 volt setting by pressing Down Key to .7 volts, the engine rpm will drop to about 1420 and hold reasonably steady.

(If you perform this test on the water on the fly, it should hold very steady at about 1730).

If the RPM does not hold at 1730 the “RQST” line may not be connected. Either the Request Line or the VGOV Line has lost continuity.

If the engine holds RPM at approximately 1730, but the S does not appear on screen, then check continuity of the Status Line. If the test fails, perform voltage checks.

Voltage Test (Control Test Mode)

These measurements are taken in Control Test Mode with system ON and R must be on screen. This test will confirm whether PerfectPass and the ECM are properly connected.

Locate the 14-pin engine connector on the PerfectPass Module or ideally the 9-pin MAT N LOK connector on PerfectPass harness. You will need to apply test tee connectors or insert small test pins beside the wires as they exit the connector to be able to measure the voltage present on each wire. These are taken while in Control Test, with “R” on screen.

- Measure the voltage on the RQST (request line) which should measure less than 1 volt. (0 to 1 volt) Engine running or not running.
- Measure voltage on VGOV (vgov line) which should measure about 1 volt. (.8 to 1.2 volts) Engine running or not running.
- Measure voltage on STAT (stat line) which will be 10 + volts when **S** is not on display. (When engaged and working properly this pin at ECM is grounded and voltage will be less than 1 volt.) Engine must be running for any measurement on STAT line.
- Press the OFF key and the “R” will disappear. Now measure voltage on RQST wire again which should now measure more than 10 volts, this confirms proper operation of PerfectPass Request driver and ECM connection.

Other Measurements:

With control OFF and R not on Screen:

- RQST Line – 4.5 V
- VGOV Line – 4 V +
- STAT Line – 10 V +

Trouble Shooting DBW

Problem – System shows rpm & speed on Display, but does not engage & take control.

Check- *Perform Open Circuit tests as described on previous page.
If system is new, confirm you have the “ALDL” plug installed.*

Problem – No speed reading on PerfectPass Display

Check – *Paddle wheel signal on green wire coming into the Master Module on Amp Seal Connector. If paddle is spun slowly, you should see 0 volts / 12 volts as wheel slowly turns. As wheel is spun quickly, you will see an average of 6 volts. (If voltage is good, perform a “System Reset”).*

Problem – No rpm reading on PerfectPass display

Check – *The RPM signal wire at the Amp Seal connector coming into Master Module. With engine off you should see about 9 volts. (With engine running, you should see a normal tach pulse signal) If no signal, check the pin at ECM.*

Problem – PerfectPass in Wakeboard mode is set at 22 mph and digital speedometer shows 22, but actual speed is 24.

Check – *Use Menu Key to highlight Menu Arrow Icon and press Down Key to reach “SPEEDOMETER ADJUST”, quickly press down key several times and lower speed by 2 mph. All Wakeboard speeds now calibrated.*

Problem – Key is on, but PerfectPass screen does not become active and show data.

Check – *PerfectPass requires 12+ volts for start up. Check voltage on red wire (12 v) power source to Master Module.*

Problem – Button on PerfectPass Display does not work.

Check - *If system was just installed, unplug Display from harness and inspect all brass pins on connector to ensure they are inline. If problem occurs after much use, the Display will require repairs by PerfectPass.*

Problem - System not smooth in RPM Mode.

Check – *Confirm whether the correct engine selection was made on initial set up. Press Menu & Up keys together. Menu through until “System Info” appears. It will show either [5.7 / MPI] or [6.0 / 8.1] If it was selected incorrectly, do a System Reset and select properly.*

Problem – In Wakeboard/Trick mode, system sluggish or exhibits some surging.

Check – *Inspect paddle wheel. If paddle appears OK, go into adjustable parameters by highlighting menu arrow icon, press UP and Wakeboard will appear. Press DOWN for settings.*

KDW will appear. *This value represents how firm the system will control. Heavily loaded boats may need higher settings. (Typical values 60 – 200) Press Menu to proceed.*

NNW will appear. *This is the filter factor of paddle. The higher the value, the more filtering is done prior to making a speed change. (Typical values 80 – 180)*

Trouble Shooting DBW (Continued)

Problem – The boat accelerates past set speed too far in Wakeboard Mode before settling in.

Check – Go to “Control Settings” and lower the “CS” value.

Software Adjustments

System Reset – To reset the entire system back to original factory values, press & hold ON/OFF & MENU Keys together as you turn key on to power PerfectPass. Continue holding for a few seconds until [System Reset ^ = Yes] appears. Then simply answer questions as they appear.

Switching WakeboardPro <> DigitalPro – If your system was selected incorrectly, perform a system reset. As you proceed through this process, you will be asked [Wakeboard Only ^ = YES]. Answer YES for WakeboardPro, and NO for DigitalPro

Engine Selection – On initial start up or during a system reset, PerfectPass will ask if you have a standard 5.7 litre engine. This will appear as [5.7 / MPI ^ = Yes] This means press UP for 5.7 and DOWN for Big Block 6L or 8.1L.

To confirm if correct engine was selected, press Menu & Up Keys together to get into back ground screen and go to “**System Settings**”. Following battery voltage, etc you will see which engine was selected. If incorrect, perform a system reset.

(An incorrectly selected engine can cause unsettled control in rpm mode only)

WakeboardPro to/ DigitalPro – The Master Module for both systems are identical. The only difference is in the way they were initialized, i.e.: As a DigitalPro or WakeboardPro. You can change the way it was set by performing a system reset.



APPENDIX

PerfectPass All Buoy Timing Version 4 IWSF Approved 2001

The All Buoy Timing Method (ABT) eliminates the need for a fall button. In Tournament Use, after a skier falls or misses during a pass, the boat is timed to the next set of boat gates. Because the boat travels only a relatively short distance before the time is measured, the boat speed does not change significantly. Thus the time is an accurate measure of the speed of the boat while pulling the skier.

If the skier runs a full pass, the full course time is used to determine if the boat speed was within tolerance. For scores less than six, a chart showing the timing tolerances for each buoy score is used. This method uses the cumulative time from the gates up to the last ball scored. With this approach, only one segment time is required.

After each pass, the PerfectPass system briefly displays the Full Course Time and then the two separate segments as in this 34.2 mph example. [**0.0 16.95 OK**] then [**7.13 9.82 OK**] If the score was less than six, then the ABT sub-menu is entered via the Down Key. The times are displayed in pairs preceded by the score identification and a colon. (Press any key to take you to the next set of scores). **For example:** if the score were four and a quarter, you would scroll through the ABT times until the 4 ID is found which would appear as: “ **4: 12.50 5: 15.19** ” The time of 12.50 would be called in. For a score of one and a half the display showing “ **0: 1.77 1: 4.45** ” is used and only the 4.45 time is reported. All of the existing rules for optional and mandatory rerides are applied to the ABT times. *(The guide is to always refer to the time segment corresponding to the score. Example: If the score starts with a 4 you look at the time following the 4 and call in that time only.*

Magnets: A minimum of eight magnets and two Smart Timers are required to run ABT, a course with ball one magnets had eight magnets already, two are on the entrance and exit gates and two Smart Timers are required for the jump event, so for many sites the equipment necessary to use ABT already exists.

(Check with our website at www.perfectpass.com for more details).

PerfectPass All Buoy Timing 36mph/58kph IWSF approved method 4

<u>score</u>	<u>score id.</u>	<u>fast in</u>	<u>actual</u>	<u>slow in</u>
0 to 0.5	0:	1.64	1.68	1.71
1 to 1.5	1:	4.15	4.22	4.28
2 to 2.5	2:	6.67	6.77	6.84
3 to 3.5	3:	9.20	9.31	9.41
4 to 4.5	4:	11.73	11.86	11.97
5 to 5.5	5:	14.25	14.40	14.53
6		15.92	16.08	16.22

PerfectPass All Buoy Timing 34.2mph/55kph IWSF approved method 4

<u>score</u>	<u>score id.</u>	<u>fast in</u>	<u>actual</u>	<u>slow in</u>
0 to 0.5	0:	1.73	1.77	1.80
1 to 1.5	1:	4.37	4.45	4.51
2 to 2.5	2:	7.03	7.13	7.23
3 to 3.5	3:	9.69	9.82	9.93
4 to 4.5	4:	12.35	12.50	12.64
5 to 5.5	5:	15.02	15.19	15.34
6		16.78	16.95	17.12

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 competitive 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)

