

SUPER DRIVE SYSTEM!

Locally developed Axis Drive *ROCKS* the market

When Caudwell Marine unveiled their new radical drive system in 2009, it was met with a few oohs and aahs, and perhaps a certain level of disbelief and suspicion. However, like it or not, the radical new Axis Drive System is set to change the way the industry views engine and gearbox configurations.

Words by Anton Pretorius
Pictures courtesy of Caudwell Marine



Leisure Boating caught up with esteemed engineer and brainchild of the Axis Drive System, Mike Beachy Head.

Proudly South African

If you attended the 2009 Cape Town International Boat Show, you might have noticed the launch of a totally new revolutionary drive system in the form of the Caudwell Axis Drive. The new Axis Drive had generated quite a following in the recreational market. It's been mentioned in marine journals and displayed at various boat shows throughout Britain (and the rest of the world) over the past two years.

The Axis Drive is the brainchild of South African engineer Mike Beachy Head of Thunder City fame (think beautifully restored old fighter jets) and British billionaire John Caudwell. They realised that there was a need for a new viable propulsion system for small to medium size craft, hence the birth of the Caudwell Marine Axis Drive.



Now, Caudwell Marine has broken into the F1 Powerboating scene with the recent launch of their Axis-Drive F1 engine, demonstrated in a DAC-designed two-seater F1 boat. Recent testing showed that even though the boat weighs 150 kg more than the actual F1 mono-seat racing hulls, it easily matched top end F1 performance levels, reaching an impressive 232 km/h (an unofficial SA water speed record).

But like everything else, F1 Powerboating had to succumb to the "green revolution" as their traditionally mega-powerful 2-Stroke motors have a severe impact on the environment. Fortunately, the solution lies right here in South Africa.

Caudwell Marine's Cape Town-based High Performance development group has come up with an eco-friendly, cost-efficient, responsive 4-Stroke motor. The F1 Axis Drive engine, an extremely modified derivative of the leisure-orientated 4-Stroke motor boasts a long list of positive attributes like dramatically improved reliability, a third less fuel consumption at full throttle and only 5% of a typical 2-Stroke's exhaust emissions, to name but a few.

The Mechanics of it



In conjunction with Nissan, the Axis Drive is available in three versions: 350 and 501 supercharged petrol and 300 turbocharged diesel engines. The Caudwell Axis Drive is a power train without a universal joint. Constructed mainly from stainless steel, the Axis Drive steering is achieved by the rotation of the whole gearbox and drive leg around the same axis as the engine crankshaft.

This innovative design successfully eliminates the need for a universal joint and separates the connection between the yaw axis for steering, and the pitch axis for tilting. For Mike Beachy Head and John Caudwell, it's been a consuming affair as it took nearly five years and US\$ 40 million to bring his imaginative idea to market. Although it's a difficult market to break into, the competitors have been caught on the hop as they never saw it coming. "Well, it came from Africa," said Beachy Head with a good deal of pride, pride for himself, his team and his country. Here's what he had to say:



Seen here in the picture is Nicolò di San Germano (President of IMSA F1 H2O) on the left, and Mike Beachy Head (CEO of Caudwell Marine and Axis Drive inventor) on the right.

Please briefly explain how the idea for the new Axis Drive came about.

Mike: The Axis Drive concept was born out of personal frustration with existing technology and then identifying a market need for a step change in recreational boating propulsion systems, which haven't seen significant technological advancement in decades.

Did your partner see the potential right the cuff?

Mike: I met John Caudwell during a visit to South Africa and shared the Axis Drive concept with him. As an engineer and avid boating enthusiast himself, John was impressed with the quality of the unique engineering and being an entrepreneur at heart, was most interested.

During subsequent visits to South Africa, he saw the progress made in concept and engineering design and eventually agreed to invest in Caudwell Marine in 2007.

The whole idea started as a sketch on a cigarette box. Did you think then that it would rise to such lucrative proportions?

Mike: We always knew the original concept was sound and that we were onto something special, hence the decision to go for patent protection sooner than later.

A number of iterations followed as we worked with our engine and gear partners to get us to the point we are at today. The very positive response we have received from the market proves the need for a step change in propulsion technology.



You opted for stainless steel construction as opposed to the conventional aluminium. What are the advantages of using stainless steel?

Mike: Surgical grade 316 L stainless steel is well known for its corrosion resistance properties in the marine environment, and it removes the need for sacrificial anodes. The highly polished surface reduces marine growth with the inherent structural strength and rigidity enhancing hydrodynamic performance.



Your objective was to combine the best features of stern drive and outboards in a single design. Example?

Mike: An example would be improving on the good power to weight ratios of the outboard with the latest automotive technology and combining that with the aesthetic appeal of the internal installation.

The reduced centre of gravity offers the most compact system available providing a more stable package without the space invasive outboards on the back of the boat.

Simultaneously the Axis Drive offers the first single step installation (engine, gearbox and drive combined) within 30 minutes — which is a massive benefit for OEM's who typically spend hours installing stern drives.

What were some of the problems you experienced with existing engines that prompted you to develop the Axis Drive?

Mike: Stern drive technology has heavy, dated engine technology, which takes up a lot of space, a universal joint prone to noise and reliability issues, and poor corrosion performance. Recent outboard systems have become huge, creating an unsightly overhang on the transom with a high centre of gravity, which reduces stability.

The new Axis Drive has a very modern design. How important is image to Caudwell Marine?

Mike: Our goal is to improve the consumer's experience considerably. This includes elements such as power efficiency, noise vibration, harshness, safe handling, space saving and reduced corrosion.

Aesthetics and the way the engine forms a key element of the style of the boat, we believe is part of that consumer experience and has been incorporated into the design. So yes, image is very important.

What segment of the boating market is the Axis Drive focused on?

Mike: We're focusing on the recreational sector from the 16 to 40 ft boats across the range of boat products that include RIBs, runabouts, bow riders, centre console salt water fishing boats and small cruisers.



Is the Axis Drive easy to maintain?

Mike: Ease of maintenance has been a major consideration. Oil change points are easily accessible on and off the water. All access points for engine coolant, hydraulic fluids and oil fill are on the front of the engine and easily accessible. We have succeeded in appointing a capable distributor and service network which will be supported by our on board diagnostics package.

Why did you decide to go with Nissan as the engine manufacturer?

Mike: After extensive testing of several automotive engines, Nissan was the engine supplier that satisfied all our requirements in terms of performance, quality, durability of technology, terms and conditions of supply and access to future product development.



Do you feel proud that the revolutionary Caudwell Axis Drive is South African produced?

Mike: Certainly, it is a source of great pride that we have been able to go to market with a product that has captured the attention (and imagination) of leading boat builders around the world.

