



YESTERDAY ONCE MORE

A pair of Aussies give this British-bloodline single a modern V-twin overhaul

■ TEST ALAN CATHCART ■ PHOTOGRAPHY KEN WOOTTON

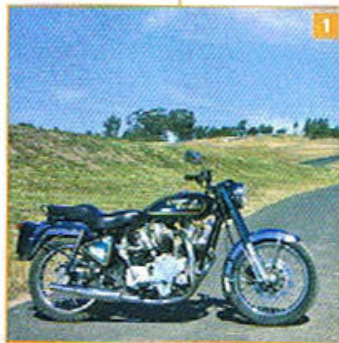
It's very rewarding to revisit a bike and find that the problems you encountered with it first time around have all been addressed. This is what happened to me on a recent trip Down Under, when I rode the Aussie-built Carberrry-Enfield 1000 V-twin in final pre-production form, the one I'd first sampled in prototype guise three years ago.

Today's fascination with all our yesterdays continues to spawn two-wheeled recreations of the Way It Was. The former Indonesian importer of the Indian-made Royal Enfield singles is in its 54th year of consecutive production, yet has remained caught in a time warp more out of necessity rather than by choice.

Australian Paul Carberrry, 49, has had first-hand experience of the drawbacks as well as the pleasures of such a ride down memory lane. This is why he decided to make the past live again but in a modern context, using today's design technology and uprated materials to deliver a superior rendition of history on wheels.

Carberrry's idea was to create a one-litre V-twin double-barrel engine based on a pair of Royal Enfield 500 Bullet cylinders and heads sitting on a specially designed crankcase, to produce an up-to-date blend of ancient and modern that's both properly designed and correctly engineered.

"The basic premise was to create a classic-style 1000cc British V-twin utilising





1. The prototype has covered thousands of kilometres
2. Pushrod valves are retained in dry-sump motor with a 60 percent balance factor
3. The frame uses a braced section of the Bullet chassis attached to a twin-downtube front section

3

ENGINE

Engine type Air-cooled, OHV, pushrod, four-valve, 55° V-twin
 Bore x stroke 84 x 90mm
 Displacement 998cc
 Compression ratio 6.5:1
 Ignition Electronic CDI, Bosch trigger
 Fuel system 2 x 28mm Mik-Indian CV carburettors
 Fuel type 91 RON

TRANSMISSION

Type Five-speed
 Primary drive Duplex chain
 Clutch Wet, multiplate
 Final drive Chain

CHASSIS AND RUNNING GEAR

Frame type Tubular-steel duplex
 Rake 27.5°
 Trail NA
 Wheelbase 1475mm
 Suspension Royal Enfield
 Front: Leading axle telescopic forks, 150mm travel
 Rear: Twin shocks adjustable preload, 100mm travel
 Wheels Wire-spoked, steel rim
 Front: 3.25 x 19 Rear: 3.5 x 18
 Tyres Dunlop Roadmaster T1100
 Front: 100/90R19 (57H)
 Rear: 110/90R18 (61H)

Brakes
 Front: 300mm disc, two-piston Brembo caliper
 Rear: 150mm single leading-shoe drum

DIMENSIONS AND CAPACITIES

Weight 196kg (oil, no fuel)
 Seat height NA
 Fuel capacity 14L

HOWSITGO?

Power 37kW @ 4800rpm (claimed)
 Torque NA
 Top speed 170km/h (claimed)
 Testbike Carberrry Enfield Co.
 Melbourne, Australia
 Contact www.carberrryenfield.com
 0404 966 707
 Price \$20,000 (approx.)

as many standard Royal Enfield parts as possible," Carberry said. "I'm aiming to offer a well-mannered, torquey cruiser with the look, feel and sound you'd expect from a bike with traditional British bloodlines, but with enough technology to make it a practical, everyday workhorse in modern conditions, at an affordable price."

To create the Carberry-Enfield V2 motor, Carberry called on the services of Melbourne-based development engineer Ian Drysdale, creator of the exclusive 1000cc Drysdale V8 sportsbike and a man with a formidable track record of thinking outside the box.

It's a big leap from manufacturing the only street-legal, four-camshaft, 32-valve V8 sportsbike in the world that anyone can buy to concocting a dedicated, pushrod V-twin engine for a retro roadster, but when your name is Ian Drysdale, stuff like this is something you take for granted.

"It was an enticing challenge to produce something low-tech on two wheels, for a change," said Drysdale, whose CV before creating the Carberry-Enfield V2 motor included a wide variety of esoteric projects in myriad specialist fields. It's like adapting the mechanical swan used in the Australian Ballet's production of *Swan Lake* to radio control. Or converting ATV quads for use by paraplegic farmers in working the land. Or producing a range of ATVs for Chinese

manufacturer Linhai already in production, some with a 520cc, liquid-cooled, 90-degree V-twin motor entirely created and developed by Drysdale. Or creating the Drytech 2x2x2 — a hydraulic two-wheel drive, two-wheel steer, two-stroke enduro bike now on permanent display in the UK's Donington Collection. Or developing a 1600cc, pushrod V-twin motor rejoicing in the name of Godzilla for another Chinese manufacturer, with a supercharger platform already incorporated.

You get the picture — this is a guy who creates things. Drysdale is a 21st century motorcycling maverick whom it's impossible not to admire, an engineer of eclectic vision and infinite imagination who asks not why, only how.

Except — well, maybe just once did the phrase "why would you want to do that?" pass his lips, when Paul Carberry came calling, seeking to commission Drysdale Engineering to build a pushrod V-twin engine using Enfield components.

"The Enfield's a lovely little motorcycle, but it is a little one and that's the only thing against it nowadays, when everyone's going retro and neo-classics are selling so well," Carberry said.

"My ideal bike's always been a V-twin and today you need the extra performance which that offers, just to keep up with modern traffic and generally feel comfortable on it in

everyday use. The Enfield's just a little bit lean on power, so adding an extra cylinder takes care of that, as well as making the kind of bike I like — and I know other people do, too."

His main design parameters for the V-twin Carberry-Enfield engine focused on keeping production and maintenance costs to a minimum via the worldwide availability of Enfield parts. He wanted an engine that would be simple to work on but that "looked good, sounded good, was fun to ride and, above all, was reliable."

In pursuit of that aim, the prototype 998cc Carberry Enfield 55-degree V-twin engine measuring 84 x 90mm has now covered tens of thousands of kilometres of road testing in his hands, fitted in a twin-shock frame made by Carberry himself.

The frame employs a braced section of the Enfield Bullet chassis at the rear mated to a specially designed front section with twin downtubes and a double-frame backbone, rather than the single downtube/backbone of a stock Enfield.

The overhead-valve, dry-sump engine features pushrod operation of the two valves per cylinder, with the desired 60 percent balance factor achieved by heavy-metal weights plugged into the crank flywheels, thus obtaining a level of smoothness with the relatively tight cylinder angle which might otherwise be procured only via one or more

1. Gearing has been raised by four teeth on engine sprocket
2. Single-disc front brake
3. Drum brake and chain run on the left





Gearing has been raised by a massive four teeth on the engine sprocket

power-sapping counter-balancers, of which there are none.

The crankcases accommodate a pair of Enfield 500 Bullet cast-iron cylinders surmounted by complete Madras-made cylinder head assemblies, with original Enfield valves and springs, as well as pistons and conrods.

Pushrods are also stock Enfield, matched to specially made hydraulic lifters which are accommodated above the standard Royal Enfield cams without modification to the cylinders.

The latter are presently vintage-era, cast-iron numbers, as used on the Bullet single for the past half century. But on the customer V-twins commencing production in July this year in Carberry's new factory in the quaintly named Launching Place township east of Melbourne, owners will have the choice of opting for the aluminium barrels now employed on the Indian manufacturer's all-alloy Electra engine which is pretty unusual today but actually very welcome, because we run an idler gear off the crank which allows one exhaust cam to work in the same direction as it used to on the Enfield single, but the other in the opposite direction on this V-twin application

This will also pave the way for fuel injection and Euro 3 emissions compliance from 2009 onwards but, in the meantime, the Carberry V2 motor carries a pair of 28mm

MIK-Indian CV carbs, with ignition provided by a Harley-Davidson electronic CDI with Bosch trigger.

The all-new roller-bearing crankshaft (which, unusually for a motorcycle, incorporates the ring gear for the electric start) is supported by two main bearings on each side and the high-pressure high-flow oil system features twin pumps and a spin-on filter.

Behind the standard Enfield primary cover lies a duplex chain primary drive to the separate, five-speed Enfield gearbox, matched to a beefed-up Enfield wet clutch, while gearing has been raised by a massive four teeth on the engine sprocket (25 teeth to 29 teeth, so about 12 teeth at the back wheel!), to take account of the V-twin's extra performance compared to the OHV single.

"We think this engine is capable of being tuned to develop about 80hp [60kW] or so," Drysdale said. "The Enfield camshafts we're using at present all have symmetrical lobes, which is pretty unusual today but actually very welcome, because we run an idler gear off the crank which allows one exhaust cam to work in the same direction as it used to on the Enfield single, but the other in the opposite direction on this V-twin application

— and the same for the inlets.

"It's a bit of a timing nightmare but, surprisingly, we've ended up within a couple of degrees of a standard Enfield. But the soft-cam profiles mean there's still a fair bit of extra power to access reliably by playing with cam profiles and timing now we have hydraulic lifters, plus the engine is capable of being taken out to 1300cc quite safely, which would produce a very torquey, enjoyable ride.

"Paul's not looking for superbike performance, just extra zest from a sports version, if needed — and judging by what [renowned Swiss motorcycle chassis designer] Fritz Egli has got out of the single with his 636cc Super Bullet single [actually, 47.5hp [35kW] at 5100 rpm — AC], there's lots of potential there remaining to be unlocked. But the present 50hp [37kW] this engine makes at 4800rpm is more than enough to meet the expectations of Paul's target customers."

I'd already spent a day aboard the world's only Enfield V-twin three years ago, on a ride to the Melbourne suburb of St Kilda, including a handful of laps of the city-centre public roads grand prix circuit in Albert Park, where the Australian F1 GP is held

each year. The Carberry-Enfield V2 hadn't disappointed, except at the start when the electric starter sourced from an Indonesian-built Toyota car had taken the day off.

It turned out that the only problem with having the ring gear on the crank was that the suction from the pistons going up and down was sufficient to overcome the spring in the solenoid. Whoops — small redesign needed to install a strong enough spring, which allows the solenoid to still work.

Not too big a hardship, though, because with the V2's low 6.5:1 compression and one cylinder to help the other along, it proved an easy bike to kick-start once I'd perfected the required technique, sending the V-twin motor into a lolling idle. You do need to make sure the bike's in neutral when you kick-start it, though — there's lots of clutch drag which prevents you doing so in gear and neutral isn't at all easy to find, even at rest with a dead engine.

Its archaic, four-speed Royal Enfield transmission was really the only thing wrong with the prototype Carberry V2 when I rode it first time around, which otherwise combined period charm with modern functionality. For there was nothing modern or charming about the gearbox.

It was bad enough that engaging first gear at rest was impossible without a crunch, or that neutral was hard to find except by hand once I'd stopped, or else appeared when I didn't want it (a double up-stab at an upward gearshift was frequently necessary), or that bottom and even second gear were too low

to be used except as a means of getting off the mark en route to the only gear I really wanted, which was top (aka fourth). But the ratios were all wrong for a torquey V-twin like this, so that the closed-up spacing of the bottom three ratios plus the big gap to fourth made a five-speed gearbox that worked properly essential on a bike like this.

Fast forward to 2008 and Paul Carberry has transformed his double-barrel shotgun of a motorcycle into a straight-shooting, pleasurable ride down memory lane, but in a modern context, as a ride out into the countryside north of Melbourne for some brisk laps of the Broadford track confirmed.

The flawed four-speed gearbox full of neutrals has been replaced by a smooth and precise-shifting, five-speed transmission sourced from the Bullet Electro, which doesn't even necessitate using the light-action clutch to change up.

In spite of being designed for a single, its ratios are much better adapted to a torquier and more powerful V-twin application — and I didn't miss a single gear all the time I was on the bike. Sorted!

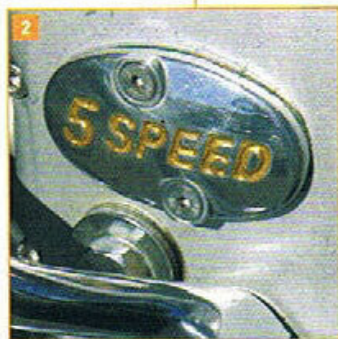
Carberry also refined the carburation and valve timing to improve response and pick-up from down low, as well as providing foot operation for the electric starter — a neat touch. So, now to get the Double Barrel motor firing, you press the little pedal mounted in front of the right-foot gearchange with your toe (provision is made on the Carberry V2 for mounting the shift lever either side) and the engine

immediately cranks into life, before settling into that smooth, lazy-sounding idle.

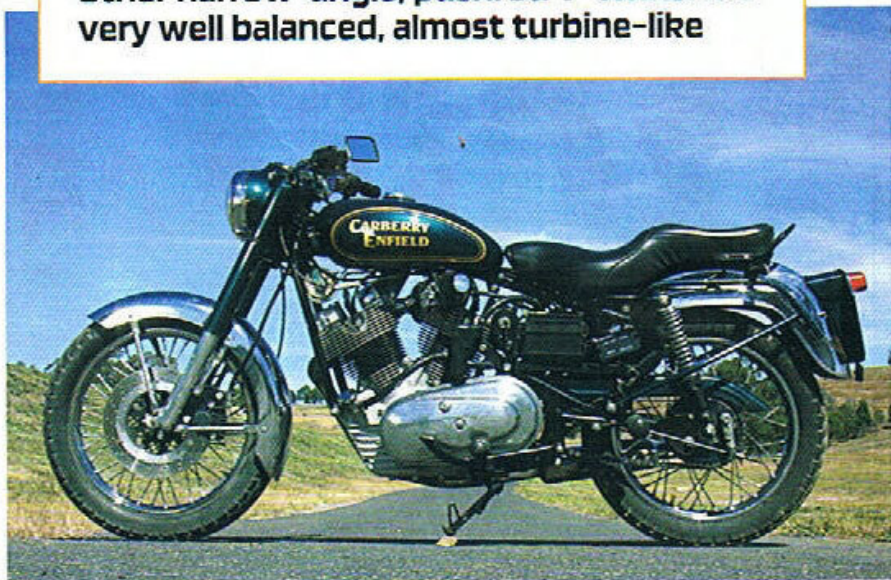
Having a left-foot shifter fitted would prevent you occasionally brushing the starter pedal with your foot as you change gear, but because it needs quite a firm prod to operate the diaphragm which works the starter motor, you don't risk doing so inadvertently while the engine is running, even with a right-foot change.

The zesty performance of the C-E V2 motor is pleasing, although the thing that strikes you most is how smooth it is. There are none of the tiring tingles of other narrow-angle, pushrod V-twins sharing the same simple-is-best retro charm. It's very well balanced, almost turbine-like, with only a little vibration through the seat — and none through the footrests or handlebar. The result is a 55-degree V-twin that's as relaxing to ride as a 90-degree one, achieved without the use of a balance shaft, just through clever engineering.

And there's just the same flexible, forgiving, torquey punch as on any Ducati desmodue, with the Carberry V2 happy to pull away wide open in top gear from as low as 40km/h on the Enfield speedo, without a hint of transmission snatch — nor, it must be said, a great deal of haste. You'll keep up with traffic quite easily, but 37kW for a 200kg bike isn't a recipe for particularly sporty performance, just easy-going riding with quite acceptable pick-up out of turns from a closed or partial throttle and good top-gear roll-on from 80km/h onwards. It's a sweet



There are none of the tiring tingles of other narrow-angle, pushrod V-twins. It's very well balanced, almost turbine-like



1. Ian Drysdale (left) and Paul Carberry — the men behind the re-engineering of a classic
2. Five-speed gearbox has been retained from the Bullet



It's a sweet and surprisingly sophisticated power unit that's quiet and refined, at odds with its humble retro antecedents

and surprisingly sophisticated power unit that's quiet and refined in operation, at odds with its humble retro antecedents.

And there isn't the engine clatter you get from Enfield singles, presumably because this twin-cylinder version was blueprinted and engineered properly. It gallops along well in top gear at an indicated 120km/h, when I'd guess the motor would be turning at around 3500rpm. It's quite long-legged and surely more practical to ride in real-world conditions than a Royal Enfield single, mainly because it doesn't run out of breath at 100km/h like a 500 Bullet.

The Carberry-Enfield V2 is a promising motorcycle which deserves to reach a wider public now that Carberry has sourced the investors to put it into production at last.

"We've got several orders already for complete bikes retailing at \$20,000 plus tax," he said. "We expect to deliver the first bikes in August this year, but we're also making individual engines available at \$10,500 each and already have interest in these from people who want to build their own specials. We're also happy to supply these to any chassis specialists around the world who want to create their own Enfield-based, V-twin motorcycle — and of course they can even tune the engine if they want to, beyond the standard spec we'll be supplying it in."

Considering that Over Racing in Japan

has won many Historic races there with an Over-Enfield classic racer and that Isle of Man ace Steve Linsdell finished second in the 1981 Classic Manx GP with a tuned Seeley-Enfield 500, there seems plenty of performance potential locked up in that Indo-Australian hybrid motor. Log on to www.carberryenfield.com for more details.

Carberry is convinced that his V2 engine deserves a wider audience. "We're all set up to begin series production — and that we will do later this year," he said. "But my hope is that Royal Enfield or another manufacturer, perhaps in China, will take the V-twin project on themselves."

Enfield's CEO, Mr Siddhartha Lal, came here to Melbourne a while ago to look at the bike, but we've since heard nothing more from them. However, we've had strong interest from China in our licensing the engine to a manufacturer there so they can build complete motorcycles themselves without needing to source parts from India to still keep the price low. So it may happen that way, even if it wouldn't be much of an Enfield any more.

"But the main thing is to keep the bike simple and the cost to the customer down, because so many people today are paying for technology they just don't need."

Which brings us back to where we came in. Yesterday once more? 🍀



Main: The Carberry next to the Bullet looking as authentic as the real thing
1: No digital display

