

AeroMarine Research

TBPNews - Performance Report

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MIAMI 2016: Mercury Marine debuts new outboards



MIAMI — Mercury Marine introduced four market-specific outboards Wednesday night, ranging from 40 to 400 hp, and presented a number of integrated electronic accessories to make boat operation easier.

On the eve of the 2016 Miami International Boat Show, Mercury unveiled a 115-hp 4-stroke aimed at the inshore saltwater and freshwater bass boat markets. The 115 Pro XS FourStroke joins the Pro XS lineup of 2-stroke direct-fuel-injected (DFI) outboards.

In 2015 Mercury debuted the Verado 400R outboard. On Wednesday night it unveiled a variant of the outboard specifically meant for offshore racing — the Mercury Racing 400 ROS (Race Offshore). Developed by the Mercury Racing division, the 400 ROS will replace the existing fleet of Mercury Racing two-stroke

2.5L EFI race outboards....

"We are seeing continuous growth of 4-stroke power globally," Mercury Marine president John Pfeifer told about 33 journalists (nine from outside the United States) at the engine maker's product introduction at the DoubleTree Hotel in downtown Miami.

"The 4-stroke is certainly coming in and taking over the 2-stroke, even in the DFI [direct fuel injection] segment. Every year that goes by, DFI goes down and 4-stroke goes up — and disproportionately so."

The new engine should be particularly popular with freshwater and saltwater tournament anglers and guides. The 115 Pro XS FourStroke is based on Mercury's current 115-hp 4-stroke — an inline four-cylinder engine — that debuted in 2014. Mercury has given the engine more power and torque, enabling it to crank up to 6,300 rpm.

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For military and government uses, Mercury Racing also debuted its 175-hp DSI (Diesel Spark Ignition) outboard. The engine features Mercury Racing's spark ignition, direct-fuel-injected 2-stroke technology, which enables it to run on ultra-low-sulfur diesel fuel, said Foulkes.

The 3-liter diesel shares 95 percent of its components with the gasoline 2-stroke Mercury outboard from which it is derived, said Foulkes. The similarity allows the engine to be serviced by most Mercury dealers, said Foulkes. In addition to military, government and patrol applications, the new DSI is ideal for boats used as tenders to a mother ship with diesel power, he added.

Mercury, at the in-water portion of the show, is displaying 14 boats ranging from 19 to 50 feet, powered with its outboards and gasoline sterndrives. The 115 Pro XS FourStroke powers a Mako 19 Pro Skiff.

Mercury introduced its next-generation Joystick Piloting System for Verado outboards, Axis gas and diesel sterndrives and Zeus pod drives. The new joystick includes an indicator on the joystick for route, heading and Skyhook (station-holding) modes; it also now has enhanced reverse thrust for Verado applications.

For propellers, Mercury introduced two new wheels for outboards from 75 to 115 hp — the SpitFire X7 and SpitFire CT. The latter is built with Mercury's Command Thrust lower unit, a more robust drive with four blades ideal for the holding power needed for pontoons. The X7 is made with Mercury's new alloy and is built for maximum top speed and acceleration.

Mercury redesigned its side mount mechanical control with improved shifting and better ergonomics. The control works with outboards from 25 to 300 hp.

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7 venues lined up for 2016 XCAT calendar



Fresh, new venues and exciting locations are on the cards for this year's UIM XCAT World Powerboat Series with the 2016 calendar announced today. The stunning glacial Lake Lugano will play host to one of the seven rounds in the season ahead while XCAT action will also visit two Asian venues in the coming year.

The XCAT World Series truly is a spectacle of speed, with teams of two taking each other on in two-engined carbon-fibre boats that tear around the course at speeds close to 200km per hour.

Last year saw XCAT racing visiting both Portugal and Australia for the first time, with the Gold Coast event in August attracting a record number of television viewers in over 750 million households. Hot on the heels of last year's success, the 2016 XCAT season will kick off in the Gulf of Oman in the UAE city of Fujairah from 7-8 April before heading cross-country to Dubai for Round 2 the following weekend, from 15-16 April.

The festival of speed then heads to the breathtaking background of Switzerland for Round 3 in Lugano from 4-5 June before heading to Asia in September and October. Details of the Asian venues will be announced at a later date but the races are scheduled for 24-25 September and 8-9 October...

The UAE capital, Abu Dhabi, will then welcome back to competing teams as they tackle the penultimate round of the Series from 17-18 November with the grand finale scheduled for Dubai from 2-3 December. "It is with great excitement and anticipation that we are announcing the XCAT calendar for 2016. What a fabulous year we have to look forward to," HE Dr Saif Al Ketbi, President of the WPPA – organisers and promoters of the Series.

"With several new host cities – and countries – to visit it promises to be a truly extraordinary season. We look forward to welcoming all XCAT fans to enjoy the racing at these venues or to catch every minute of the amazing action live on TV as millions across the world are caught up in the excitement," added Al Ketbi.

2016 XCAT Calendar

Event	Date	Venue
Fujairah GP	06-08 April	Fujairah, UAE 
Dubai GP	14-16 April	Dubai, UAE 
Lugano GP	03-05 June	Switzerland 
TBA*	23-25 September	Asian Continent
TBA*	07-09 October	Asian Continent
Abu Dhabi GP	16-18 November	Abu Dhabi, UAE 
Dubai GP	01-03 December	Dubai, UAE 

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Why do Boats Create Rooster Tails?

FAQ: This question comes to us from one of our readers (DS)- "Why do boats create rooster tails"?

Response: I've had many people ask me about the "lost energy" in a performance boat's roostertail. You are all right - there is a lot of energy to pump that much water into the air.



Definition: "Rooster-tail - A projected mass of fine particles of water, having an arced shape similar to that of a rooster's tail."

The rooster tail is the result of propeller hydrodynamics - the displacement of water used to generate the thrust to propel the boat forward at great speed. Present day engines can have huge power capability, and it's a challenge to transport this energy as thrust for forward motion of the boat. For example, the 200+ hp or so of engine power is converted through an outdrive to thrust of about 1300 pounds (or more) at 60 mph. That load is pushing against the water. Some of the water just can't stay where it belongs, especially if the angle of the trim is trying to push the bow of the boat up - and hence the water at the rear up too! So this is why thrust is more efficient when the motor drive is trimmed "in", with a "thrust-line" angling down into the water....

Surfacing propellers also contribute to "rooster-tails". The surface piercing propellers run half in and half out of the water and usually display a rooster tail into the air behind the boat. While these surface-piercing props experience much less drag and are much less susceptible to cavitation, they also expel a certain amount of water "normal" to (straight up from) the water surface. Since this happens as the prop also generates forward thrust at the expense of the static water, the result is a "flow" of water up and back from the propeller.



Propeller shaft depth and thrust (trim) angle can affect the efficiency of your propeller thrust, and is often illustrated in how much of a rooster tail you see. Propeller design features also have an affect on thrust efficiency and thus, on the view of the rooster tail. Generally, however, the more "rooster tail" we see, the more inefficient is the thrust.

For example, propellers designed to generate bow lift (eg: high rake) can operate to direct the "thrust cone" of your propeller to be more "narrow" or more focused. Propellers designed to be "stern lifting" can result in a "thrust cone" to be more expanded or "fat", expending energy that is not aligned with the direction of the prop shaft, and shows a more dramatic rooster tail as a result. These types of setups can have the benefit of lifting the rear of the hull and reducing overall hull drag - so the tradeoff (less efficient propeller thrust) can be worth it! Props that have very narrow thrust cones will push more of the water directly in line with the prop shaft - more efficient thrust - very little energy is thus wasted and only a small rooster tail will be visible.

Larger diameter and/or smaller pitch props can usually generate lower rooster tails - but this won't always mean better performance. It is most always, like everything in performance powerboating, a trade-off or

compromise.

When you see a boat that is well rigged, well set up and well driven, the rooster tail can give it away! Often the tell-tale of great setup is NO ROOSTER TAIL! - the "spray" of rooster tail shows very little loss of energy through the lower unit and propeller setup. The hull setup is perfect for the speed he is going, and the engine trim angle is perfect to maintain hull stability and minimize power lost through generation of rooster tail. It is a picture of beauty to see a boat set up as perfectly as to see the 'perfect rooster tail'.

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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%20article%20suggestion&body=I've%20got%20a%20suggestion%20for%20an%20article%20in%20your%20TBPNews%20newsletter!>]

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Video - World Outboard Championship - Lake Havasu 1979

Lake Havasu High School students video taped and produced a 30 min production as a class project in 1979. Howie DiBlasi was the Vocational Education Instructor that used the race as a real world project for the students to learn on. Today it is called Project Based Learning (PBL). Back in the day Howie DiBlasi and his student were 21 years ahead of the curve in providing Vocational training for his students.

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NEW TBDP/VBDP Ver 8.5 software!



See the new Version 8.5 "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. Now Vee hull and Tunnel hull design in same software package.

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