Tunnel Boat Performance News - #175 - May 15, 2016

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Chiappe and F1 China CTIC Win Rouen 24Hr

France's Philippe Chiappe made it four wins in a row after leading F1 China CTIC to a well-deserved victory in last weekend's gruelling Rouen 24hr endurance race on the River Seine.

The quartet of two-time F1H2O World Champion, Chiappe, Peter and Nelson Morin and Rodolphe Avenel, running a Moore Formula hull, eased into the race then hitting the front at the end of the second session on Saturday and leading to the chequered flag on Sunday afternoon at 17.00hrs completing 841 around a 3.8km circuit....

Chiappe was one of a clutch of F1H2O stars on show; three-time World Champion Alex Carella and Thani Al Qamzi spearheaded Team Aby Dhabi 35's debut at the 53rd running of the event, leading briefly in the first session and going on to complete a memorable weekend finishing third overall behind China CTIC and Team Cegelec Sdem Itm, and taking first in the S2 Class in their DAC. But there was disappointment for the second Abu Dhabi outfit, its challenge ending late on Saturday after a crash.

Sean Torrente teamed-up with the New Star Racing's Mikhail Kitashev, Roman Vandyshev and Konstantin Ustinov in S2, finishing fifth overall and third in class, Christophe Larigot's Team Nollet's challenge ending after 113 laps.
Read more at F1H2O.com
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Miss GEICO Racing Retools for Comeback Season

The Miss GEICO Offshore Racing Team brings a new philosophy to the 2016 powerboat racing season in what team owners expect to be a "comeback year" after a frustrating 2015.

"We've hit the reset button for the 2016 season," said Miss GEICO Crew Chief Gary Stray. The Miss GEICO team's 2016 approach includes a fresh engineering crew that will emphasize consistency and reliability instead of wringing more and more power out of the engine platform on the 50-foot-long Victory catamaran.
The organization had regressed from winning multiple world championships on the Super Boat International (SBI) and Offshore Powerboat Association (OPA) circuits to struggling to finish races in 2015. "Last year, we had issues that were plain to see," Stray shared.

Scott Colton, Team Manager, said the team will start the season with four identical race engines, two on the boat and two as backups. The Miss GEICO Victory is made of carbon, Kevlar and S-glass for high performance. The boat sports a pair of 1650 RACE Sterndrive engines producing 3,300 horsepower and top speeds of 200 mph"...
Colton said the team plans to develop another pair of engines - expected to produce additional horsepower while maintaining reliability - by November for the World Championships in Key West.

On the water, Miss GEICO is under the control of driver Marc Granet and throttleman Scott Begovich, who have been working together since the team was formed in 2004.

Miss GEICO's quest for a ninth world title begins May 13-15 at the 7th Annual Space Coast Super Boat Grand Prix in Cocoa Beach, FL.

New in 2016, the Miss GEICO team has added a P1 race boat to their fleet. The P1 is a "one design" boat that is 31-feet long and powered by a 250-horsepower Evinrude race engine. P1 races feature 10 identical boats, which emphasizes the operators' expertise over horsepower and boat design. Micah Paul known will drive the P1 Team GEICO craft while Craig Wilson operates the throttles.

The P1 schedule include races April 8-9 in Tavares, May 20-21 in Kissimmee, June 3-4 in Jacksonville, and July 1-3 in Sarasota. "The 2016 race season is expected to be our best ever," states Marketing Manager Gary Goodell. "We look forward to winning our ninth world championship title!".

Read more at PRNewswire.com
See also, Superboat race schedule at superboat.com
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FEATURE: "Why Does My Boat Porpoise?"

Questions from subscribers: *1) "My ModVP style sport tunnel with centerpod has a "hopping" motion at about 70 mph. It's like porpoising, but it goes away at about 80mph. What is wrong with my setup?"; OR 2) "I have a Checkmate 24 vee hull that porpoises at one speed and won't stop - why is this?*

Answer: Porpoising is common in many hull designs, and is a common trait of high-performance hulls - particularly tunnel hulls and pad-vee designed hulls. I call the transition speed the "hump zone" and it often marks the onset of porpoising.

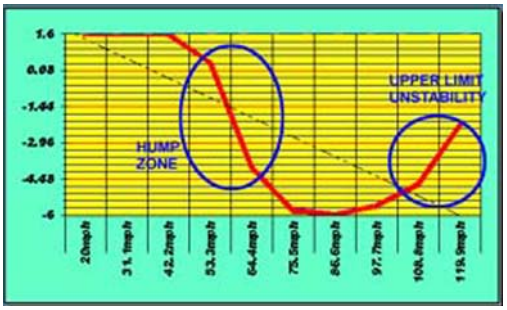
Any vee hull or tunnel hull can be susceptible to porpoising depending on design and setup. For example, *flatter bottom* vees or sponson surfaces are more prone to porpoising than steeper deadrise hulls. *Higher trim angles* are more likely to initiate porpoising than lower trim angles. There are several contributors to the occurrence and any hull can find the problem caused by dynamic instability.

The "bouncing" or porpoising is triggered by a rapid change in the location of the center of

Lift (CofL) as the boat accelerates. The relocation of static weights is one way of dampening the rate of change of the CofL...so it's not always obvious whether to move weight fore or aft in order to cause the "dampening". The solution can be calculated, but it's also not too difficult for you to test by moving weight fore or aft, to help your particular problem.

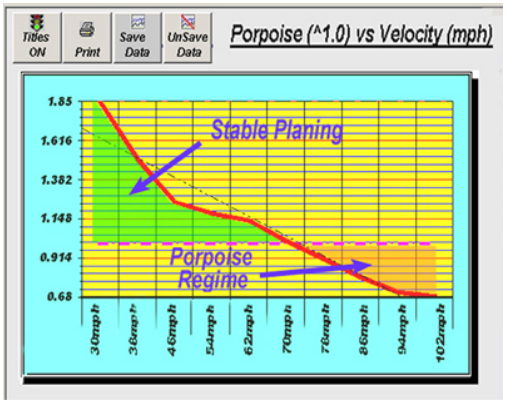
The resolution to a porpoising problem with a hull design is most always addressed by causing the boat to run with less trim. There are many different ways of achieving this....

What Causes the Onset of Porpoising? - A tunnel hull gains it's performance from a unique balance between aerodynamic lift generated by the aerofoil/tunnel configuration and the hydrodynamic lift generated by the running sponson surfaces. It's "hump" or "transition zone" represents the speed at which the amount of lift becomes predominantly aerodynamic (air lift from tunnel and aerofoil) compared to hydrodynamic (water lift from sponsons). On a pad-Vee hull, the "hump zone" is the speed at which the amount of lift changes from mostly the vee surfaces to mostly lift from the pad surfaces.



At the speed that the transition occurs, the hull will always experience some *longitudinal instability* - and often triggers the onset of porpoising (but not always in that form). The hull experiences a dynamic CofG shift through the "hump" zone. The transition velocity can be accurately determined for any given hull design and setup, and can even be altered by hull design, weight distribution, propeller selection and engine/hull setup. For example, engine height adjustment can help find the best setup to "smooth out" the transition. Sometimes unplanned 'hook' or 'rocker' in the hull's bottom surfaces can exaggerate the performance effects thru the "hump zone". Weight movement will also change the speed at which the "hump zone" occurs.

The best performance hull designs minimize the "hump zone" to one that is mild and occurs through a narrow velocity range. This balance can be optimized when designing the hull. Once boat is designed/built, the best solution is to setup so that the hump zone occurs at a velocity that the driver does not need/intend to spend time in...in other words, you are just "passing through". Setup, trim and weight balance can help this allot.



We have developed a new analysis tool in the TBDP©/VBDP© software that helps predict your hull's inherent instabilities leading to porpoising. The technique is a prediction of the critical porpoise trim angle (CPA) and shows the velocity at which your hull configuration will experience instability in Porpoise Regime and has a susceptibility to porpoising.

Porpoising onset occurs when the lift is generated at a sufficiently *high trim angle* or sufficiently *low deadrise* so as to cause a dynamically unstable loading on the lifting surfaces.

The boat's reaction as it goes through the hump zone (for a given design/setup) will always be the same, too. So driving/handling experience helps. The "effects" of the hump zone can be "softened" through design and setup changes, but will always be there. There are design and setup optimizations that can be made to make the "hump zone" as smooth as possible - even comfortable.

So, What Do I Do About It? - Porpoising is a function of the lift generated by your hull,

the deadrise of your running surfaces, and the trim angle that is needed to get that lift. The onset of porpoising is, in part, influenced by the weight balance in the boat. Altering the deadweights in your boat (fuel, payloads, etc) can affect the speed and trim angle that porpoising will initiate. If a boat is porpoising at a given speed and load, ***lowering the trim angle*** will reduce or eliminate the porpoising. There are several ways to get there, but the bottom line is to reduce the trim angle at the velocity of porpoising onset. (Higher deadrise hulls are less susceptible to porpoising.) Even if the hull design is operating in the "Porpoising Regime" through a full range of velocities, reducing trim in some way will improve or resolve the problem.

For your hull design and setup, the speed and trim angle at which you will see the onset of porpoising can be determined. Changing trim angle, changing motor height, changing propellers, moving weight forward, will all help to reduce porpoising at a given velocity. Changing design variables such as running surfaces design, deadrise, engine setback, etc. can help maintain the hull in stable planing regime, avoiding porpoise regime.

Propeller selection can often change the dynamic balance of the hull/setup. For example, a change to a prop that provides more aft-Lift can alter the dynamic balance of the hull, and similarly change the speed and range of the "hump zone" – often eliminating porpoising. Weight distribution changes can also have a positive effect on "where" the "hump zone" will occur, as can change in power application. Changing "trim" angle while driving through the "hump zone" even if less efficient, will also provide a better experience, and when well controlled, can "close up" the range of "hump zone" substantially – eliminating porpoising.

Trim tabs (or more extreme whale fins) will also improve a porpoising problem, but these will also affect overall performance of the hull. Adding transom wedges can often help too, since they will allow for more negative trim travel, if it's required. Raising the prop shaft higher will shift CofG forward and reduce trim angle. More HP also reduces trim angle. Reducing your trim angle in some way will always help a porpoising problem.

Read more on Porpoising in this article on "Hump Zone/Why does my Boat Porpoise?".

The complex engineering analysis of "porpoising" is addressed in more detail here: "Porpoise Regime Analysis"

See more Performance Articles at: www.aeromarineresearch.com

[Note: Do you have any of your own questions on performance hull design? Send your question or story to mailto:jimboat@aeromarineresearch.com?subject=TBPNews]

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Video - Tunnel Blow-over at 2016 24Hrs of Rouen

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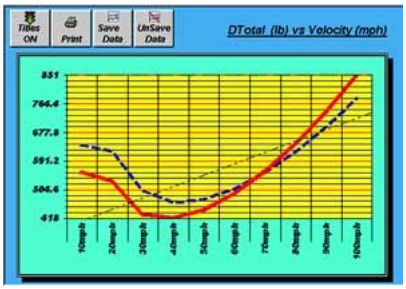
NEW TBDP/VBDP Ver 8.6 software release!

See the newest Version 8.6 "Tunnel Boat Design Program" and "Vee Boat Design Program" software.



"The best TBDP/VBDP release ever!" - Dozens of new features, enhanced results. Performance optimization, speed prediction, stability analysis, porpoising analysis, acceleration, elapsed time, and allot more!

See your hull's performance results throughout the full operating velocity range. Easy Auto 1-2-3 Performance Wizard. Now Vee hull and Tunnel hull design in same software package.

Version 8.6 has NEW screen layouts, NEW input variables, more performance analysis, output data/graphics, more reporting. Also includes the NEW 2016 Motor Wizard update with over 2050 OEM engine choices. NEW input variables and NEW 5-screen input format. Performance results with 500+ performance data points and 50+ trending graphs showing full velocity range. Animated 3D Chart display for Lift/Drag component contributions through Velocity range. And way more!!

See some of the new update features here, and all the high performance TBDP/VBDP features here.

See more at AeroMarine Research

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See 13th Edition "Secrets of Tunnel Boat Design" book (ISBN# 1-894933-30-3)
See ALL the TBDP/VBDP features, screen samples, and 'how-it-works'!

Review: TBDP V8 at Scream & Fly magazine. *["Tunnel Boat/Vee Boat Design Software is the very best and most comprehensive performance evaluation tool available. It has been evaluated by Scream And Fly, and has proven to be extremely accurate and easy to use. Version 8.4 is the most robust yet" - Scream and Fly mag, March 2015]*

Get the new TBDP/VBDP software! Buy Now

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Jimboat interviews F1 H20 star, Shaun Torrente
"How Trim Angle & engine height affect performance"
"Outboard Jack Plates'

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See you next time!

/Jimboat