AeroMarine Research
TBPNews - Performance Report

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TBPNews #126 – January 20, 2009

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>>>> **Tunnel Boat Performance News** >>>>>> (over 5000 members!)

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In this issue:

******************** TBPNews *******************

1) Mercury Racing Powers Team Amsoil to New Cat Lite World Speed Record

Paul Whittier and veteran throttleman Bob Teague recently piloted Team Amsoil #77, a Skater 368 catamaran powered by twin Mercury Racing 525 EFI engines coupled with Mercury Racing dry-sump Six drives and Mercury Racing CNC cleaver propellers, to set a new POPRA (Pacific Offshore Powerboat Racing Association) Offshore Cat Lite World Kilo Speed Record at 131.981 mph.

Kilo speed records, certified by the American Power Boat Association (APBA) and the Union Internationale Motonautique (UIM), require back-to-back speed runs over a straight-line, one kilometer course. The record is the average of the two consecutive speed runs. The combination of below-sea-level air density, extremely high salinity in the water, cool desert air and a perfectly undisturbed body of water made the perfect formula for world record-breaking speeds. Team Amsoil's first run on Saturday proved to be good enough to break the previous Cat Lite world kilo speed record of 126.703 mph. Teague and Whittier tried various propellers and set-ups throughout the day in attempt to better their speed. By the end of Saturday, the new speed record stood at 131.319 mph. On Sunday, Team Amsoil was successful once more at breaking their own speed record for the new record of 131.981 mph, certified by APBA/UIM.

See more at: gulfnews.com and douglasskater.com

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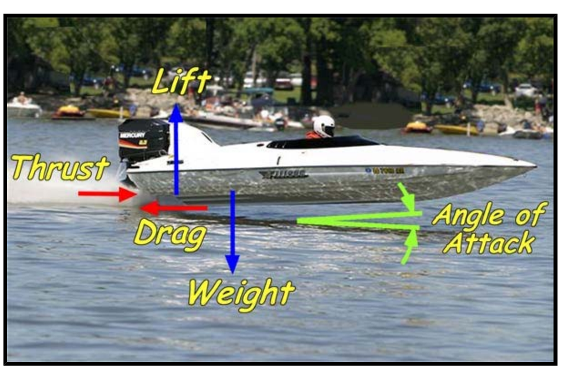
2) Feature Article - "*Why Does a "Pad" Make a Vee-hull Faster*?"

[excerpts from Jim Russell's full article "The Bottom Line"]



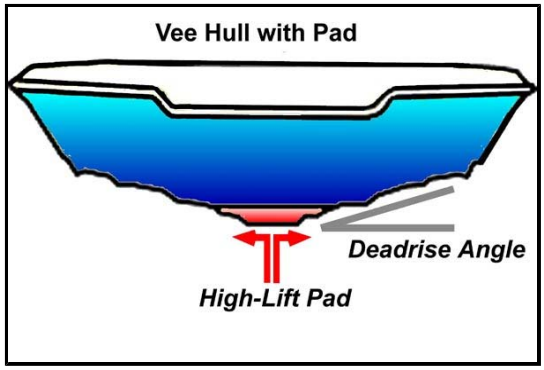
The V-bottom is the most common design of hull in modern performance powerboats. A shallow V design will generally produce more hull Lift and consequently, a corresponding increase in ultimate boat speed. The shallow V, however, is generally not as desirable for running in heavy waves, as it tends to cause the boat to "skip" across the waves, causes a rougher ride, and in extreme cases, a loss of control.

The deeper "V-bottom" boat is the most common of present-day performance Vee hull designs. This design offers a good ride in rough water as the "V-shaped" bottom softens the up-and-down movement (pounding, rough ride in heavy waves). The degree of the angle of the "V" is called "deadrise."

Some "V"-hulls have an additional flat aft surface called a "Pad." This Pad allows a more efficient planing surface aft and an increase in top speed. There is a corresponding sacrifice of some ride softness but with this modified Vee-type hull design, super-fast speeds are achievable!

Pad Design - The Pad is a relatively flat planing surface added to the aftmost section of a Vee hull. The Pad usually extends sufficiently forward so that the transition from the Vee to the flat running surface is gradual.. This smoothes out pounding through heavier waves and more gradually transfers lifting load to the Pad as the hull accelerates. Some high-performance Pad-Vee designs extend the flat Pad to the front of the hull bottom with the intention of initiating planing on the flat Pad surface as early as possible – and tolerate a rougher ride in heavy water conditions.

The Pad Vee has several performance advantages:



Balancing Act - the high-performance Vee-bottom can be a real challenge to drive at high speed. Deeper Vees (15° – 20°deadrise) must be balanced on a thin keel edge, often exhibiting an unsettling lateral instability, as it "rocks" from side to side. The Pad provides a somewhat wider platform on which the hull will ride – making it easier to balance at higher speeds. Admittedly, some drivers will argue that the "balancing act" with a Pad-Vee hull can generate an even more dramatic ride – particularly at speeds around the transition from Vee hull surfaces to riding solely on the balanced Pad. The hull can ride smoothly when balanced on the flat Pad, but when the hull "falls off" the Pad, rocking to one side or the other side, the effect is more dramatic, to be sure. (*Ed. Note - AR performance hull software can predict when this 'Pad-walk' instability will occur*)

High Lift - The flat Pad generates much more efficient Lift than the Veed bottom shape. Theory of hydrodynamics dictates that a steeper angle of Vee (for example 20 degrees) or "deadrise", creates less Lift than a shallow angle of Vee (say, 10 degrees). The extreme case of the completely flat Pad that has a zero (0 degrees) deadrise creates very high Lift for it's small wetted surface area. The result of this "extra Lift" is a dramatically reduced hydrodynamic Drag. Less Drag means more speed!

Transition Lift - During acceleration mode, the Pad Vee hull gets Lift from the Vee-hull sections as well as the flat Pad section. It needs this entire lifting surface to Lift the weight of the hull at lower velocities . As speed increases, so does the Lift, and the amount of wetted surface required to Lift the weight of the boat is reduced. As the speed increases further the required Lift is generated largely by the flat (more efficient) Pad and less by the Vee (more drag) surfaces. Eventually, the hull reaches a velocity where the "Pad" alone can generate sufficient Lift to float the hulls entire weight. Experienced Pad-Vee drivers will recognize the "pop" that occurs when the hull reaches that special velocity where the hull "breaks" away from the Veed lifting surfaces and rides on the Pad alone. (*Ed. Note - AR performance hull software can predict when this 'break-away' to Pad support will occur*)

Less Trim - Because the Pad is a more efficient lifting surface, the angle of attack required to generate weight-balancing Lift, is less than it would be if the Lift were generated by a higher deadrise Veed hull surface. This lower angle of attack makes the setup and operation of the boat more stable. When the "pop" occurs (Lift transition from Veed surfaces to Pad surface only), some hulls will noticeably "nose-down" to a lower angle of attack, due to the more efficient Lift generated by the Pad.

Setup is important - particularly weight distribution, because the boat must balance on the Pad. Since we have to balance the hull on only a narrow Pad at high speed, there will always be some tendency for the hull to "fall off" to the unbalanced (heavier) side of the boat. Fuel tank, oil tank, battery and even passenger location can be adjusted to help balance the running setup and help stability of the hull at high speed.

Less Drag = More Speed - All the Lift of the hull must counterbalance the total weight of the hull. Think of it this way – not enough Lift and the boat sinks – too much and the boat flies! So just the right amount of Lift is pretty important. This Lift is created by the forces generated by the wetted surfaces (hull bottom), planing on the water surface. But with that Lift, comes some Drag - and that Drag must be offset by engine thrust – horsepower. So more Drag means more horsepower required to achieve the same speed.

If we consider the example of a high-performance deep Vee hull, we will see how the addition of a Pad can increase speed. A 1700lb hull with a 20-degree deadrise Vee hull design could achieve 90 mph. The drag generated by the creation of Lift would be about 1135lbs. The same 1700lb hull with a 12" wide flat Pad would generate less Drag because of the better efficiency of the Pad design - and this reduced Drag represents nearly +60 hp! So, our example can achieve the same speed for less power, less fuel consumption. Alternatively, speed-hungry powerboaters could take advantage of our full

power capability and turn that efficiency into more speed!

There is much that can be done to optimize the Pad design. Performance powerboat designers consider hydrodynamic Lift & Drag of the running surfaces as well as the aerodynamic Lift & Drag of the hull design and optimize with power available. Dynamic stability is affected by the delicate relationship of all of these forces at various speeds. It's a tricky balance of design issues, but for a high-speed Vee hull design - a Vee-Pad can result in more speed!

Get *Jim Russell's* full article *"The Bottom Line"*.

See more Performance Articles at: http://www.aeromarineresearch.com/articles.html

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3) ChampBoat 2009 Season Campaign Calendar

The 2009 ChampBoat Series announced plans after its annual ChampBoat business meeting. The group will be adding new locations such as Boston and Minneapolis.

With sponsorship pending at a few of the races, a tentative 2009 schedule was released that includes some staple locations as well as some new ones.

2009 Tentative Schedule: May 16-17, Nashville; June 20-21, Evansville, Ind.; June 27-28, Bay City, Mich.; July 3-4, Pittsburgh, Pa.; July 18-19, Minneapolis; Aug. 1-2, St. Louis; Aug. 15-16, Boston; Sept. 19-20, San Diego; Sept .26-27, Tempe, Ariz.; Oct. 24-25, Naples, Fla.

For more information, be sure to check www.champboat.com for updates

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4) American Powerboat Television Launched

If you are into offshore racing, you can check it out any time thanks to a new Web site launched by American Powerboat Television. Americanpowerboat.tv allows viewers to sort among a variety of programming options, including coverage from Offshore Super Series, Super Boat International/APBA, Powerboat P1 and selected poker run events.

The site is powered by Endavo Media's interactive video player. Along with technical features, product showcases, classic offshore races and kilo runs, the site will also broadcast live selected OSS races during the upcoming season. Viewers have the option to participate in online forums related to each specific program and share their favorite individual shows with friends through APBTV's proprietary file-sharing program.

For more information on APBTV, or to view a full list of programming choices available through the network, visit

Check out more at www.americanpowerboat.tv

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5. Hydroplanes set to return to B.C. this summer

British Columbia will once again play host to the spectacle of Unlimited Hydroplane racing when the fastest boats on the planet return to British Columbia, Canada on August 8 and 9 in Kelowna. When hydroplanes last raced across the surface of Okanagan Lake in 1999, the weekend-long event was called Thunderfest and organized by a company unrelated to

Sports for All Management.

These boats achieve speeds of 354 kilometers an hour while literally flying across the water; this makes these races one of the most exciting sports events on water or land. The event in August 2009 is a partnership between Sports for All Management and the American Boat Racing Association (ABRA) which sanctions the full Unlimited race series. While the 2009 event will not award points towards the full race championship, spectators and media will see many of the teams that race for the series across the U.S.A. compete on Okanagan Lake.

check out more at: abrahydroplanes.com

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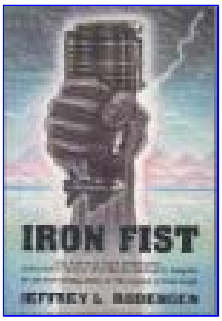
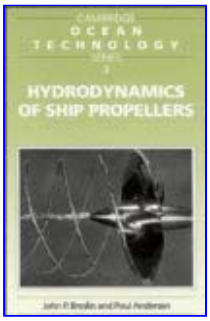
6) NEW Powerboat Design Books On-line





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7) 2009 "Motor Wizard" Update for TBDP and PropWorks2

New 2009 Motor Wizard update (AeroMarine Research®)- Now over 750 engine selections in Motor Wizard database! New 2009 engine spec's. [*Included with "Tunnel Boat Design©" software & PropWorks2© software*]. Use the New 2009 Motor Design Wizard to easily input the dimensional information for your setup. Just select your OEM engine manufacturer and highlight your model from the over 750 listed. The published manufacturers specifications are all there - Mercury Marine, Merc Hi-Performance, Bombardier, Evinrude/Johnson, Yamaha, Suzuki, Nissan, Honda, Tohatsu, Mariner, Volvo, Mercruiser, Steyr, OMC, Volvo Penta. The OEM factory correct MaxHP, Height, Weight, RPM and gear ratios will be automatically input to TBDP V7.9 and PropWorks software V2.8. Contact AeroMarine Research® for more information or your Update!
Check it out at: aeromarineresearch.com

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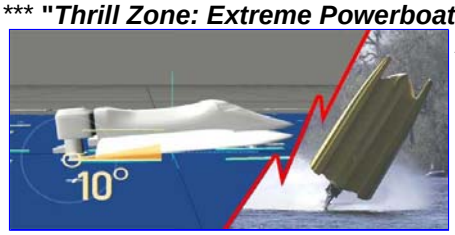
8) Powerboat Racing on TV

*** **"*Thrill Zone: Extreme Powerboats*"** - National Geographic powerboat show.



Author ***Jim Russell*** (Jimboat) is powerboat design technical consultant on a new National Geographic special for "Thrill Zone" series...

Details at: (channel.nationalgeographic.com)

check out next show date at AR's website! aeromarineresearch.com/NatGeo_thrill-zone.html

***** "*Streaming Motorsports*"** on Speedbox.tv - Parker ENZED Jetsprinting Championship - - Check at: speedbox.tv
*****"*2008 IHBA Lucas Oil Drag Boat Racing*"** Series on SPEED TV - Check next show at speedtv.com
***** "Champ Boat Grand Prix Series"** - on SPEED Channel - Check next show at: www.champboat.com or at:

www.speedtv.com
*** ***"F1 World Championship TV Show"*** on The Water Channel - See: www.waterchannel.com; [see web site for other show times]
*** ***"War On Water"*** **TV Show"** on The Water Channel - Check it out at: www.waterchannel.com; [see web site for other show times]
*** **"Powerboat Showcase"** on The Water Channel - Check it out at: www.waterchannel.com; [see web site for other show times]
*** **"Offshore Classics"** on The Water Channel - Check it out at: www.waterchannel.com; [see web site for other show times]
*** ***"American Powerboat Television"*** on The Water Channel - *See*: www.waterchannel.com or americanpowerboat.tv
*** **"Honda Formula 4-Stroke Powerboat Series"** - Check it out at: honda-racing.co.uk

[Ed. Note: The Water Channel is available on The Dish Network]

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9) Jimboat's Feature Articles

Watch for upcoming articles by Jimboat in "Performance Boats" magazine and "HotBoat" magazine!

NEW Jimboat Article Announcement! - Author Jim Russell explains '*Why Boats Create Rooster Tails*"

Check out full article at: aeromarineresearch.com

Jimboat writes Feature articles in HotBoat, Family&Performance Boating, Performance Powerboat, World of Powerboats, Extreme Boats magazines.

- 'Why Do Boats Create Rooster Tails?' - HB-August 2008
- 'What a Blow Out!' - "Gearcase & Propeller Blowout- Why it Happens & How to Fix it" - HB-June 2008
- 'Walk on the Wild Side' - "Chine Walk - Why it happens & How to Fix it" - HB-Jan 2008
- 'Hump Zone' - "Why does your Boat Porpoise?" - HB-April 2007
- 'The Bottom Line'-"Why does a Pad make a Vee Hull faster?" - F&PB-Sept 2005
- "10 Smokin' Speed Secrets Revealed..." - HB-Feb2005
- "Winterizing your Performance Outboard" - F&PB-Jan2005
- "What a Drag" - 'Trim Angle & Engine Height Can Reduce Drag and Increase Speed' - HB-Sept2004
- "10 Safety Tips" - 'Ten Safety Ideas for High Performance Go-Fast Boats' - HB-Aug2004
- "Flight Path" - 'Where does Lift Come From?' - HB-April2004
- "Rocket Science" - 'How To Increase Your Hull's Design Speed With Aerodynamics' - World of Powerboats-Winter2004
- "Tunnel Vision" - 'What Factors Influence Tunnel Hull Performance' - Extreme Boats-April2003
- "Step-by-Step" - 'Step Design in Powerboats' - TBPNews #88, October 2005

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See you next time!
/Jimboat
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[Advertisement...]

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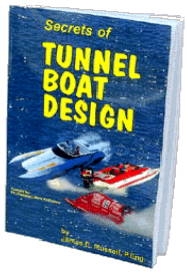

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