



CAUDWELL
MARINE™



INTRODUCING THE ALL NEW AXIS DRIVE™



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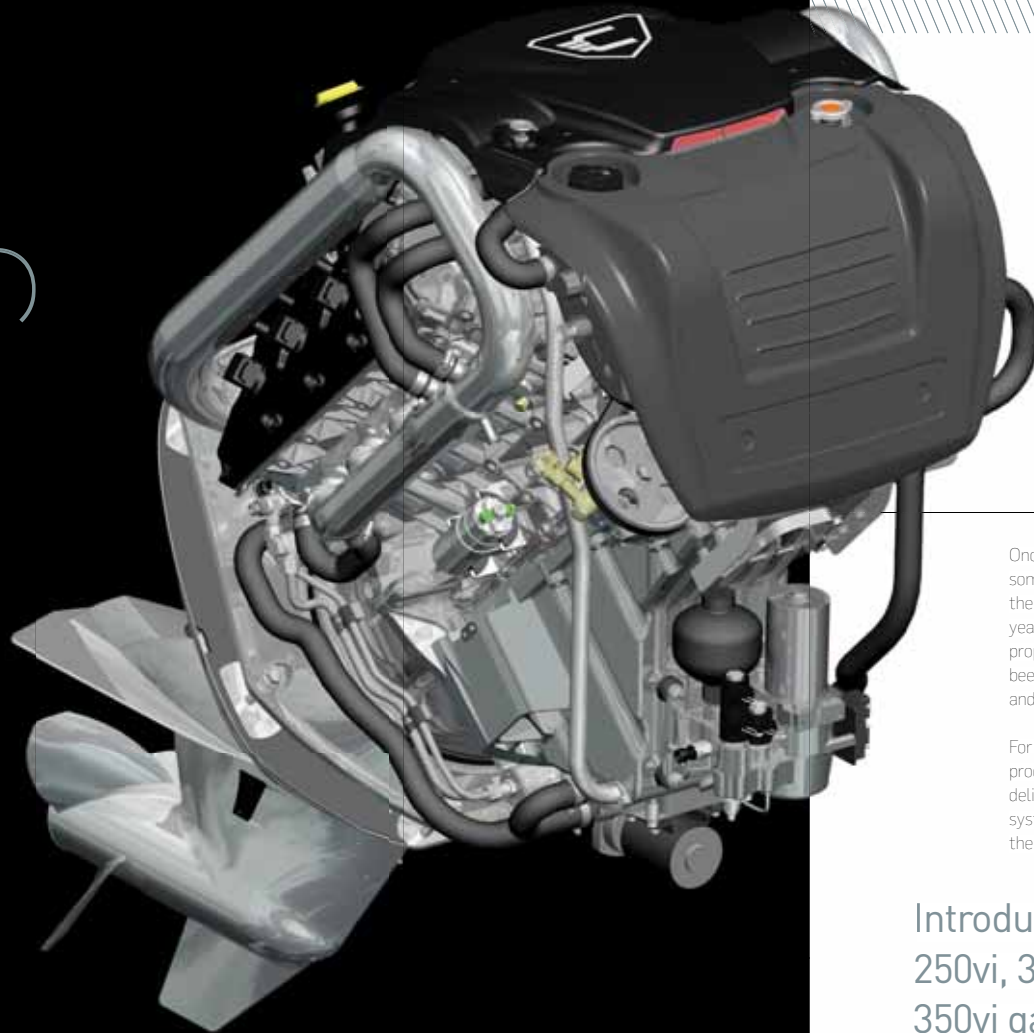
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CALDWELL
MARINE

DRIVE THE FUTURE™

introducing



Introducing the Axis Drive™

A Revolution in Recreational Marine Propulsion

Once in every few decades something new challenges the way we think. For many years recreational marine propulsion systems have been dominated by outboards and stern drives.

For the first time a new product is available that delivers the benefits of both systems while having none of their inherent disadvantages.

After a seven year development program, Caudwell Marine's™ engineering group, which includes big names such as XTRAC gears, Cosworth Racing, ILMOR, MBE Systems and NISSAN, has set new standards in overall

efficiency. This results in improved performance, reliability, durability, power to weight, safe handling, corrosion protection, internal boat space, noise, operator friendliness, aesthetics and a host of benefits over current product offerings.

Introducing
250vi, 300vi and
350vi gasoline
Axis Drives™ by
Caudwell Marine™



Axis Drive™

TO REDEFINE MARINE PROPULSION, CAUDWELL MARINE'S™ ENGINEERING TEAM HAD TO THINK OUTSIDE THE NORM.



Stern or Z drive disadvantages of excessive weight, universal or "U" joint noise and reliability, corrosion, handling and invasive size had to be challenged.

Outboards, with the recent increases in size and weight, engine articulation, open water cooling, top heaviness and cost had to be challenged.

A clean sheet approach was adopted and literally hundreds of new innovations were included.

The patented drive mounting method was designed to go *through* the transom and install as a single unit with the transom modified to a 45 degree angle - a move away from the traditional 13 degree dead-rise found on most boats. This had the effect of improving compactness, internal boat space and steering axis.

The patented mid section gearbox enables the drive to move in yaw (steering) much like a pod drive and in pitch (trim and tilt) without a

"U" joint and without engine articulation.

An electro-hydraulic cone clutch does the smooth and effortless shifting.

This multiple stage reduction gearbox (max 2,683 to min 1,876) was specified for a 1000 hour extreme E5 duty cycle.



Designed and manufactured by XTRAC, the world's leading race car gearbox manufacturer, the gear system was designed to reduce power losses and gear noise and includes a dry sump arrangement.

The drive was constructed out of stainless steel castings and claddings, polished to a mirror-like finish and subjected to extreme salt spray, abrasion and structural testing.

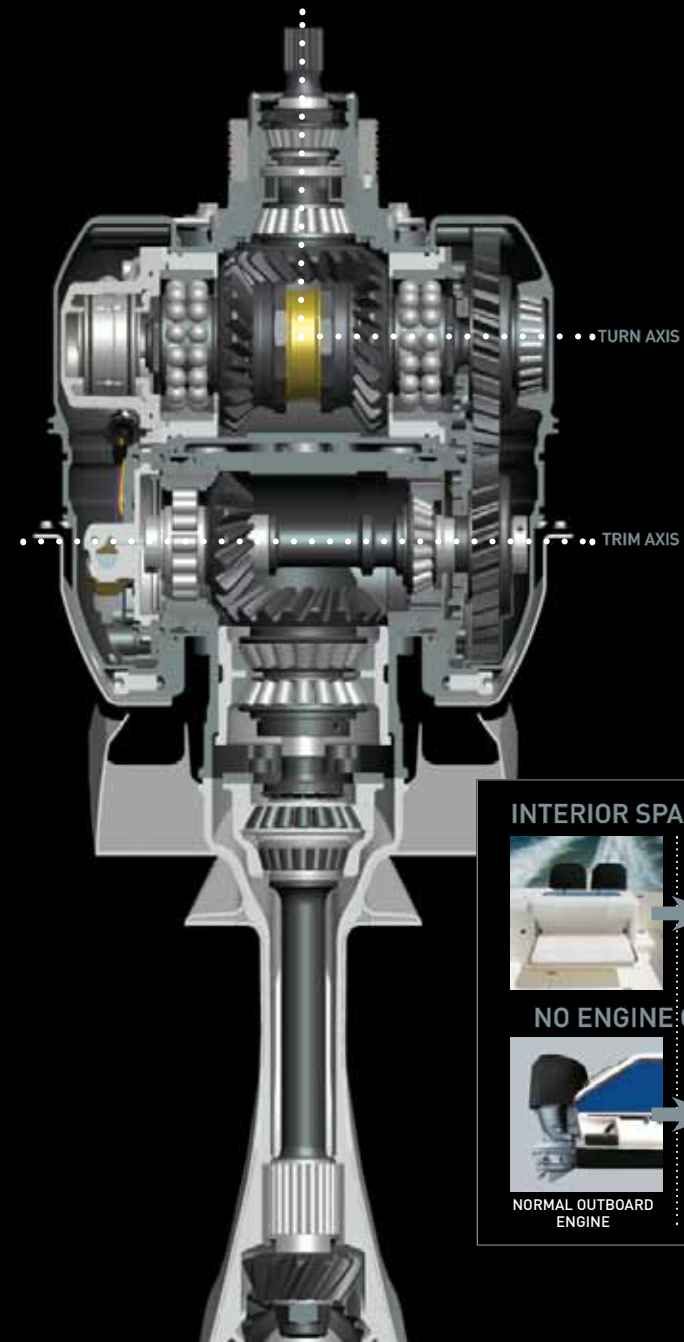
The standard hydraulic power steering is effortless and boasts a class-leading 32 degrees deflection either side.

The natural design geometry introduces a trim down component during turns, improving handling, torque neutrality and safety.

Dual speed hydraulics for trim and tilt/trailer are cleverly integrated, rendering unsightly rams and hoses invisible.

The hydro-dynamically optimized low profile raked leading edge and minimal torpedo diameter reduces drag and improves resistance to foreign object strike.

ALL CAUDWELL MARINE™ AXIS DRIVES™ ARE AVAILABLE IN COUNTER ROTATION.



INTERIOR SPACE THE SAME

NO ENGINE OVERHANG

NORMAL OUTBOARD ENGINE **CAUDWELL MARINE ENGINE**

the engine advantage

THE MOTIVE POWER

Caudwell Marine's™ state-of-the-art four stroke V6 and V8 engines are the latest in high performance, fuel efficient, low emission technology, meeting Euro four and EPA 2008 standards.

The Infiniti-based engine range includes the 250hp 3.5 liter V6, 300hp 3.5 liter V6 and the 350 hp 4.5 liter V8.

All engines combine variable valve timing with lightweight alloy blocks and cylinder heads to provide class-leading power to weight, bottom end hole shot and top end performance.

All the engines have integral closed cooling systems as standard using our dual electric on-demand cooling system: no salt water ever goes inside the engines, improving corrosion resistance and minimizing engine flushing after use.

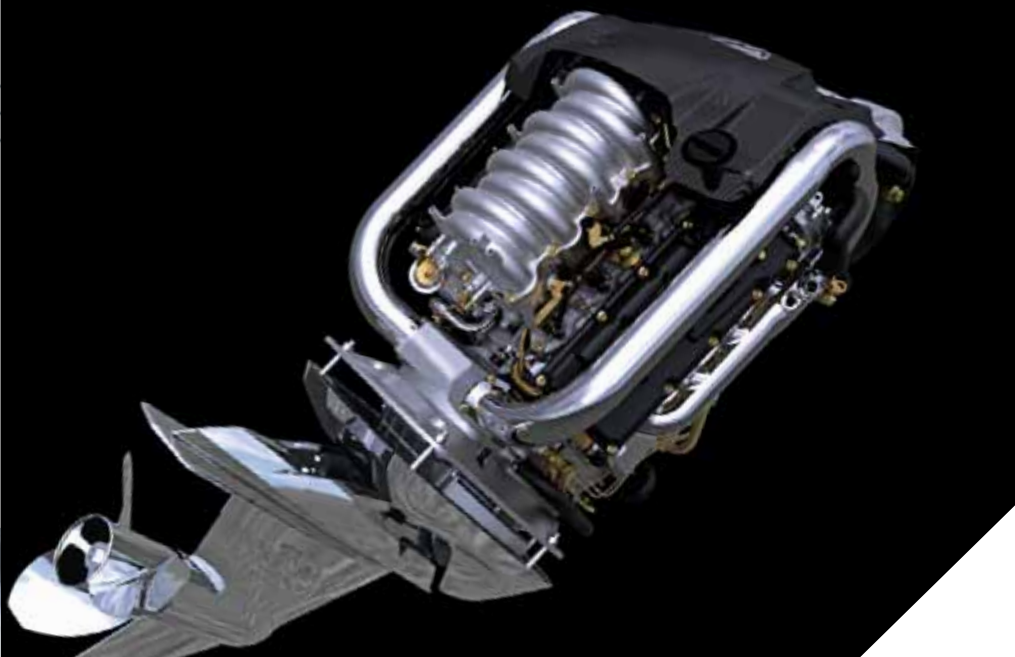
The stainless steel exhaust risers are corrosion-proof and allow for various riser heights. The high torque starter motor is mounted clear of the bilges for trouble free starting. Class-leading alternator power is standard on all drives and



the entire unit is completely coated in our specially-developed anti-moisture surface treatment.

Testing and validation of the propulsion systems comprised the most onerous durability and reliability program, operating in extreme heat, cold and the most hostile conditions imaginable – and came out on top.

OUR BADGE OF QUALITY: Engines running at full throttle were subjected to months of back-breaking "G" forces and the equivalent of ten years in an incredibly hostile corrosion environment – as well as endless stop start full throttle "hole shots". Extremes so radical they could never be emulated in normal operating situations. The net result is a range of drives unsurpassed in performance, durability, reliability, efficiency and features.



CONTROLLING THE POWER

Having all the power available is no good if it cannot be controlled.

Introducing Caudwell Marine's™ unique Vertical Intelligence™ architecture.

Caudwell Marine's™ unique approach to managing the power and functionality of the drive combines human factors with electronic and mechanical interfacing, resulting in an intelligent system that is thinking constantly about how to improve overall efficiency, safety and performance.

The DCU (Drive Control Unit) is the brain behind Vertical Intelligence™. The DCU drives the digital

throttle; closed loop emissions system; variable valves and intakes; electro-hydraulic shift; start-in-gear and gear engage protection; on-board diagnostics; and operator inputs and information - via our NMEA 2000 © compatible HCU (Helm Control Unit).

Sending operator intelligence to the DCU has never been easier. Our custom-designed stainless steel multifunction binnacles have beauty, brains and brawn – all in one.

Binnacles are available in single side mount, single top mount and dual top mount. (See specifications on page 15 for binnacle functionality.)

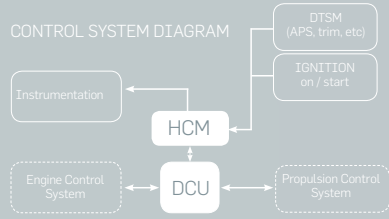
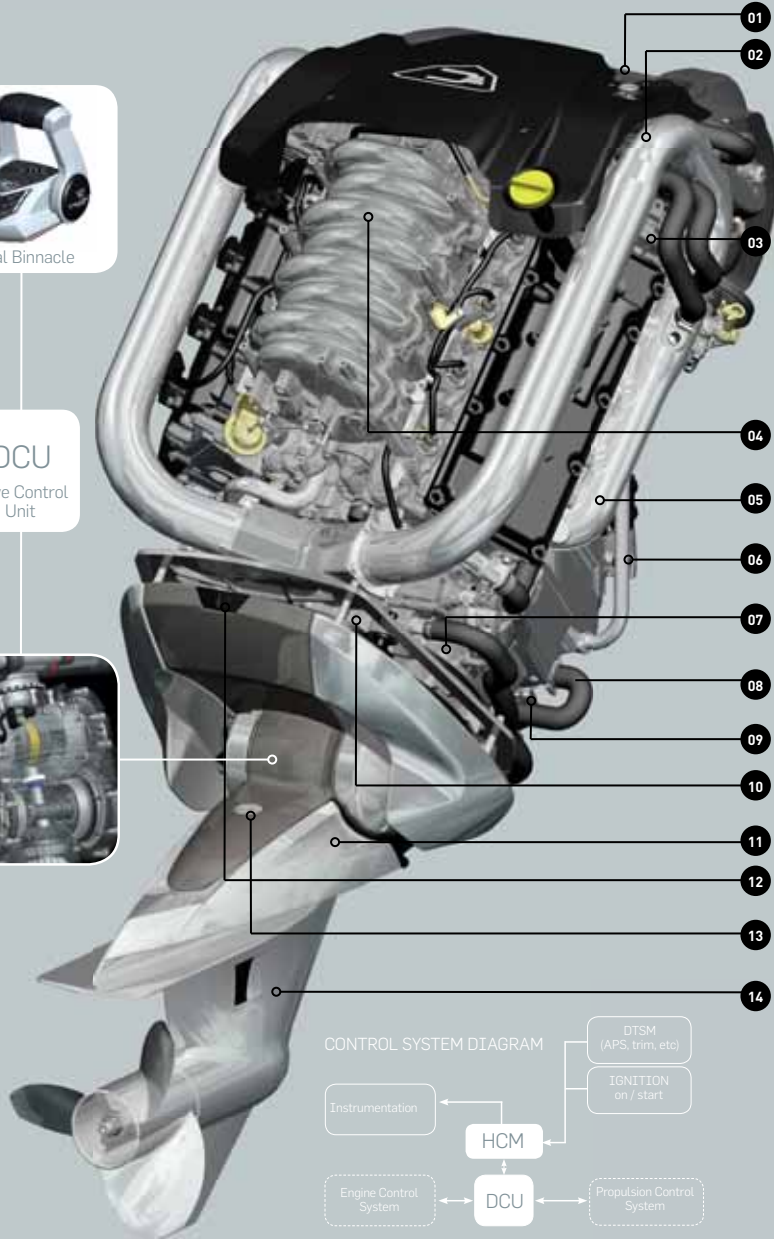


CAUDWELL MARINE™
DUAL BINNACLE



Dual Binnacle

DCU
Drive Control Unit



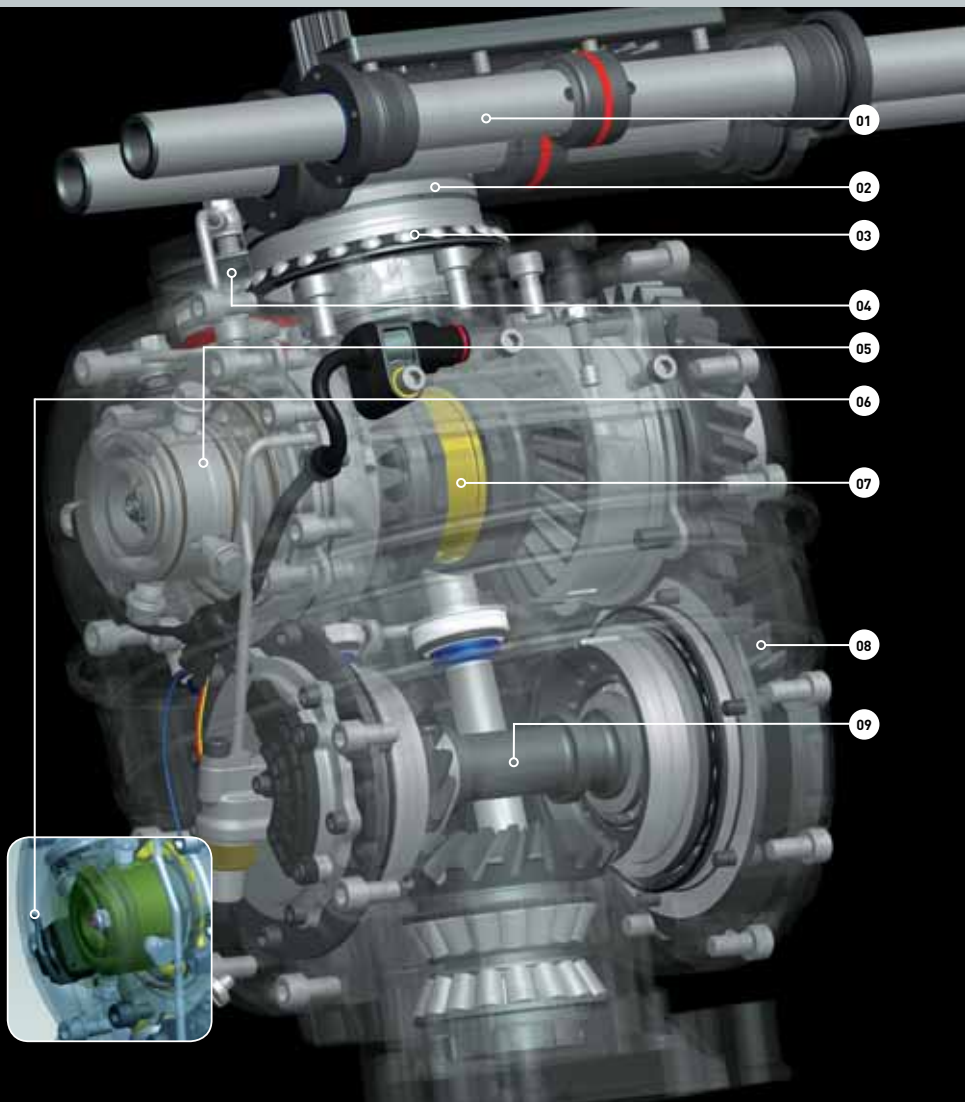
vertical intelligence™

VERTICAL INTELLIGENCE™ ARCHITECTURE

PURE PRINCIPLES – SEAMLESS INTEGRATION.

FROM THE HELM TO THE DRIVE, VERTICAL INTELLIGENCE™ IS LIKE HUMAN DNA – A STRING AS UNIQUE TO EVERYONE AS IT IS UNIQUE TO CAUDWELL MARINE™.

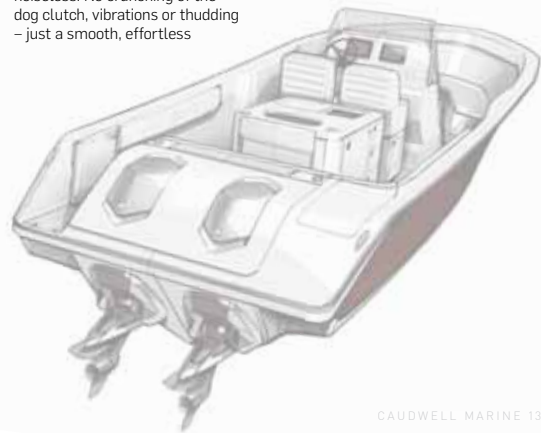
- 01 Intelligent Closed Cooling System**
A standard closed cooling system that thinks for you. Regardless of ambient water temperatures, the closed cooling system will send just the right amount of water through the heat exchanger, ensuring optimal and safe cooling at all times. The system integrates engine oil cooling, hydraulic fluid cooling as well as closed engine cooling and has operator warning and throttle reduction safety overrides should foreign objects enter the raw water system.
- 02 Intelligent Emissions and Power Control**
The Drive Control Unit (DCU) system uses closed loop LAMBDA sensing to set the injectors, valves and throttle positions for optimal emissions and power.
- 03 Variable Valve Timing**
The DCU will sense what the operator desires: rapid acceleration, optimal fuel-efficient cruise or a flat-out blast - and will adjust the cam train to the optimal position.
- 04 Variable Intake System (V8 only)**
For rapid hole shot and optimal top end performance, the variable intake system will set itself intelligently in the right position for the best possible performance.
- 05 Jacketed Stainless Exhausts**
Intelligently-designed stainless steel jacketed exhausts are split between engine coolant and raw water dump to ensure optimal engine operating temperature range and back pressure.
- 06 Engine Oil System**
The design architecture allows for ease of maintenance through a standard external engine oil drain located outside the boat; a wide mouth oil fill pipe to allow oil suction if changing the oil while the boat is moored; and a no-mess easy-change position for the oil filter.
- 07 Intelligent Integrated Steering**
Hydraulic assist power steering is standard on all drives and offers a very advanced thinking module that applies just the right amount of assist to give optimal operator "feel" and accuracy. A drive position sensor is standard on all models.
- 08 Intelligent Integrated Trim and Tilt**
The trim and tilt pump and the hydraulic gear selector are integrated in the same system. An accumulator assesses how much pressure is required for 12 F N R shifts and will top itself up on demand.
- 09 On-demand Water System**
The PWM-driven (Pulse Width Modulation) dual redundancy electric raw water system is driven by the DCU and will always supply exactly the right coolant for all the heat exchanger functions.
- 10 Floating Vibration Damping**
The entire drive architecture is suspended on a unique rubber insulation bed allowing incredible vibration-free smoothness and resistance to catastrophic impact damage.
- 11 Axis of Excellence**
No trimmable drive on the face of the planet gets its power to the propeller like Caudwell Marine's™ Axis Drive™. The drive turns around the engine crank plane's axis and it trims around the reduction gear axis. For vibration-free power, there is no substitute.
- 12 External Trim and Tilt**
Our VI architecture includes external trim and tilt as standard.
- 13 External Gear Oil Fill and Dipstick**
Yesterday's designs still use plugs and pumps to fill the gearbox. Not so with Caudwell Marine's™ unique dip-and-fill system. As it is a dry sump system it requires minimal oil (only 1.5 liters) and checking and filling is as simple as can be. The gear oil drain is through the exhaust diffuser.
- 14 Stainless Steel Construction**
Caudwell Marine™ has pioneered the use of duplex stainless steel thin wall castings as the ultimate in corrosion protection, structural strength and rigidity. The unique stainless 316L cladding system makes this the world's first completely stainless steel drive. No ugly sacrificial anodes are required and no drive has endured such severe corrosion tests.



intelligent drive-train

A REVOLUTION IN POWER-TRAIN DESIGN

- 01 Steering Axis**
Driven by the dual-acting rack and pinion power assist system, the entire gear-train revolves around the engine crank plane axis of input. Clever design renders the drive, completely torque neutral.
- 02 Walking Joint**
Normally only found in aviation due to the high engineering tolerances, all hydraulics for trim and tilt and gearshift operation are routed through a walking joint, eliminating the need for hydraulic braided pipes and hoses.
- 03 Integral Dry Sump Oil Pump**
The intelligent design of the oil pump puts the oil where it is needed most: at the gears and the bearings. This means the gears run free and do not have to churn up oil and give away valuable horse-power.
- 04 Integrated Trim and Tilt**
All trim and tilt functions are fed via the trim pack and walking joint. No hydraulic rams or hoses are exposed to the environment. This dual-rate system has an automatic over-lock for trailing; a pop-off release valve for a prop strike; and shear pin for catastrophic impact.
- 05 Hydraulic Actuation**
The hydraulic actuator activates the soft engage cone clutch and has been tested for literally millions of shifts.
- 06 Actuator Sensing**
The actuator sensor is an intelligent system that has a number of features. It offers start-in-gear protection, done where it should be – at the clutch and not the binnacle. It will advise the DCU when a shift is in process and drop the engine idle momentarily, as well as confirming to the DCU that a shift is fully engaged before allowing the engine to resume its target RPM or accelerate. And it does all this in 0.2 of a second.
- 07 Soft Engage High Torque Cone Clutch**
Using a unique spiral spline engage-and-release mechanism, the engage and disengage process is finger-light and noiseless. No crunching of the dog clutch, vibrations or thudding – just a smooth, effortless transition and huge torque capability.
- 08 Spiral Bevels and Offset Helical Gear Reduction**
All Caudwell Marine™ gears are hard-cut racing specification gears. These are not lapped or shot peened, but are true Le Mans endurance-specification gears, designed to run at optimal speed with minimal wear. Reduction, from 2.683 to 1.876, is done with helical gears, cross-cut to reduce gear noise.
- 09 Trim Axis**
After reduction has happened - and we need to do this to maximize prop speed and efficiency - power is transmitted through a cross shaft, around which, magically, the trim axis also happens. So with no engine movement and no universal joint, all the power goes where it should: to the propeller.



excellence is everything



DRIVE CONTROL UNIT, HELM CONTROL UNIT - AND YOU, THE OPERATOR

Caudwell Marine's™ unique VI architecture has the Drive Control Unit (DCU) at its heart. Most manufacturers talk about an EMS (Engine Management System) or microcomputers. Old news!

The Caudwell Marine™ DCU controls not only the engine processes of digital throttle; variable cam or valve timing; closed loop emissions; ignition; injector volume and timing; variable intake timing; as well as all the cautionary processes. It also controls gear shift; start-in-gear protection; engage ICO (idle cut out); sends signals that gears have engaged; senses trim and rudder positions; and sends all this information to the HCM via a CANbus. And it is always ready, willing and able to react promptly and precisely to what the operator desires.

DUAL BINNACLE FUNCTIONALITY

Caudwell Marine's™ Binnacle systems come standard with each drive. Available in single side mount, single top mount and dual top mount, they are designed by one of the USA's leading industrial



design houses and have been researched with industry and boat owner groups. The functionality and user-friendliness are unsurpassed in engineering excellence - delivering beauty, brains and brawn all in one.

WARRANTY & SERVICE

Designing and developing the ultimate recreational marine propulsion system was

difficult enough; developing it to the incredibly high engineering standards, tolerances and durability standards we set ourselves was harder still.

But even harder is to ensure that the proud owners of Caudwell Marine™ systems get the best levels of service and warranty on offer.

Great service does not mean hundreds of pins in map and a dealer on every marina. Rather we have focused on quality, rapid response service and parts teams - and a smaller highly technical and mobile service network supported by satellite-downloadable drive diagnostics.

EXCELLENCE IS EVERYTHING

In today's fast-moving world of planned obsolescence and throw-away goods comes a product designed, manufactured and supported by a team of people who will never pay lip service to excellence.

Understanding standards and adopting an intolerant stance on anything but the very best is the hallmark of Caudwell Marine™ and its people.

For those rare people who have an eye for excellence, vision and class, they will understand quickly what makes the Caudwell Marine™ Axis Drive™ and its Vertical Intelligence™ architecture a true revelation in marine propulsion. //



CAUDWELL MARINE™ AXIS DRIVE™ GASOLINE RANGE

SPECIFICATIONS AND STANDARDS:

| | 250 vi | 300 vi | 350 vi |
|--|--------------------|--------------------|--------------------|
| ENGINE TYPE | V6 | V6 | V8 |
| HORSEPOWER | 250 | 300 | 350 |
| DISPLACEMENT | 3500 CC | 3500 CC | 4500 CC |
| RPM RANGE | 5500-6000 | 6000-6700 | 6200-6900 |
| CYLINDERS | 6 | 6 | 8 |
| ALTERNATOR OUTPUT @ WOT | 120 AMPS | 120 AMPS | 120 AMPS |
| COMPRESSION RATIO | 10.3 | 10.3 | 10.5 |
| FUEL / INDUCTION SYSTEM | MPI | MPI | MPI |
| DIGITAL THROTTLE & SHIFT | STANDARD | STANDARD | STANDARD |
| SOFT ENGAGE ELECTRO-HYDRAULIC CLUTCH | STANDARD | STANDARD | STANDARD |
| CLOSED COOLING | STANDARD | STANDARD | STANDARD |
| WATER DRAIN SYSTEM | STANDARD | STANDARD | STANDARD |
| ENGINE LUBRICATION | MODIFIED WET SUMP | MODIFIED WET SUMP | MODIFIED WET SUMP |
| POWER-TRAIN LUBRICATION | DRY SUMP, DIPSTICK | DRY SUMP, DIPSTICK | DRY SUMP, DIPSTICK |
| | CHECK AND FILL | CHECK AND FILL | CHECK AND FILL |
| IGNITION SYSTEM | ELECTRONIC | ELECTRONIC | ELECTRONIC |
| STARTING SYSTEM | TOUCH & RELEASE | TOUCH & RELEASE | TOUCH & RELEASE |
| GEAR RATIOS | 2.68 - 1.88 | 2.68 - 1.88 | 2.68 - 1.88 |
| C.A.R.B RATING* | 3 STAR | 3 STAR | 3 STAR |
| WEIGHT (DRY) | 360 KG | 360 KG | 375 KG |
| TRIM SYNCHRONIZATION | STANDARD | STANDARD | STANDARD |
| RPM SYNCHRONIZATION | STANDARD | STANDARD | STANDARD |
| RPM HOLD / SPEED CONTROL | STANDARD | STANDARD | STANDARD |
| EXTERNAL TILT SWITCH | STANDARD | STANDARD | STANDARD |
| DUAL RATE POWER TRIM AND TILT | STANDARD | STANDARD | STANDARD |
| THERMOSTATIC COOLING SYSTEM | STANDARD | STANDARD | STANDARD |
| 5 YEAR CORROSION WARRANTY | STANDARD | STANDARD | STANDARD |
| 3 YEAR LIMITED PARTS AND LABOUR WARRANTY | STANDARD | STANDARD | STANDARD |

* UNDER EVALUATION



OUR PLEDGE ...

Faith in our product is such that should any one of our units suffer a breakdown not of the operators doing, and not repairable within twenty four hours of breakdown, we will replace the entire unit with a brand new one anywhere within 48 hours – free* ””

*Terms and conditions apply

Supporting that pledge is our standard warranty. Caudwell Marine's™ warranty covers a three year parts and labor and a five year corrosion warranty. Please see www.caudwellmarine.com for full warranty details.



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