





Honda BF 250 'Silver Bullet'

Although the new Honda BF 250 has been in the news for a couple of months, it was only last month we were able to get onboard a suitable craft with the new engine fitted, and experience first hand what we've published about the engine in The Boat Mag, recently.

Testing new engines is always an interesting job, but more so in this case because it was on a very unusual test platform.

As you can see in the pics, it was mounted on an extraordinary 7.80m RIB (Rigid Inflatable Boat) all the way from the Ukraine, and certainly one of the better examples of this genre the writer has seen. Beautifully built and finished, with a recommended horsepower rating of 250hp and a maximum transom weight of 315kg, it was a near perfect rig for the task, especially as there are very few craft that can legally carry 250hp in Australia under this length.

The Brig is actually rated for 300hp, so devotees of Mercury Verados, Yamaha 4.2's and the big Suzuki 300 would find a willing suitor in this RIB.

Apart from being unusually stable for an open craft of this calibre, the Brig 780 Eagle was a seriously clever choice in another way, too. This is basically a long, skinny, 1080kg hull with 250hp of Honda's finest on the transom pushing it, so not surprisingly, it took off like a scalded cat, cruised with aplomb and extremely good fuel economy, and delivered a ride that was so soft I kept looking for the Sealy mattress underneath it!

Truly, it is remarkably soft, absolutely attributable to what is clearly an extremely (but not declared) deep vee monohedron hull that is way sharper or deeper in the vee than you could possibly build in a conventional craft.

Why? Because when this rig comes down to lower speeds and finally to a halt, it has these massive buoyancy tubes fore and aft to ensure the stability is enough to carry a football team standing on one side. Clever, hey? You marry up an amazingly deep vee hull with the buoyancy tubes to deliver extraordinary stability at rest, and equally exceptional riding

performance underway.

This is by no means new technology we must stress, but it is a very good application of long standing, good naval architectural practice.

The other feature that will surprise conventional boat owners is how dry the ride is, thanks to the very same sponsons or 'tubes' running around the perimeter. When the hull lifts up out of the water at mid-flight for instance, it's like having two great big chines, or spray dampeners down the side, suppressing most of the spray that's zipping out from the hull's deep vee fibreglass bottom.

As a result, it can handle quite choppy water and not produce any spray over the sides at all until you start nudging into the seriously heavy stuff, in which case it does what an open boat has to do – regardless of how it's made or designed. But at that point in time, I can assure you, you wouldn't be fishing or cruising and most likely be on your way to a 24/7 rescue somewhere way off the coast.

Yep, this boat has a capacity that acknowledges its ability to work with military/SAS types who like to race ashore with full military kit and an armory of equipment, and do so in the dark of night at great speed from their submarine mother ship.

Frankly, these are boats that once upon a time were strictly military only, so it is interesting to see them emerge in the last couple of years from the new, free trade-based Europe, with boats that were previously unattainable. Well, unless you were one of the oligarchs from the Russian or Ukrainian mining or oil industry, that is!

So it was a wonderful opportunity to get our hands on a most unusual craft with exceptional performance of the kind we rarely see, much less get to experience off the Gold Coast.

For the record, the Brig 780 Eagle is exactly 7.85m overall,



2.90m across the maximum beam with the tubes inflated, and as noted, weighs 1080kg dry. It has a loading capacity of 1940kg, translating to about 16 blokes, but military people would probably cut that back depending on their equipment, whereas a crew of gorgeous Ukrainian blondes would probably increase it – just divide the 1940kg by the number and weight of people to be carried, and I suspect you'll have an even better answer.

You may wonder about the point here – but this is a craft that has genuine commercial application in the tourism business, offering "Extreme" rides to nervous little old ladies, or the young and beautiful from some of the more glamorous resorts up north.

This is the commercial path forward for the Brig 780 Eagle.

Introducing 'The Silver Bullet' . . .

We're not sure whether it was a 'light bulb moment' for one of the Honda advertising gurus in Tokyo, or it came from one

of them with a wicked sense of humour . . . but calling their latest outboard brainchild the "Silver Bullet" certainly captured international attention.

It is not a big stretch to imagine discussions in the Honda Marine Division boardroom about needing a "silver bullet" to deal with the serious level of international competition from the likes of Mercury, Yamaha, Suzuki and BRP . . . but for whatever reason, or wherever the inspiration came from, said Honda ad man has now buried one of the modern clichés.

Now, *there is* a silver bullet!

And it's a pretty impressive piece of gear too, being a very powerful 3.583cc litre, 60 degree V-6, 4-stroke, SOHC, (single overhead cam) VTEC engine with 4 valves per cylinder.

It's also a bit unusual in that it's under-square with a bore and stroke of 89 x 96mm (note the stroke is longer than the bore) with a full throttle rev range of 5300-6300rpm.

Its rated power - and I'm going to use the metric here

TBM's Ruth Cunningham enjoyed being back at the helm of Honda power - especially in this Brig 780 rocketship! She's with Honda's affable Qld Manager, Mark Suttle.

(because we all must get used to using it) is 183.9Kw (kilowatts) with 250 PS @ 5800rpm.

It uses the industry standard cooling system that is thermostatically controlled with a fully programmed fuel injection engine management system and thru-prop exhaust. Alternator output is an impressive 90 amps at 12 volts and the battery charging capacity is way more than any battery can accept at 60 amps.

It's unusual in that it has a 2.00:1 (24:12) gear ratio which Honda proudly confirm can swing a bigger prop (16") than the lesser ratios used by one of their competitors (but not all of them) and it has the standard lower unit with the forward, neutral and reverse gear box.

It's available in 3 transom lengths: L (Long) 508mm, XL 635mm, and XXL 762mm.

Similarly, the dry weight of the different lengths is 278kg, 284kg and 288kg respectively – but note these weights do not include the propeller – or any steering assembly.

Trimming is from minus 4 degrees to 16 degrees positive, with a maximum tilt angle of 68 degrees. This should lift it out of the water all but (probably) the little tiny tip of the skeg in most installations.

The New Features

Honda are making a great deal about their stylish new Aquamarine silver colour and the new graphics which introduce this new generation of Honda outboards. It seems most of the changes concern the deletion of the shadow around the graphics and type, but unless you have the old and the new Honda outboards side by side, I'm not sure any consumer would see the

difference in the colours. We couldn't – and we've lived with various Honda engines for years.

The styling of the beast is different however, and once again looks like a drop out from the Darth Vader school of design with a very powerful, slim line appearance.

Big Displacement V-6

The narrow V-6 engine concept does allow for simplified installation, especially in twin engine (let alone triple) installation packages. And whilst you're unlikely to bolt three Honda 250's on the back of your Quintrex, some of the Extreme sports people do need to do this as part of their business plan. And in this case, Honda have very cleverly minimised the width of the engine by going to the 60 degree V and at the same time allowing the engine to remain at a fairly high displacement – 3.6L is considerably more (for instance) than the Verado's 2.5L.

Power Intake Air System

Honda are very excited about "a dynamic design feature" of the BF 250 which allows external air to be drawn directly into the engine.



This emanates from the very stylish slots along the top of the cowling and it will require some thought by boatowners – especially people who have a

penchant for putting covers over their engine cowling. In this case, it will be an absolute no-no, because it will probably cook the darn thing, as the engine has been designed to naturally force-feed air into these cowling slots, resulting in cooler running, better internal air-feed into the big engine – and more fuel efficient performance.

They've also developed a new crankshaft driven cooling fan on top of the block to drive out engine heated air from under the cowling.

Racing Technology

Honda's VTEC is a process of delivering more power, torque and efficiency at every speed. But from 4,500rpm VTEC engages a special high lift cam profile by linking the rocker arms together to allow more air and fuel through increased valve openings' timing, allowing more of the previously described cooler air into the combustion chamber - resulting in more engine power from the more highly oxygenated fuel mix in the cylinders.

This extra 'shot' of air and fuel into the fuel mix at the point of combustion, as most readers will be aware, will result in more engine power. Yes, it will rapidly increase the fuel consumption (that's where the extra power comes from) but this only happens when you need it - fast - and the skipper floors the throttle.

New Shift Load Control

This is clever. Honda have introduced a 'shift load' control system which once again utilises the engine management system; this analyses the engine speed, throttle position and in turn changes the ignition timing modifying engine torque – so if you like, think of it as momentarily going into idle before you've even touched the gear shift when you're manoeuvring in and around the wharf. Clever, because quite

often this can be bloody difficult if the engine is revving a bit too high, or you've got a big prop on the back of it, and you really want the engine to shut down momentarily while you change gears and jostle in and around the fuel wharf for instance, just quietly going in and out of gear to kick the boat backwards and forwards as you need.

With some of these big engines, that is quite hard and I'm sure this process has been developed by Honda engineers who enviously watched the big diesel game boats with their trolling valves, doing just this in close quarter manoeuvring.

"Why can't we do that with an outboard?" they must have wondered, because somewhere along the line, some very experienced people have said "Okay, why don't you develop something that will make gear shifting easier, smoother and safer at low speed?"

And they have.

Automatic Idle 12volt Charging

Another clever development with the big Honda is one of those "should have thought of it years ago" ideas, wherein at idle speed, if the total electrical demand requires more power from the onboard electronic equipment (the engine, pumps, plotter, etc) the ECU increases the alternator automatically to produce higher output, even though the engine is only operating at idle speed.

Again, why didn't we think of that before? In most engines, the fall off in alternator power at low revs can be dramatic, and can actually result in running down batteries - even though the operator thinks the engine is charging the whole system.

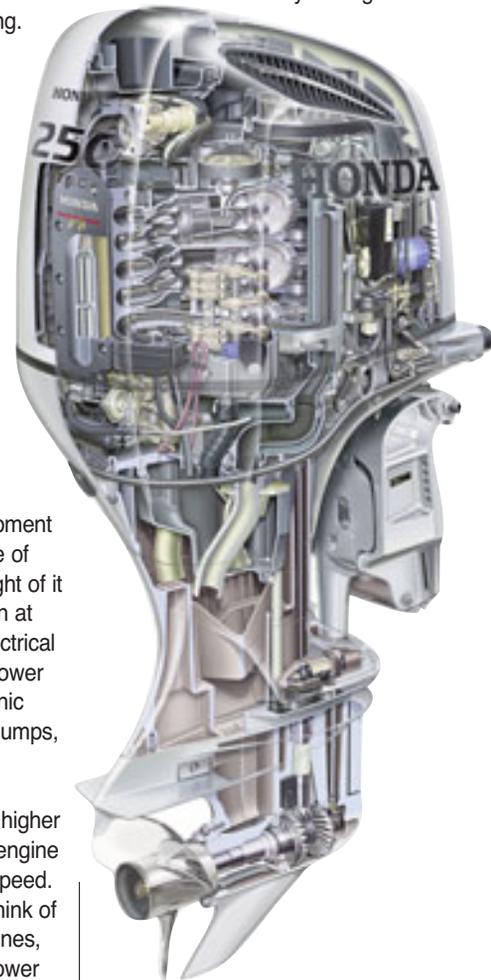
Not here – the engine management system ups the ante for the skipper whilst he's off flashing the plastic at the fuel wharf operator's desk.

Economy Controls

The new V-6 has a couple of other interesting features which are also derived from the Honda's engine management system.

The new V-6 again features Honda's patented BLAST technology wherein rapid throttle movement (as in acceleration) activates BLAST ("Boosted Low Speed Torque") which significantly improves hole shot and acceleration.

In plain speak, this is to say that as you first accelerate any planing boat off the mark, you've got



to lift the 'deadweight' (displacement) of the boat up and out of the water (this is what's called "the hole shot"). Once you've done that, the next phase of activity is to keep the boat accelerating quickly forward, so that you don't fall back in the 'hole' you've just made, and/or you can go forward to the point where you can then pull the throttle back

and settle back into cruising mode.

Once again, we see the fuel and engine management system doing the job for the skipper – immediately the engine senses the skipper needs a big boost in the performance to get weaving, the ignition is advanced, the fuel/air mix richened, pushing more air and fuel into the combustion chambers, thus providing this so-called “hole shot” performance boost.

It's not just advertising hyperbole, I can promise you; we experienced this ourselves in quite a few situations with our 8.2m long range cruiser's twin Honda 150s.

One coming to mind concerns *Far-Away* leaving Hill Inlet in the Whitsundays, when we had to cross the barred entrance on a falling tide, with a typical Whitsunday 25-30 knot wind running down the channel outside the shoal entrance. As we entered the shoal zone, about half way across, the waves started really standing up, to the point that before we'd actually cleared the sand bar we were crossing, we were confronting 6-7 foot left breaks that Mick Fanning would have been excited about.

It was a case of slamming the pedal to the metal - or find a 4WD, but our two 150 Hondas opened-up beautifully, providing that wonderful boost of performance out of the trough we were in, right on top of the sand bar.

In truth, we actually touched the bar with the skegs, but we had just enough water and enough power to lift the 4 ½ tonne cruiser clean over the sand bank. It was probably the best example of hole shot performance we'd ever had – and we survived the day largely because of it. If those engines had “bogged down” (as the early 2-strokes did so often) for even a few moments, it would have been all over Red Rover, because we didn't have the few moments to spare.

Specifications and dimensions

HONDA	
250	
VTEC	
	
BF250	
LD / XD / XCD / XXD / XXCD	
Type	LD / XD / XCD / XXD / XXCD
Engine	4-stroke, SOHC- VTEC, 60° V6, 4 valves (per cylinder)
Displacement (cm³)	3583
Bore x Stroke (mm)	89 x 98
Full throttle RPM range	5,300 - 6,300 rpm
Rated Power (Kw (PS) / RPM)	183.9 (250) / 5,800
Cooling system	Water cooled system with thermostat
Fuel system	PGM-FI (programmed fuel injection)
Ignition system	Electronic PGM-IG
Exhaust system	Under water discharge (through propeller boss)
Alternator output	12v -60A
Battery charging capacity	12v -60A
Gear ratio	2.0:1
Gear shift	F-N-R
Overall length (mm)	920
Overall width (mm)	625
Overall Height (mm)	L 1760 / X 1887 / XX 2014
Transom height (mm)	L 508 / X 636 / XX 762
Dry weight (kg) no propeller	L 278 / X 284 / XX 288
Trim angle	-4° - 16°
Tilt angle	68°
Engine trim & Tilt	Power trim & tilt



Lean Burn Control

Now this is what I mean about fuel management systems working as a compliment to each other off the same technology.

Once the boat is up and running, and scooting along the top of the water, the skipper normally hauls back to the boat's sweet speed, usually in the 4,000-4,500rpm zone and not coincidentally, about 4,250 in most cases.

At this point, the skipper's got the boat up on top of the water, everything's settled down for the day or the run, and the skipper then can gently haul even further back on the throttle(s). Instantly, the fuel management system says “Hey, we don't need the valve settings we've been using to get up and out of the water – this is now just a sweet cruising situation.”

Then the ECU buttons off the valve settings, the oxygen and fuel flow, to create this ‘lean burn’ control to further improve the fuel consumption just in the cruising mode.

It actually works on the principle that you're going to leave the throttle alone and just let the computer do its thing.

Even in this big 3.6L engine, it was dramatically effective, as we were logging figures from 18.7 L/ph at 3,500rpm (how good is that?) 27 L/ph @ 4,000rpm to the major cruise point of 4,250 (30.5 L/ph – excellent!) to one of the best figures we've ever recorded in this class of engine, 34.8 L/ph @ 4,500rpm.

Now we stress this was deliberately setting the boat to run on the EComo (economy controlled motor) to maximise the fuel efficiency of this setting, but it does show dramatically how much better the boat can run if it's backed off to engage the Ecomode. Obviously, we were in probably the lightest, most ‘easily’ driven boat this engine will ever be bolted onto (a shrewd move by Honda) but even so, the fuel consumption increases

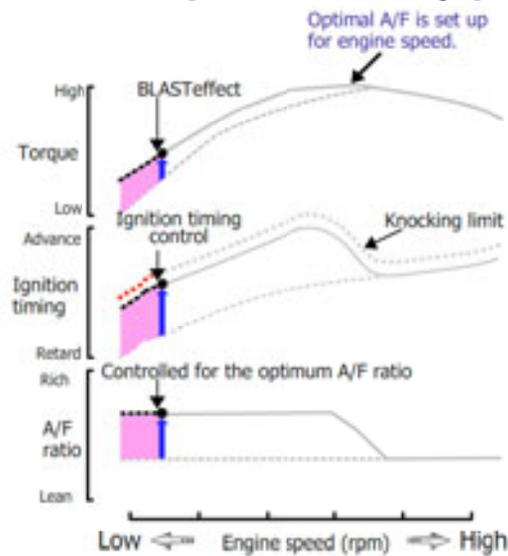
BLAST - Boosted Low Speed Torque

- Honda's unique, intelligent technology in which the ECU provides optimum control of fuel injection and ignition timing during rapid acceleration. This increases torque to deliver improved off-the-line acceleration (hole-shot performance).

BLAST™
BOOSTED LOW SPEED TORQUE



[A/F ratio control image]



dramatically to 49 L/ph (5,000) all the way through to a maximum we could get through it, of 85.8 L/ph @ 6,000rpm.

Now these are exceptionally good figures all round, even the flat out, WOT (wide open throttle) figure of 85.7 L/ph. Again, we recognise that this is largely due to running on a long, skinny, very light boat – it's the perfect craft to get the best possible fuel consumption figures.

That said, in our experience with these more sophisticated engines that have prodigious computer power backing up the skipper, I know the fuel consumption wouldn't get that much worse. In other words you might get a 15-25% increase in fuel usage in a worst case environment, but over the years, we've rarely see more than this in on-water performance.

We've had a lot of experience with these types of engines, too – as we did hundreds of hours with our 150 Hondas, and whilst there was a big difference between running *Far-Away* bone dry, completely empty at its true BMT hull weight (ready for the highway, with hardly any liquids or fuel) of around 3.9 tonnes, compared to running with all

fuel, water, dory, cruising gear, film equipment (etc) onboard, which took our weight up to around 4.7-4.8 tonnes, the 2 x 150 Hondas only lost about 15-20% efficiency in the process. And I suspect the same thing will happen here .

This is a beautifully engineered bit of kit, with a very powerful computer management system second guessing the skipper pretty well all the time.

At every point of the performance parameters (ie, no matter what the skipper does) the BF250's computer mapping will second guess the new plan, and adjust the ignition, air, fuel and valve timing mix accordingly.

Application

This is almost certainly going to go down as another one of the great engines of the marine world.

Honda always comes in behind the releases of the other big outboard manufacturers; they always stand back and watch what the others have done and claim, and then quietly sit down in their R&D room, and figure out how they can build a better mouse trap, so to speak.

They're always a year or two

behind everybody else. Why? Because the Honda Corporation is absolutely paranoid about the product's reliability, and the protection and enhancement of the Honda name, the (relatively!) tiny Marine Division just can't afford to get it wrong.

So they are always behind everybody else, having tested and re-tested their engines until they are pretty much, er, (silver) bullet proof!

This engine has terrific application in a wide variety of Australian marine craft, ranging from its very obvious application to the new generation of 7.0-8.5m plate aluminium craft, and multiple installations in bigger craft from both the GFR and plate alloy camps, for cats, monos and tris.

But I think it will be at its finest as a single installation, because it will combine Honda's exceptional reliability with unusually good fuel efficiency, an amazing power to weight ratio – 250hp for 275kg (+ prop) - which is pretty much the name of the game in 2012, going forward.

For the record, the Honda people are quoting prices in the range of \$29,000-\$31,000 for the unit, but there's a fair bit to

sort out there with any given installation. It depends on instrumentation (this engine is NMEA2000 compliant, so it can run all its engine performance data through your Garmin, Furuno type electronics) as well as the types and size of the propellers chosen, battery types, and the methodology of steering, because this also effects the actual cost of the unit and (obviously) its installation.

That said, if you walked into your local Honda Marine dealer and put \$30K down on the counter, I'm pretty sure you could repower your pride and joy with what must be declared is truly, the "state of the art".

It's a terrible cliché I know, but damn it, they've just killed off the other one!

Honda BF250 and support supplied by Geoff Newman and the team at Runaway Bay Marine Service. Talk to them about that special re-power project and the installation of the most suitable Honda 4-stroke for your rig. No obligation, just good, friendly advice and care.

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