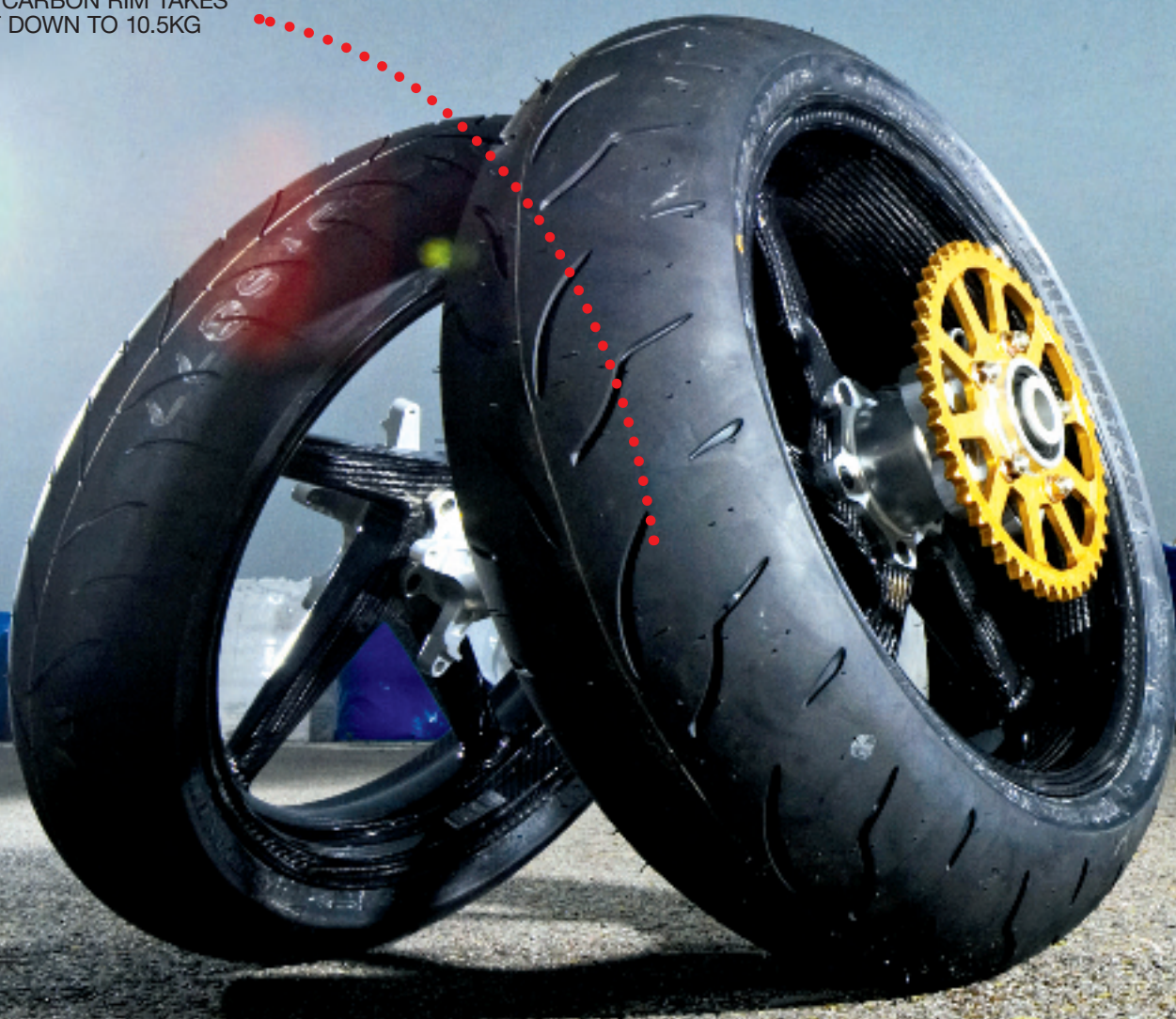


WORDS ALAN SEELEY PICS PAUL BRYANT

DO £2000 CARBON WHEELS REALLY MAKE A DIFFERENCE?

TAKE ONE 07 YAMAHA R1, TWO BST WHEELS AND FIND OUT...

A STOCK R1 REAR WHEEL
AND TYRE WEIGH 14.5KG.
THIS CARBON RIM TAKES
THAT DOWN TO 10.5KG





HOW IT FEELS

Test rider Kev Smith is a lightweight wheel convert.

'From the off the R1 felt heavy on standard wheels – I don't think that was solely down to anticipation of what was to come with the BST carbon wheels.

'Straightaway, the Yamaha felt faster on the carbon wheels. And on the stock wheels under heavy braking the bike felt like it was trying to back in – no such problem on the lighter wheels.

'What I found most staggering was the ability to correct a line mid-turn and that gave me more confidence to lean further even though it was starting to rain. There was far more engaging feedback from the carbon wheels. The Bridgestone BT016s were more than up to it too and in this context there was no need for anything sportier.

'So are the BST wheels worth the money? Well you'd have to throw a lot more cash at an engine to make gains comparable to those being claimed. But the clincher for me is how they make me feel.

'In terms of feedback and confidence I'd definitely want a set of these and if I was racing and the class rules allowed them I'd certainly have to find the money somehow.'

THE COST

£2170 for the BST carbon fibre wheels including all bearings and spacers, cush drive, sprocket carrier and sprocket. HPS 0845 873 8254 www.bikehps.com

With the BST wheels in, we checked over our handiwork to ensure all the fasteners, caliper bolts and so on were tight, then pumped up the brakes before setting off.

Prior to starting the test the subject of suspension settings reared its head, flaring into a debate of bar-room proportions. It was settled by a call to Giles at HPS. He reminded us that it's the upper part of the bike that works on the suspension so there was no need to get involved in issues of compression, rebound and the like.

Giles did say that we might want to play with suspension settings later on, to match them to the changed feel of the bike with the new wheels.

THE TEST

Improved acceleration and braking and quicker steering being the main claims made for lighter wheels, we devised a series of tests – acceleration from 20-120mph and braking from 120mph to 0mph on Bruntingthorpe's long strip, and a number of laps of the shorter handling circuit to allow us to assess the benefits of the wheels through flick-flack turns.

Control tyres were Bridgestone BT016 for both the standard and the carbon wheels and as usual the whole exercise was datalogged. Conditions were cold and damp

and we only just managed to complete the set of runs on the carbon wheels before rain completely stopped play, the airfield's concrete surface beginning to hold water as the test ended. This didn't prevent test-rider Kev Smith, who had been uncharacteristically nervous to start with, reveling in the confidence the BST wheels were giving him. A gleaming new set of gouges appeared in his titanium toesliders – above the previous scuffs – instant proof that he had been much further over than he'd managed on standard wheels.

SO ARE THEY WORTH IT?

Two grand is a big commitment to make for any rider but we're utterly sold on these BST carbon wheels. Any suggestion that they make the bike turn too quickly is fatuous. Isn't that part of what a performance bike is all about? Arguing to the contrary is like saying bike evolution should have stopped before the Honda Fireblade. Advances in materials and manufacturing should mean that lightweight wheels become the standard on all bikes. Stock wheels may be lighter but they still ain't light enough. So, yes these are a lot of money, but they're less money and hassle than engine tuning and the performance gains are similar. 

Your bike Made faster Wheels



Ever since man first sliced off a section of tree trunk and rolled it down a hill he's been trying to make the wheel go faster, better. And for as long as sportsbikes have been around their manufacturers have been trying to pull off the same trick. The pursuit of faster, lighter, better has continued unabated in design offices, even against a backdrop of noise and emissions regulations. But there's one obstacle even the most technically aware and gifted designer can't remove. It's the biggest obstacle to advances in handling and performance – money, and the men who control it.

Bike designers know that much lighter wheels would please you. But cast alloy wheels please the accountants. Forged alloy wheels offer some gains, but the real benefits lie in the use of exotic and expensive materials such as magnesium and carbon fibre. And expensive is anathema to bike manufacturers.

But if weight is so important why do some of the most unlikely bikes have surprisingly good handling? Honda Goldwings and old Suzuki 1200 Bandits are prime examples of big old bloaters that display confidence-inspiring composure on twisty roads.

Their secret is good sprung to unsprung weight ratios. Sprung weight is that part of a bike's mass that rests on the suspension.

The simplest way to understand sprung weight is to take your bike off its stand and sit on it. Everything that moves down on the springs is sprung. The parts that don't – swingarm, fork lowers and the focus of our attentions this month, the wheels, are unsprung. Strictly speaking the portion of the swingarm forward of the shock mounting is sprung rather than unsprung, but you get the idea. Big, heavy bikes have lots of sprung weight in relation to their unsprung weight; a lightweight performance bike has a far lower ratio. When a bike hits a bump, heavy unsprung components have a greater momentum which gives the suspension a harder time. The lower the sprung to unsprung **» » »**

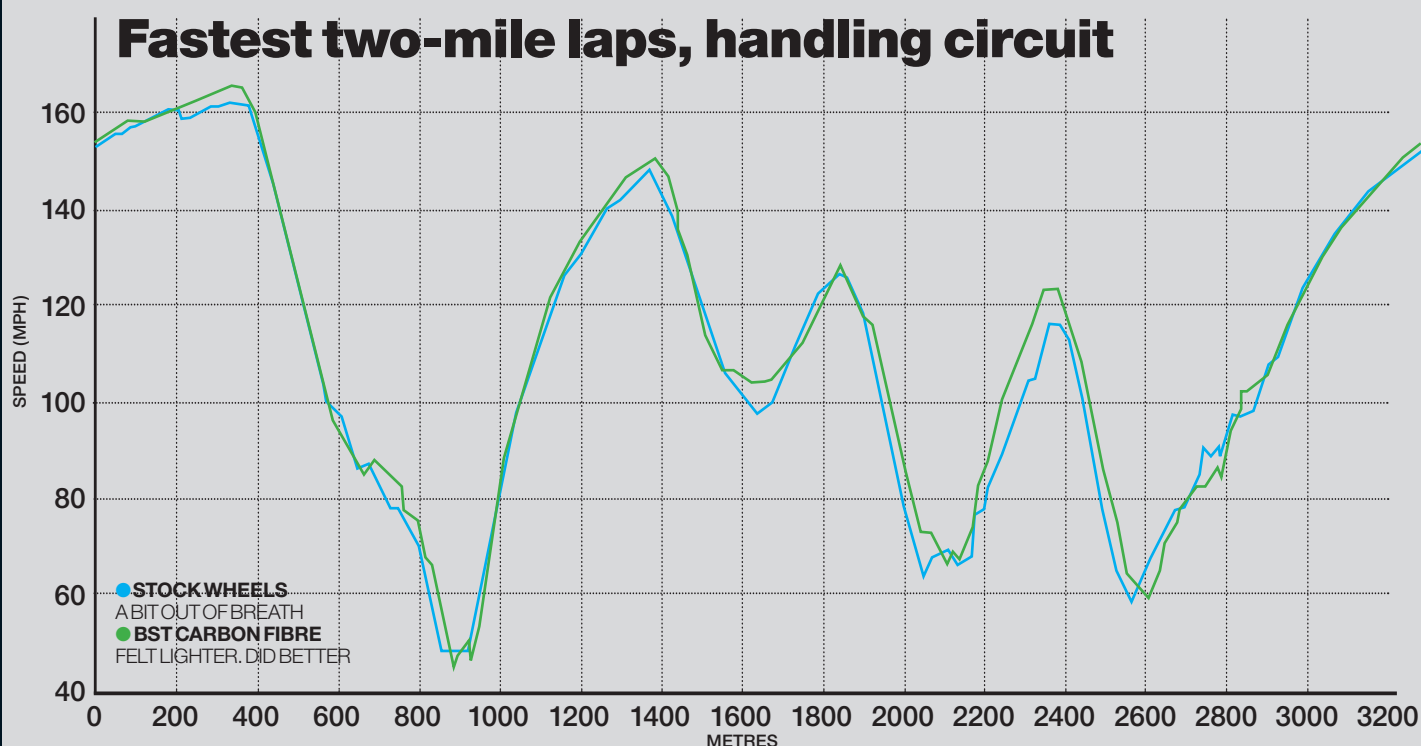




Tester Kev Smith
proves that weight
loss makes you lean

WHAT DIFFERENCE DO WHEELS MAKE?

Fastest two-mile laps, handling circuit





THE FEELGOOD FIBRE. FASTER, LATER ON THE BRAKES. AND CONFIDENCE

The data traces show the fastest laps of our two-mile handling circuit at Bruntingthorpe on stock wheels and on the BST carbon wheels. The advantages of lightweight wheels are obvious. And that's without measuring the feelgood factor – the increased confidence they give the rider.

Our fastest lap on stock wheels was 1:13.3s and on carbon fibre, 1:11.8s, exactly 1.5s over the whole lap. At the fastest point on the main straight the R1 had accelerated to a peak of 165mph, nearly 5mph faster than the stock bike, and it was quickly hauled up for the bumpy right hander at the end of the straight.

We lost time coming out of the right-hander but blame that on not having time to play with the suspension – giving the heavier stock wheels an advantage. But, lightly shod, on the shorter straight and round the fast left-hander that follows, the R1 carried 103mph compared to 97mph on stocks.

Accelerating towards the chicane and arriving much faster with far later braking, the carbon wheels really deliver on their promise. A few more laps of and some suspension tweaks and we reckon there would have been an even more pronounced advantage.

weight ratio, the more stressed the suspension will be and the more compromised the handling. The closer the unsprung figure is to zero, the better.

The other considerations are rotational inertia and gyroscopic effect. The first of these covers both the wheels' resistance to turning from standstill and their unwillingness to be slowed from high speeds. The second describes a wheel's tendency to carry on spinning in the plane it's on, requiring greater input to turn it in a different direction.

THE WHEELS

We chose BlackStone Tek (BST) carbon fibre wheels for our test. Giles Harwood is a founder of HPS, who import them. 'Standard wheels are a lot lighter than they used to be but still don't offer the performance

'WHEN TURNING, THE DIFFERENCE IS THE BIKE WILL GET OVER MORE QUICKLY'

of properly light wheels,' he says. 'A stock front wheel these days is anything from 3.5 to 5kg whereas a BST carbon wheel is around 2.5kg. That makes a big difference to the effort required to turn.'

We weighed the stock wheels against the carbon wheels with tyres but without discs. The stock front weighed 8kg and the BST 7kg. But the difference at the rear was colossal – 14.5kg versus 10.5kg – a saving of nearly 30 per cent. 'The difference there when turning is that the bike will get over a lot more quickly,' says Giles. 'When accelerating it can be like gaining up to 9bhp because less power is sapped by the energy required to turn the wheels. There's obviously less mass to pull up when braking, too. The mass of the wheel is concentrated in the hub to the benefit of rotational inertia. All of that means less rider fatigue, better tyre grip and reduced wear.'

BST's wheels are US made and use a seamless single moulding process. They are also TÜV certified making them suitable for road as well as race use.

THE FITTING

The BlackStone Tek carbon wheels loaned to us by HPS for our 07 R1 are manufactured and supplied to be a direct fit and come with all the necessary bearings and spacers. Messing about in a machine shop is not required.

We had decided to reuse the Yamaha's stock discs and this turned out to be the trickiest part of the operation. The disc bolts have Torx heads – still something of a rare sight on Japanese bikes – and it was only the presence of a set of never-used Torx bits in our Halfords Professional ratchet spanner set that saved the day at Bruntingthorpe.

Remember that the disc bolts are Loctited in; and have to be Loctited back in if being reused. This can make removal challenging, so stand by with an impact driver and a heat gun should any of them prove

stubborn. They're easiest loosened while the wheels are still in the bike.

If reusing discs, ensure that any corrosion is removed from their mating surfaces with the hubs. This is a major contributor to warped discs and often arises when people fit new discs to old wheels – the corrosion being on the hubs in this case. You're best off with new disc bolts, too. The metal in the stock bolts is crap and they do tend to round off and stretch with reuse.

In an ideal world we'd have had the new wheels balanced once the discs were on, but time being against us we'd only had the tyres fitted to them before we dragged the bike off to Bruntingthorpe.

This meant putting up with a brief but noticeable patch of judder on deceleration – emphasising the importance of wheel balancing. 🐘 🐘 🐘



JOHN NOBLE

Turn to p31 for details of these BST wheels