SMALL BLOCKS FILL THE GAP

BOMBARDIER'S E-TEC BRIGADE TAKES SHAPE

With the launch of Evinrude outboards based on new V4 and V6 blocks, Bombardier Recreational Products has filled the major 90-200hp breach in its E-TEC two-stroke ranks and now has a formidable force with which to take on the four-stroke competition. We've known about BRP's plans to fill the 90-200hp gap in its Evinrude E-TEC outboard range since they were given to the North American boating press back in April. It was never a surprise that the Canadian company was going to continue focusing most, if not all, of its outboard research and development efforts on its 'alternative engineering' E-TEC direct-injection two-stroke technology. What we in Europe didn't have a chance to see until the end of August was the new products themselves and some of the new engineering refinements behind them.

Where its flank was exposed in the middle and upper section of the Evinrude range, BRP has introduced four new models that are based on two new engine platforms. These start with a 115hp model that has a 1,726cm³ narrow (60°) V4 block. This is essentially an E-TEC version of the conventionally-aspirated 115hp two-stroke powerhead that's already in service in Evinrude's sister range as the carburettor inducted Johnson 115. This new E-TEC version is now the next step up the range from the in-line three-cylinder 1,295cm³ outboard rated at 90hp. When it goes on sale to boaters worldwide in February 2006, the 115 will be the only outboard based on the V4 block, although a 130hp version has already been announced in the US for release next year.

Before then, in January, BRP will be releasing its new Evinrude E-TEC 150, 175 and 200hp models onto the market - again based on an existing block in the Johnson range, the 2,589cm³ narrow 60° V6. Sharing the same bore and stroke, the V6 is essentially a longer version of the V4.

Where there is potential for confusion is that with the new model launches there are now two Evinrude E-TEC outboards in the range with different engines, but with the same nominal 200hp rating. One is the most powerful of the new so-called 'small-block' 2.6 litre outboards; the other is the least powerful of the 'big-block' 3.3 litre V6 series (200, 225 and 250hp) introduced last year. Both are available in 20in and 25in shaft lengths and indeed share the same drive legs, yet the smaller outboard with a 20in leg weighs 190kg while the bigger one (which is still light in its class) is a full 41kg heavier. With their narrow 60° V engines (compared with the big-block's 90° V angle) the new outboards are also slimmer and more compact.

BRP's explanation for offering the two different engines with the same rating is that they are aimed at different applications. The clue to this is in the 'HO' designation of the beefier 3.3-litre V6. HO stands for 'High Output' - the extra cubic capacity delivers more torque for the extra performance demanded for example by bassboat tournament fishermen in the USA - who like to push their craft to the limit. On the other hand, the lighter and slimmer 'small-block' motors are likely to appeal more to owners of similarly lighter (and more European-style) craft. Evidently, BRP expects significant numbers of the new motors to find homes on RIB transoms also, as half a dozen RIBs were selected to demonstrate the outboards to the European boating press on Italy's Lago Maggiore.

While most attention at this press event was focused on the new E-TEC models that fill the big 90-200hp gap in the Evinrude range, there was another significant model introduction lower down the range. Infilling between

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EVINRUDE E-TEC 115 / V4 SPECIFICATIONS:

Model:	a. E115DPL b. E115DSL c. E115DPX
Shaft Length mm (in) / Colour:	a. 508 (20") Blue b. 508 (20") White c. 635 (25") White
Weight kg (lbs):	a./b. 167 (369) c. 170 (375)
Engine Type:	Loop Charged V4 60° E-TEC D.I.
Bore x Stroke mm (in):	91 x 66 (3.600 x 2.588)
Displacement cc (cu in):	1726 (105.4)
Starting:	Electric
Trim Method:	FasTrak Power Trim and Tilt
Propshaft kilowatts (HP):	86 kw (115 HP) @ 5000 RPM
Full Throttle Operating Range:	4500-5500 RPM
Gear Ratio:	a./b. 2.0:1 c. 2.25:1
Fuel Induction:	E-TEC Direct Fuel Injection with stratified low RPM combustion mode
Alternator:	Variable Voltage Computer Controlled 133 Amp** / 1800 watt output with Regulator
Cooling:	Pressure and Temperature Controlled Water Cooled
Steering:	Remote or Accessory Tiller
Limited Warranty:	3 Years Non-Declining
Emissions Compliance:	EPA 2006 CARB 3 STAR European Union

EVINRUDE E-TEC 200 / V6 SPECIFICATIONS:

Model:	a. E200DPL b. E200DSL c. E200DPX d. E200DCX
Shaft Length mm (in) / Colour:	a. 508 (20") Blue b. 508 (20") White c./d. 635 (25") White
Weight kg (lbs):	a./b. 190 (419) c./d. 194 (427)
Engine Type:	Loop Charged V6 60° E-TEC D.I.
Bore x Stroke mm (in):	91 x 66 (3.600 x 2.588)
Displacement cc (cu in):	2589 (158)
Starting:	Electric
Trim Method:	FasTrak Power Trim and Tilt
Propshaft kilowatts (HP):	149 kw (200 HP) @ 5000 RPM
Full Throttle Operating Range:	4750-5750 RPM
Gear Ratio:	a./b. 1.86:1 c./d. 1.85:1
Fuel Induction:	E-TEC Direct Fuel Injection with stratified low RPM combustion mode
Alternator:	Variable Voltage Computer Controlled 133 Amp / 1800 watt output with Regulator
Cooling:	Pressure and Temperature Controlled Water Cooled
Steering:	Remote
Limited Warranty:	3 Years Non-Declining
Emissions Compliance:	EPA 2006 CARB 3 STAR European Union

existing 50 and 75hp units, this is the new Model 60. It is based on the same 863cm³ two-cylinder powerhead as the smaller 50, but it has an engineering feature that BRP claims is exclusive - variable exhaust control. Managed by the outboard's EMM (Engine Management Module), this system is claimed by BRP to be an industry first. It uses exhaust pressure via a valve in the exhaust housing to tune the engine. As the engine picks up speed the valve remains closed, helping it to produce maximum torque for rapid acceleration. Then, as soon as engine speed goes above 4,000rpm, the valve opens and re-routes the path of the exhaust gases thus altering back pressure to make the engine run with maximum efficiency at higher speeds. According to BRP, this tuning system lends its self to the two-cylinder configuration. With more cylinders the benefits become marginal and so the company says it has no plans to extend the variable exhaust control mechanism to bigger models in the Evinrude E-TEC range.

All of the new engines unveiled by BRP are fitted with its I-Command integrated information system that's claimed to be the first offered by an outboard manufacturer to have NMEA2000 Can BUS compatibility so that an array of GPS, depth sounders and other NMEA 2000 certified instruments can be added on a 'plug and play' basis. BRP has added its own range of digital and analogue gauges manufactured by Lowrance that are designed for this system. Also new is a multi-position cable-operated throttle control and a Raker II high-rake stainless steel propeller that's designed to make the best use of the power and torque delivered by the new outboards.

Significant though the new Evinrude E-TEC products and their engineering refinements are, what's probably more important is that they now establish BRP as a full-on alternative, with alternative technology, to take on the mainly four-stroke offerings of their competitors. Not so long ago, let's remember, two-stroke technology was written off by many as the most probably casualty of new emissions legislation. Instead, thanks largely to new engineering by BRP, this technology has disproved its doubters. Indeed, with E-TEC, BRP has made some pretty convincing counter arguments to conventional wisdom that two-strokes need be dirty, noisy and extravagantly wasteful of fuel.

The company is keen to point out that E-TECs are the only outboards able to meet without modification not only EPA and EU 2006 emissions limits, but also achieve the California Air Resources Board's CARB 2008 top three-star rating. In April this year Evinrude E-TEC outboards became the first marine engines to receive a Clean Air Excellence Award from the US Environmental Protection Agency.

As well as exploding the myth that two-strokes are dirtier than fours, BRP has also upended the popular perception that they're more fuel-thirsty and noisy. The company claims that E-TEC's stratified combustion gives "unsurpassed fuel economy at low engine speeds" while its fuel injector design, combined with computer controlled engine management, contributes to better fuel economy at higher speeds than hitherto achieved with two-stroke direct injection. Although all two-strokes burn oil, consumption, according to one ICOMIA 250-hour side-by-side test of different outboards that's quoted by BRP, is only marginally more than with four-strokes - bearing in mind that with four-stroke engines lubrication oil needs to be changed in services whereas with two-strokes there's none to change. In fact servicing, or rather the infrequency of it, is another advantage that BRP claims for E-TEC. No scheduled dealer maintenance is required for three years or 300 hours of operation. And as for noise - an issue highlighted in the amended EU Recreational Craft Directive and taken into EU 2006 - both two- and four-stroke outboards of the new 'clean emissions' generation comfortably come within acceptable limits, the main differences being in engine note - two-strokes having a characteristic 'growl' compared with the higher pitched tone of four-strokes.

Regarding performance, BRP says that its E-TEC two-strokes outperform fours by virtue of having generally better to weight ratios and because they produce a power stroke in every two compared with one in four with four-strokes.

Evinrude's new E-TEC 200 small-block V6, is cited by BRP as a good example of two-stroke power-to-weight superiority. Compared with Yamaha's 200hp four-stroke, says the company, the 2.6-litre E-TEC, weighing in at 193kg, is 81kg lighter and has about 800cm³ less swept volume but produces similar performance.

Although journalists didn't get the chance to verify performance comparisons between the new Evinrude E-TEC outboards and those of its 'clean technology' competitors, we were able to try them out on a selection of half a dozen RIBs and various conventional-hulled planing boats. General impressions were that these outboards were certainly as capable in performance as any other modern outboards, two- or four-stroke. They had no trouble getting sometimes quite laden boats quickly onto the plane and delivered plenty of performance at the top end. And noise levels at planing speeds are certainly no more intrusive than those of other RCD-compliant engines, although the engine note, which still has some of the characteristic growl of old two-strokes, is deeper than the pitch of modern four-strokes.

Only independent testing under strictly controlled conditions will reveal the truth behind manufacturers' claims - and that's what RIB International will be doing this autumn. In our next issue (February/March 2006) we will be reporting our findings from head-to-head tests of four identical RIBs each powered by the latest 250hp outboards from Yamaha, Suzuki, Mercury and, of course, Evinrude.

Bob**Greenwood**