Tunnel Boat Performance News - #174 - Apr 15, 2016

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Powerboat historian Fred Farley dies at 71

April 16, 2016 - Fred Farley, who dedicated his life to preserving the history of boat racing, died early Friday morning from complications after open heart surgery. He was 71.

Farley grew up in Seattle during the 1950s and quickly became a fan of the sport of Unlimited hydroplane racing, which at the time was just coming to the Pacific Northwest. A seven-year-old Farley watched the boats on TV and became hooked...

“I remember sitting in front of the TV and being mesmerized by those awesome machines,” Farley said in a 2005 interview. “To me, they were just the neatest things in the world. And they still are.”

In 1960 Farley struck up a friendship with Phil Jursek, a Detroit native and hydroplane historian, who sent Farley all of his records dating back to 1903. Three years later he began writing for the Seattle Seafair program book, using his vast knowledge to chronicle the sport. In 1973 Unlimited Racing Commission executive secretary Phil Cole approached Farley about becoming the sport’s official historian, a position he held until the time of his death.

While Farley grew up in Seattle, the Madison area eventually became his home. His first trip to the city was in 1971 when his parents bought him a bus ticket to the race as a graduation present from the University of Washington. As it turns out, the Miss Madison won the Gold Cup that season and it created a love affair with the team and the city that never abated.

“When I first caught sight of Madison my heart skipped a beat,” Farley said. “It was love at first sight. Even though I had never visited there before, it felt like home. “I always say I have a favorite race as a child and a favorite race as an adult,” Farley said. “As a kid, it would be the Gold Cups of the 1950s. As an adult, it was the 1971 Gold Cup at Madison. For

me, it was probably my all-time happiest moment."

During his career, Farley wrote more than 700 articles on boat racing and five books. "I got lucky," Farley said. "I don't regret it for a minute."

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Tim Seebold Partners with NGK Spark Plugs for Last Lap Tour

"I feel like I've accomplished more than I could ever dream of as far as a driver," said Seebold. "After a long career, you're always going to remember the last of it and how the end played out. My goal is to go out on top one more time this year to showcase what our team is capable of."

Partnering with NGK Spark Plugs as the title sponsor for a fourth straight season, 2016 will be the final year of a 77-year Seebold Racing lineage that spans three generations. "My grandfather, my father, my older brother Mike and I have spent our lives dedicated to this sport," said Seebold. "One of the things that made our family thrive was that we all did it together. We all were heavily involved and active in the sport and racing was a family affair. I'd like to leave racing in a better position than it was when we first got involved."....
Tim's grandfather, Bill Seebold, Sr., began racing in 1939. His father, Bill Seebold, Jr. enjoyed a 46-year racing career that included 69 world and national championships and more than 900 race victories. His sons, Mike and Tim, started racing at ages 13 and 8, respectively. Mike is a multi-time National and World champion in a variety of different powerboat classes and Tim has won 16 World Championships and boasts the most race wins in USF1 history, including his most recent title as the 2015 USF1 Powerboat Champion.

Team Seebold is going gold in 2016 for the Last Lap Tour, sporting a different look in conjunction with an important milestone for NGK Spark Plugs (U.S.A.), Inc. The partnership between NGK Spark Plugs and Seebold Racing began over fifteen years ago and the sponsorship has grown as Tim's career has succeeded.
Team Seebold is sponsored to compete in 11 races for the 2016 final season:

- Highlands, TX - 4/9-4/10/2016 - SPORT F1
- Port Neches, TX - 4/29-5/1/2016 - SPORT F1
- La Porte, IN - 6/3-6/5/2016 - USF1
- Nashville, TN - 6/18-6/19/2016 - HOT
- Bay City, MI - 6/25-6/26/2016 - USF1
- Quebec, Can. - 7/15-7/17/16 - USF1
- Pittsburgh, PA - 8/6-8/7/2016 - USF1
- Rising Sun, IN - 8/13-8/14/2016 - PN SST 200 North American Championship
- Detroit, MI - 8/27-8/28/2016 - HOT
- Shreveport, LA - 9/2-9/4/2016 - PN APBA OPC National Championships
- Orange, TX - 9/16-9/18/2016 - SPORT F1

"You can't do this on your own," said Seebold. "Without the knowledge and change in perspective from your family, your team and your sponsors, none of this is possible. This sport has always been fun. I've been fortunate to have the people I love support me and share this with me. When you're having fun, it never truly feels like hard work."

Tim has been working day and night for the past couple of months to get the 3 Formula One Racing Boats, 48 Foot Race Trailer and Semi Hauler re-branded with this year's new NGK 50th Anniversary Gold edition graphics. He has teamed up again with Kevin Pyles, owner of the MOTO Marketing Group, to help design the new look. Kevin, who has worked with the

Seebold Team's Marketing and Graphics for nearly 20 years feels this new boat design is the best they have ever created in Seebold's Racing History.
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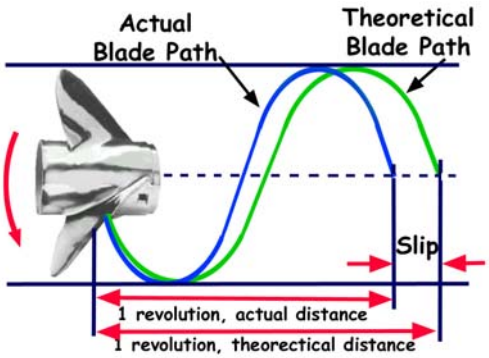
FEATURE: "Propeller Slip, Myths And Truths Explained"

Propeller slip, also known as prop slip, is a valuable guide that can really help us dial in powerboat performance. The expression is also one of the most often misunderstood of all propeller terms.



'Prop Slip' is not a measure of performance, but rather a calculation that helps compare the performance of different propeller setups on a hull. Slip is the difference between the propeller's actual distance travelled and the theoretical distance of travel.

Measuring slip is a good method for comparing two setups on same rig. While it can help identify a 'big-picture' issue, it's not always helpful as a 'stand-alone' measure of performance or efficiency.

Slip is a necessity for a propeller to work. if there is zero slip, then the propeller can't turn at all, generates no force and thus no MPH. So while "less slip" is generally more efficient than "more slip" when measuring 'power efficiency', it does not indicate that a boat will go faster just because of "less slip".....

Here's How It Works

Slip is the difference between the propeller's actual distance travelled and the theoretical

distance of travel (pitch) and is a result of the need for the propeller blade "angle of attack". If the propeller blade had zero angle of attack, there would be no slip; but there would also be no thrust - and so, no moving forward.

As an example, a boat propeller with 19" pitch may move forward a distance of 16" for one full revolution. The prop has only moved 16/19 = 84% of its theoretical maximum. Slip is then calculated as 16%.

Less is Better?

So, less slip is better than more slip, right? Well, sort of. We might think that any amount slip is a bad thing. Well, not really – slip is actually a necessity!

Another way to think of "prop slip", is to consider that when the propeller rotates it creates thrust and moves forward through the water. To move through the water, it must "slip". If there's no slip, there's no movement.

The aim of propeller design or selection is to achieve just the "right amount of slip". This means matching the right amount of blade diameter and blade area to the engine power and RPM. More diameter and/or blade area will generate less slip but can also result in lower engine RPM resulting in reduced overall performance.

Propeller Pitch

Prop slip is really just a calculation that compares real life performance to the "effective pitch" of your propeller.

Changing the pitch of your propeller can be the key to fine-tuning boat performance. Pitch is the theoretical distance the prop would travel through water during one complete revolution. It is similar to the distance a screw would travel in one revolution while

penetrating a piece of wood.

However, a 19-inch-pitch prop doesn't actually travel 19 inches in one revolution. This is because slippage occurs in the water. (We can't drag our boat through a piece of wood with much efficiency!)

By convention, props are identified by diameter and pitch: For example, 12" X 19". This means the prop has a 12-inch diameter and a 19-inch pitch. Typically, this information is stamped on the hub.

How To Calculate Prop Slip

We can't easily 'measure' the actual distance travelled by a propeller in a revolution. To properly determine prop slip, users must know several determining factors, including speed, RPM, drive ratio and propeller pitch.

The 'prop slip' of your boat setup can always be calculated using the same mathematical formula.

SLIP = 1 - [V * 1056] / [RPM * PP * GR]

Where;
V= Velocity (mph)
RPM = revolutions per minute of engine (rev/minute)
PP = Pitch of propeller (inches)
GR = Drive Gear Ratio (propeller shaft /engine drive)
SLIP = Propeller Slip (percent %)

Here's an example….
Let's say our boat/engine setup has these measurements at top speed:

- RPM = 6500 RPM (rev/minute)
- PP = 26 (inches)
- GR = 0.535 (1.87:1 gear ratio)
- V = 75 (mph)

Then…
SLIP = 1 - [75 * 1056] / [6500 * 26 * 0.535] = 0.124
So, propeller slip is 12.4%

What affects prop slip

There are many factors that affect prop slip including the actual "effective pitch" of the propeller, propeller diameter, the condition of the propeller, the design of the hull, the condition of the bottom of the craft, additional weight on the craft, distribution of weight, engine height, engine trim angle and setback, speed of the craft, and more.

Speed and hull type are two of the principal factors affecting prop slip. For instance, a barge traveling at 9 mph could have a prop slip of approximately 45%, while a tunnel boat or hydroplane traveling at 90+ mph might have a prop slip as low as 7%.

When testing 2 similar propellers we can use the calculated 'prop slip' to assess which is the 'better' fit for our hull setup. There are often aspects of a propeller design that are not immediately obvious (camber, cupping, blade shape, blade area, blade thickness, skew, rake, etc.) that can influence how it will perform on a particular hull setup - and in these cases the 'prop slip' can boil down these subtle differences into a helpful performance comparator. [see also "Anatomy of Propellers"]

Sometimes a propeller that performs with MORE slip on a particular hull setup, can actually achieve a higher velocity. For example if the hull can turn a higher pitch prop and still achieve satisfactory engine RPM's, it may show a greater slip %, but still achieve better top speed.

Be careful with the numbers

Sometimes when the slip computation is done, the numbers can be misleading. Remember,

it's only a mathematical calculation, so sometimes it's important to consider what the 'answer' really means.

For example, if the calculation tells us that we have "negative slip" (e.g.: SLIP = -2%) then something is wrong with our measurements. "Negative slip" is a mathematical impossibility. Similarly, a performance boat calculation that shows "35% slip" is also potentially suspect. More likely, very low or very high calculated slip turns out to be the result of a faulty RPM reading, faulty MPH measure, or an improper representation of the propeller pitch dimension. The rest is just math.

So it's important to consider the reality of the propeller slip calculation, checking all your measurements and gauges if something seems awry.

The Bottom Line
Prop Slip is a great way to assess if we've got a "big-picture" problem, and it's often very helpful when comparing the performance of two different propellers on the same boat and setup.. It's helpful to remember though, that 'prop slip' is just a useful calculation, it's not the final determination of any kind of performance evaluation

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[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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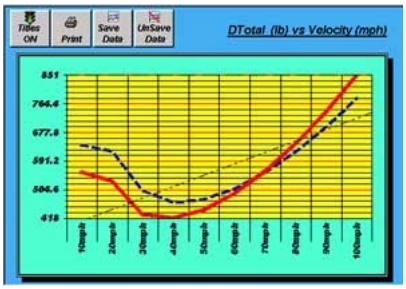
Video - The History of Tunnel Boat Racing

The History of Tunnel Boat Racing 1969 - 1994. [click for video] [back to top]

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. 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.

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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]*

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