



Our
Triumph
acceleration
speed to match a
FireBlade. Pip pip!

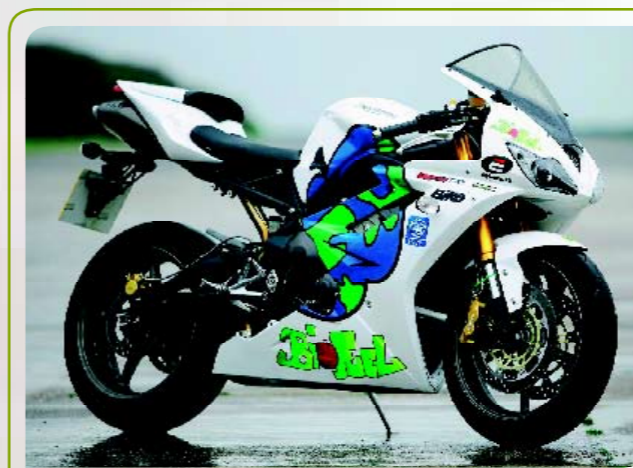


PROJECT BIOFUEL PART 4

Fast, fruity and finished

Late last year *Bike* struck upon a plan to create an apple-powered bike. Triumph came onboard with the loan of a 675 and sixth formers from a local school volunteered to brew the apples into cider and then to distil it into bio-ethanol. Last month we fired up the bike on the dyno. This month it's time to see what it will really do

BY RUPERT PAUL PHOTOGRAPHY BY CHIPPY WOOD



STORY SO FAR

We've got a Triumph 675 Daytona and remapped the fuelling so it will run on commercially available biofuel. It makes more power everywhere. Meanwhile the worker elves at Prince William School, Oundle have spent four months making 2.5 litres of bio-ethanol from about 2500 windfall apples. We've squandered a litre of this magical stuff on tweaking the fuelling further to run on apple hooch. That leaves 1.5 litres for the world home-brew fuel speed record.

Speed kills, goes the old saying. But if it does, it's taking its time. I've been coming to Bruntingthorpe Proving Ground to ride motorcycles at maximum speed for 21 years, hunkering down behind tiny screens, screwing throttles open, hearing airboxes howl and watching that vast, familiar runway narrow into a strip of grey between two green blurs.

But it's never felt this good. Every other time, the fuel came out of a petrol pump. This time it's plipped, drop by agonising drop, from a rat's nest of cobbled-up distillery equipment in a cramped store room at my local school. I know, because I helped make the damn stuff. At the rate of one drop a minute.

The 675's choppy, sporty suspension makes little sense at first, bouncing us over the joints between the giant concrete slabs. But as 120mph becomes 130mph, the shocks fade and a strange stillness creeps through the bike. At 150mph we're billiard smooth, glued to the track. It's the easiest thing in the world to make out the faces of my fellow fuel makers, straining for a good look as the blue and white wheeled thing howls by.

Apples, dead dinosaurs. It's all the same to an engine...

It's a small miracle we're here at all. A few weeks before, having witnessed the Triumph 675 make 111bhp on what was effectively triple-distilled cider, I spent the next few days feeling slightly stunned. Or at least I imagine that's how I might have felt if I'd



had the time to check. But you know how it is – the day job got busy, and what with lending the bike to the school, booking the runway for the speed test, hunting down sponsors' logos and checking the fuel production, I was left with a nagging feeling that I'd forgotten something important.

No matter. We now knew the fuel was going to work, so we needed a new colourscheme. Some of the school's Year 10 students had been working on designs, so it seemed fitting to inspect their artwork in the fuel distillery, which by now had moved out of the classroom to a storeroom next door. Reaching a peak of five interconnected stills during the final frantic week of production, the place was a mess of electrical cables, rubber tubing, Winchester jars and elaborate glassware. Half-distilled fluids sat in flasks and beakers. The floor was sticky with spilled fruit juice, and a sickly sweetness hung in the air. It looked like the aftermath of a month-long narcotics experiment by Gilbert Shelton's Freak Brothers. Inhaling this miasma of influences, I went for Jess Roberts' 'Biofuel' logo, done in oil chalk. I liked it because it was original and fun. Better still, like many of the other designs, it was the antidote to macho modern graphics.

Altamura in Camberley, Surrey had already agreed to paint the bike, so after checking my choice with the guys in the office I scanned Jess' artwork and mailed it over. As an afterthought I added a little apple design she'd done. Perhaps it would look good on the tail unit.

Next day brought an anxious call from Paul Martin, Altamura's boss. 'This design you sent me – it's not working hard enough. Can we play around with it a bit?' Sure. A couple of hours later the biofuel logo was still there, but the apple, which had started life as a 30mm thumbnail, was now almost a metre across. It was a no-brainer.

One week later the 675 was back outside the workshop, spotlessly clean and looking, it seemed to me, better than any other bike I could remember. Paul felt he'd had to rush the job a bit – he'd wanted to do the wheels white with green rim stripes – but with a minibus full of students booked for the top speed run (easier said than done) we couldn't give him any more time. And anyway the quality of finish, right down to the airbrushed logos, was immaculate.

Our dyno run last month had shown that the 675 would run straight into the rev limiter at 155mph. A tooth less at the rear might see it touch 160. With a strong tailwind maybe we could drop two teeth and get a really stupid speed. My plan was to work

it out on the day using E85 (the bio-ethanol you can buy in some Morrisons forecourts), then switch to the 'special stuff'. I drove to the filling station in Wellingborough (again), ordered up 46 and 45 tooth rears from Mark at B&C Express, made a slight adjustment to the rear preload and sat down with a nice cup of tea. This time tomorrow, I mused, I will hold the world speed record for home-brewed fuel.

Then the phone rang. It was the office. 'You blithering imbecile. Mark at BSD has been trying to ring you all day. You were supposed to bring the bike in to fit the fuel map switch, so you can swap between E85 and apple fuel.'

Oh poo. I had forgotten something important.

It was 3pm. Frantic dialling ensued. Mark was snowed under with work, but explained that if I could find a laptop PC I could remap the bike at the track using Dynojet's software. And yes, he would spend five minutes showing me how to do it. All the same, it didn't sound good. I can hardly turn a PC on.

As if by magic, my neighbour Terri strolled round. 'Terri, you have to help me. I need your laptop for 24 hours.'

'OK, but calm down. Nothing's that important.' Cheers, mate.

It turned out that Mark's apple fuel remap really was quick and dirty: as per E85, but with 14 extra increments of fuel injected on 100% throttle above 3500rpm. 'I don't know boy,' he said, as he showed me. 'Maybe I overdid it a bit. I'd be inclined to go up a bit less than that – say ten extra. Try that first, and see how you go.'

Bruntingthorpe has a 10,000ft runway, and a lap is more than four miles, but once you start hacking round at serious speed it all gets a bit compressed. On E85, with a faint-to-non-existent tailwind, the 46-tooth rear sprocket was spot-on – 168mph on the speedo in little more than a mile, just a couple of hundred rpm before the rev limiter. According to our dyno run last month both fuels made 111bhp. So with a swift remap to compensate for the 12% water in our home brew, we should manage the same speed.

Bang on time the students arrived, and set up camp halfway down the runway. I ran the tank to within a sniff of empty, and suddenly the sacred moment had arrived. Neil Tandy (the extrovert of the group) poured all 1.5 litres in, while Tom Laxton reprogrammed the Power Commander. If the fuel consumption on the E85 laps was anything to go by (11mpg according to the onboard fuel meter), we had enough for two runs.

I crept away at low revs, potted up to the top of the runway and gassed it. It felt very strange to be hosing fuel away after so

'The bike was already flat out by the halfway mark. The speedo flickered between 155 and 156, but even sitting up off the seat wouldn't make it go faster...'

FROM PLAIN BLACK TO THIS TO THIS...

A top-quality, one-off paint job like this is at least £1500 and would normally take a lot longer than a week. But Paul at Altamura did it for free – partly for the publicity, but mainly because the idea of Project Fast Fruit appealed to him. 'I like the fact that it's about producing less carbon,' he said. 'We use solvent paints, but we're moving towards water-based. We recycle our metal, cardboard and paper, and we refinish lightly-damaged bodywork and chassis parts rather than replace them.' But the real clincher was having school children involved in the design. 'I thought it was a great logo. It's nice to take what Jess has done, simplify it a bit, and express it on a bike.' As it happens, Paul used to work in the far east, and has first-hand experience of the bad effects of biofuels. 'I've spent time in Borneo and seen how the palm oil plantations decimate the rainforest,' he says. But he still believes they're worth developing. 'If we don't prove that non-fossil fuels work, how will we ever move towards finding better ways to produce them?' Altamura are on 01276 61650, or www.altamura.co.uk



Bike road tester Bruce Dunn (left) prepares his amazing dancing datalogger to record the progress of Rupert and the 675, hopefully at the same time. The project has generated much media interest; Rupe (right) chats to that there Tiff Needell bloke off the telly. None of this would've been possible – or at least as much fun – without the services and cheery enthusiasm of students from Prince William School in Oundle, Northants (bottom left and right)





Bike's resident dinosaur prepares for a future without fossil fuels



many months of one-drop-a-minute production.

The bike was already flat out by the halfway mark. The speedo flickered between 155mph and 156mph, but even sitting up off the seat wouldn't make it go faster. It was clearly a sniff less powerful than on E85. The true speed, recorded by Bruce Dunn's super-accurate 2D datalogger, was just under 158mph. One run left. I could have tried a remap as Mark suggested, but in the end I just tried even harder to tuck in. The result: 158.7mph, and a virtually empty tank. The dash reckoned it had done 16mpg – helped, I guess, by pootling gently back up the return loop. A rough estimate suggests the 675 was eating 227 apples per mile flat-out, or one every seven and three-quarter feet. And although we hadn't quite cracked 160mph, the grins on the students' faces said it all. I must admit, it was a good moment.

That should have been the end of it, but the following day was the inaugural UK alternative fuels drag race meeting at Santa Pod, and the 675 was invited. Now back on E85 and standard gearing, it looked as if it would cream the assortment of biodiesel trucks and Range Rovers, bioethanol-burning sports cars and a methanol-slurping Lotus Exige.

It did, too – helped along, it must be said, by racer Russ Joyner, whose bio-ethanol-burning Laverda Minitwins racer was also along for the craic. I managed 11 seconds dead, but Russ stunned onlookers with a perfect low-wheelie launch to record a 10.87 second quarter-mile, and a terminal speed of 128.46mph. After

the old Laverda (11.97s), the next fastest vehicle was a 1950s VW Beetle that managed, I kid you not, 12.3 seconds before expiring in fine style while attempting a re-run.

Thus endeth our apple-fuelled project. The Triumph has one more record to set, though: to become the first truly flex-fuel motorcycle in the UK. Once we've got some new injectors and ignition parts, and fitted Dynojet's map switch, we'll be able to produce the first back-to-back comparisons of petrol and bio-ethanol fuelling. Watch this space.

See the top speed run

Local TV report

<http://tinyurl.com/59klru>

Santa Pod report

<http://aeracing.org/2008report.php>

WITHOUT WHOM...

- Prince William School, Oundle for fuel production and graphic design
- Triumph Motorcycles, Hinckley, for the loan of 675 Daytona
- BSD Engineering (bsdmotorcycledevelopments.co.uk) for fuel mapping, dyno curves and advice
- Lotus Engineering (grouplotus.com/engineering) for heavyweight technical advice
- Ian Calvert (inzanelaverda.co.uk) for inspiration and advice
- Russ Joyner for quarter-mile launch technique
- Altamura (altamura.co.uk) for bespoke design and paintwork
- Dynojet UK (dynojet.co.uk) for supply of Power Commander fuel remapping device, plus onboard map-switching equipment