



The peerless 90

The OptiMax 90 has no peers, reports Andrew Norton...

In more than 25 years of professionally evaluating outboards, some have stood out from the crowd. One is the OptiMax 90 (right), a Direct Fuel Injected two-stroke that is unmatched in its power range, two or four-stroke, for performance and fuel efficiency.

Currently one of only two DFI 90s to meet CARB 2008 and OEDA '3-star' exhaust emission requirements, the OptiMax 90 is the middle engine of a trio of DFI two-strokes from 75 to 115hp and has the Orbital Combustion Process (OCP) which combines traditional two-stroke performance with very low fuel consumption for output.

The OCP utilises a combination of stratified and homogenous combustion with low-pressure injection of petrol and air at 5.4bar or 80psi via a 1:1 belt-driven air compressor. In the stratified mode (up to 1800rpm) the atomised air/fuel mix with a fuel droplet size of only five microns is injected near the spark plug for an air/fuel mix of 14.7:1, although the overall combustion chamber air/fuel ratio may be as lean as 70:1.

Above 1800rpm, homogenous combustion, where the overall combustion chamber air/fuel ratio is 14.7:1, is needed to provide the power and torque to plane a hull. This results in significantly greater fuel flow, but still only around 15 per cent more than comparable output four-stroke outboards, which return maximum fuel efficiency in the 2000 to 4000rpm range.

Via an electric pump, lubricating oil is injected directly where needed, resulting in fuel/oil ratios way below that of a comparable oil injected carburettor two-stroke outboard.

Having such a large displacement three-cylinder powerhead (essentially an OptiMax 200 powerhead cut in half) the 90 doesn't troll as smoothly as the direct competition, although once 1000rpm has been reached vibration levels are comparable. But the fuel injector "click" of the 90's low-pressure injectors does make it slightly noisier than an Evinrude E-TEC 90.

SMARTCRAFT INSTRUMENTATION

As with its four-stroke EFI Mercury F90 counterpart, the OptiMax 90 has SmartCraft instrumentation displaying fuel flow, range-to-empty, temperature, low lubricating oil and battery levels (unlike the E-TEC 90 the OCP system needs a "healthy" battery to function) and other useful information. The Honda BF90, Suzuki DF90 and Tohatsu TLDI 90 all miss out on these facilities, which, in my opinion, should be available with a low emissions outboard.

Spinning an 18in stainless steel Quicksilver Vengeance prop on a Stacer 489 Barra Pro and pushing a total of 900kg (including two adults) the OptiMax 90 was

a perfect match for this incredible hull. Although there was a slight oil smell when backing upwind the engine started instantly hot or cold and, providing the antivibration plate was kept at least three-quarters immersed, power astern was good.

Trolling at 550rpm the averages were 1.9kmh and 0.7lt/h with 4.5kmh and 1.1lt/h at 1000rpm.

At 2000rpm, on homogenous combustion, the fuel flow had risen to 4.2lt/h with a speed of 8.7kmh, while a clean plane occurred at 24.6kmh and 2800rpm. But "flooring" the throttle from trolling rpm planed us in just three seconds with a maximum speed in less than 15 seconds.

Cruising at 4000rpm the averages were 60.2kmh and 12.1lt/h with no prop ventilation occurring through a full-lock figure of eight turns. At fast cruise rpm of 5000 we averaged 83.5kmh and 17.8lt/h with stunning WOT averages of 107.4kmh and 28.4lt/h where we could still talk normally at the helm.

Initially, I disputed these figures as, theoretically, the 489 shouldn't be this quick with an 18in prop, but then I've never experienced inaccurate results with SmartCraft instrumentation before. The 489 seemed to be going this fast with the wind at the helm and a rapidly shrinking Lake Macquarie!

Because the cylinders are canted to starboard, access to the spark plugs, air/fuel



injector block, water vapour separator and ignition coils is very good. Mercury Marine recommends servicing the 90 every 100 hours, or annually after the initial 20-hour service and if this is performed at an authorised service centre, the recreational-usage warranty is five years.

SPECIFICATIONS

MERCURY OPTIMAX 90

Engine type:	.. Loopcharged two-stroke
Cylinders:	..... Three in line
Prop HP at rpm:	..... 88.7 at 5375
WOT rpm range:	..... 5000 to 5750
Piston displacement (cc):	..... 1526
Bore x stroke (mm):	..... 92 x 76
Ignition system:	..... Digital CD with electronic timing advance
Charging circuit (amps):	..... 60 with voltage regulation
Break-in period (hrs):	..... 10
Fuel delivery:	... Dual stage Orbital DFI
Fuel type:	..... ULP 91 RON
Fuel capacity:	..... Tote tank
Oil type:	... TC-W3 Quicksilver Premium
Oil capacity:	..... Undercowl 4.7lt
Fuel/oil ratios:	..... 44:1/400:1
Gear ratio:	..... 2.33:1
Transom heights:	..... 20/25in
Weights (kg):	..... 170/173
Rec. retail price:	..... \$12,800/\$13,130
Spare Vengeance prop:	..... \$1000
Service costs*:	
Year One:	..... \$548
Year two etc:	..... \$318

*As per manufacturer's recommended schedule excluding parts. Prices current as of June 2008.