AeroMarine Research
TBPNews - Performance Report

Tunnel Boat Performance News - #170 - Dec 15, 2015

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This month...

Chiappe Wins Second Straight Title With 2nd Place Finish

ABU DHABI (UAE) - French driver Philippe Chiappe stayed out of harms way while watching all his rivals fall by the way side finishing second and capturing his second straight World Championship at the 24th Grand Prix of Abu Dhabi at the fifth stop on the UIM F1 H2O World Championship tour in downtown Abu Dhabi Friday afternoon...

Italian Alex Carella won capturing his third win in five races in Abu Dhabi and taking his first victory of the season. The victory has moved him into a second place tie with American Shaun Torrente of the Victory Team who dropped out when his new one week old boat failed him delaminating at the two-thirds mark of the 48 lap event while in fifth place.

Chiappe, who finished a wapping 48.54 seconds behind Carella, was runner-up for the second time this season after taking victories in Porto, Portugal and Liuzhou, China. The driver from Rouen now has 70 points on the year and an insurmountable 31 points ahead of both Carella and Torrente with just one race to be run next Friday, the 18th of December in Sharjah on the Khaled Lagoon.

Team Abu Dhabi also got a third place on the podium as well as Thani Al Qamzi who started dead last in 17th position came home third for his second straight podium of 2015 on a great run. Finnish two-time World Champion Sami Selio was fourth after leading 15 laps before having mechanical problems slowing him down at the end, a lap behind the leader. Norway's Marit Stromoy was a solid sixth after qualifying ninth in her EMIC Team boat.

Heartbreak came to early race leader Jonas Andersson of Team Sweden with him out dueling his way to the front and leading for 32 laps before falling out with mechanical problems.

The series now heads off to Sharjah for next weekend's final Grand Prix of the year with qualifying on the 17th and the Grand Prix on the 18th.

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Safehaven Marine launches Barracuda SV11 stealth boat

Workboat manufacturer Safehaven Marine is renowned for its rugged vessels, but it appears to have raised the bar with the Barracuda SV11. This 11-metre design can hit 40 knots, thanks to its twin 575hp shaft-drive diesel set-up, but it is the wave-piercing hull design that is most impressive..hull...

As the rough weather testing video below conclusively shows, this is a boat that has been built to withstand whatever Mother Nature can throw at you:

The distinctly military design, with its radar evading carbonfibre superstructure, is likely to alarm your local harbourmaster, and indeed this is no casual Solent cruiser.

Safehaven Marine's clients include the Kuwait Institute of Scientific Research and the Polish Navy, hence the option to fit a range of lethal and non-lethal weapons that can rise up through the foredeck in a fashion that would make a Bond villain jealous.

Those looking to nip around close to the shore can ditch the twin propellers in favour of MJP Ultra Jet 340 waterjets that bring the draught down to a special forces-friendly 2'9".

Inside, the Barracuda SV11 is an understandably Spartan affair, with up to four AMP bucket seats and multi-point harnesses to ensure you can cling on to the helm for dear life.

And with a 1,000-litre fuel tank you can cover 200nm before stopping to refuel and brief your spymaster. Prices and delivery details are on a strictly need-to-know basis... [more] [back to top]

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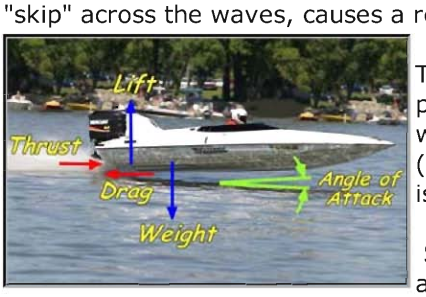
How A "Pad" Makes a Vee-hull Faster

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."

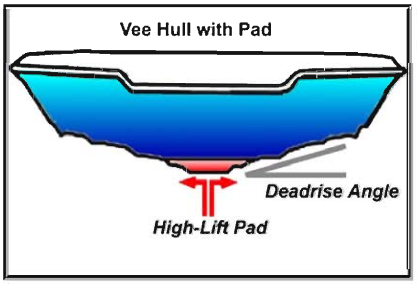
Some "V"-hulls have an additional flat aft surface called a "Pad." This Pad allows a more efficient planing surface aft and an increase in top speed. There is a corresponding sacrifice of some ride softness but with this modified Vee-type hull design, super-fast speeds are achievable!

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.

Here's How It Works - 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".

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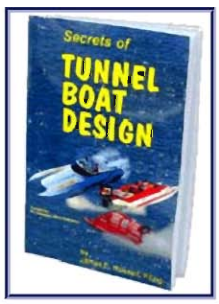
Video - The History of Tunnel Boat Racing (1969 to 1994)

On October 2nd 2013 Bill Seebold was invited to be a guest speaker to a full house at the Sunset Country Club in St. Louis Missouri. MOTO Marketing Group was asked to come by and film it at the last minutes that day and this is the final product. The sound and quality is not the greatest, but Bill's Life Long Racing Story is, so please watch and enjoy! [click for video] [back to top]

Free STBD book with TBDP/VBDP software!



Special Holiday Deal - for all TBPNews members purchasing the new Tunnel Boat/Vee Boat Design Program software - Version 8 before December 31st 2015, we'll , include a FREE "Secrets of Tunnel Boat Design" book (13th edition) by Jim Russell (USD$69 value).

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See 13th Edition "Secrets of Tunnel Boat Design" book (ISBN# 1-894933-30-3)
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