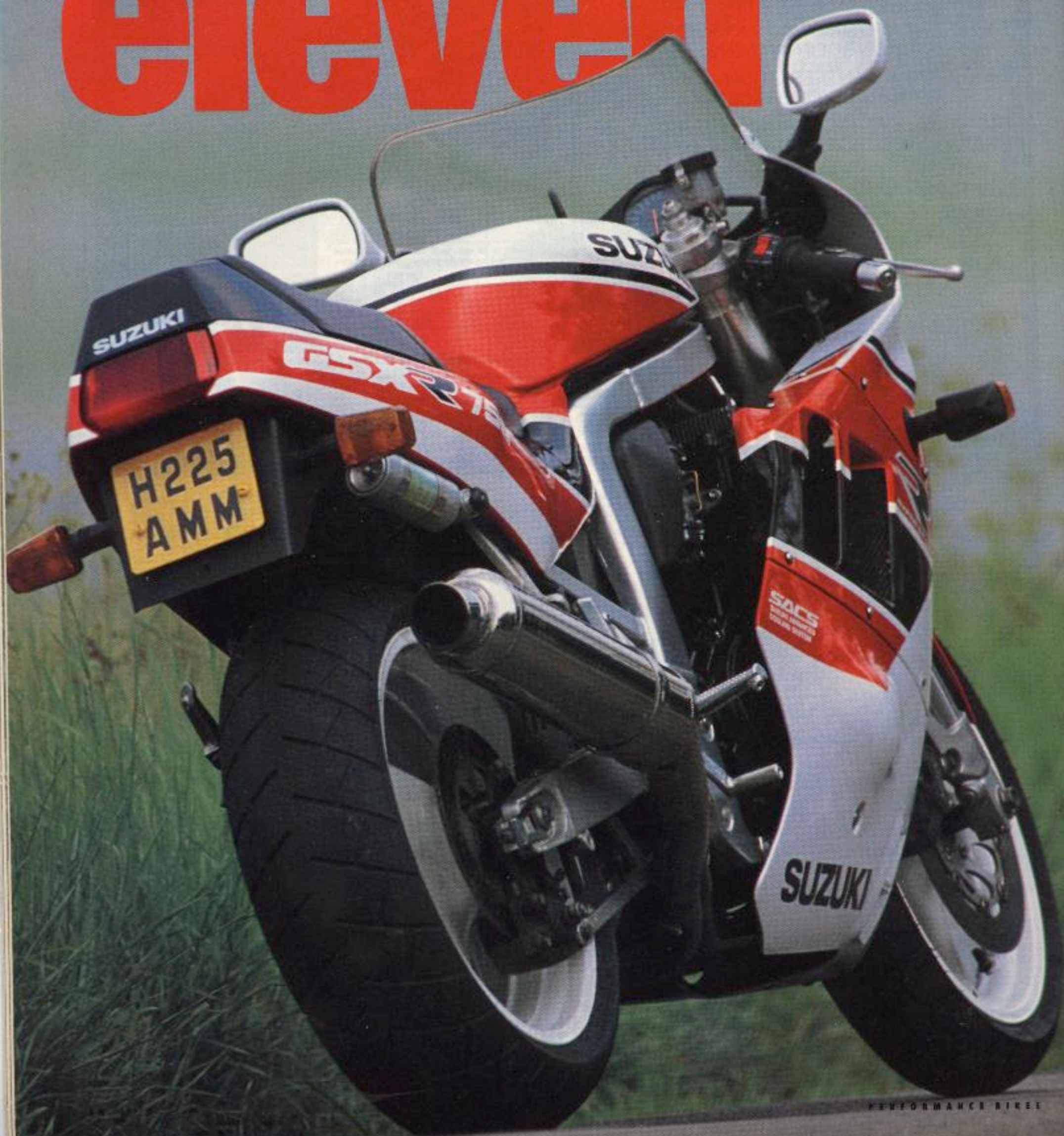


Seven eleven

More torque than a ZZ-R, less weight than a GSX-R. Putting 1100cc on a 750 wheelbase proves there's no such thing as a free launch.





Left: not much to give the game away except a slightly strange silencer and the fact that the bike leaps out of your hands coming out of corners without even being asked. With enough torque to pull a Brontosaurus out of quicksand stuffed into a GSX-R750 chassis this is one of the barkiest bikes we've ridden.

Bradley wanted one. The best he came up with was a GSX1100FJ engine (you remember, those Neanderthal things with electric windscreens which can be raised and lowered) whose engine numbers had also been raised and lowered. The longest chapter of the whole episode was establishing that it was a stolen-recovered unit which the breaker had acquired legitimately from the insurance company. You'd think insurers and breakers would issue and keep receipts when they were dealing with stolen-recovered vehicles. Maybe their customers aren't usually so fussy as Bradley.

The main differences between the GSX and the GSX-R are the cams, 34mm carbs, and exhaust, i.e. a generally softer state of tune, with peak torque down at 7,000rpm and a symmetrical spread either side of it. Even in fully encumbered form, it actually gives considerably more torque than the ZZ-R and the power tails off at about 118bhp, giving quite respectable performance despite the 553lb dry weight.

In completely standard form the GSX will top 160mph and run quarter miles in 11 seconds (full test Dec '91).

On Suzuki's standard gearing it puts a chain-stretching 920lb of thrust down between tyre and road. I think this is the

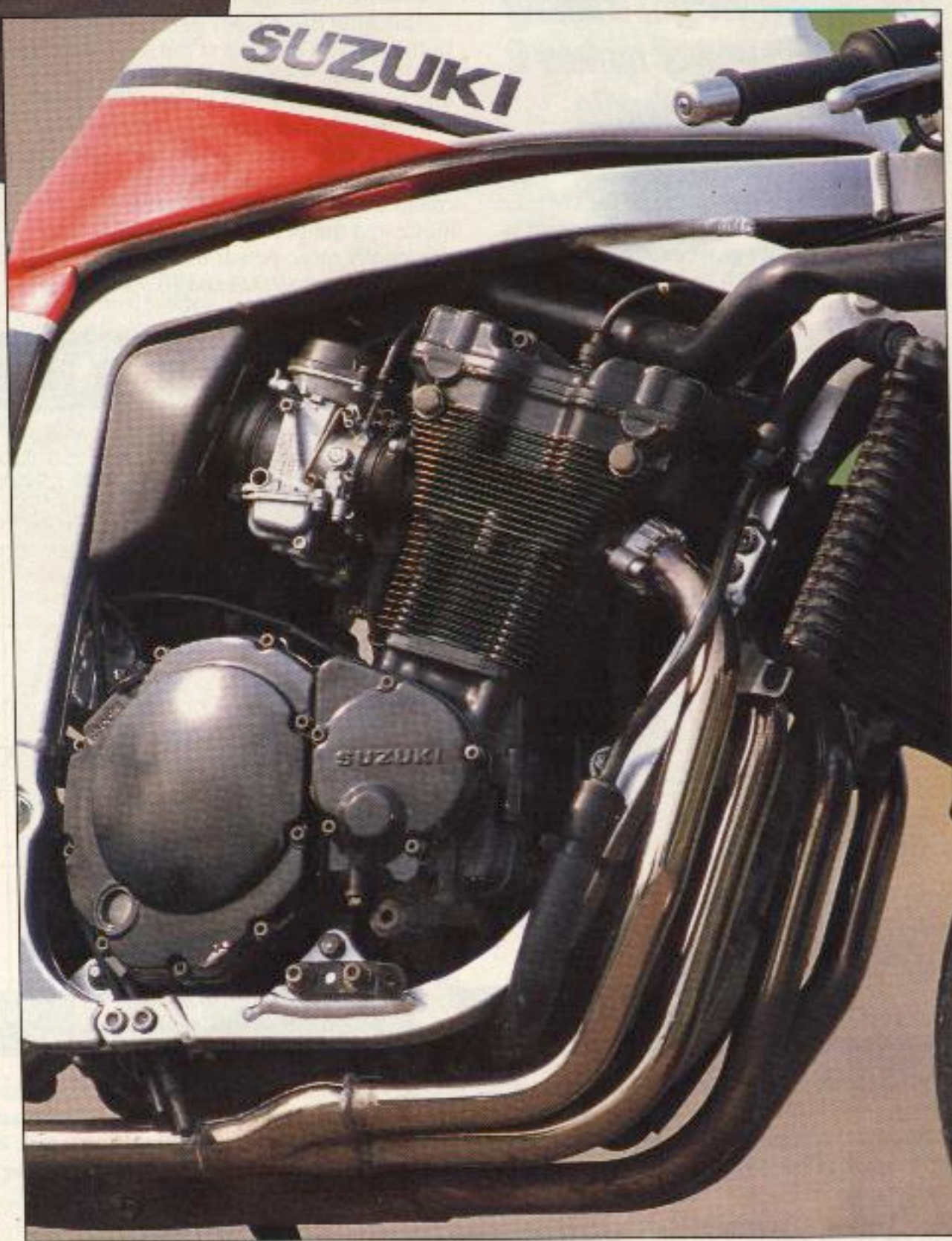
Bradley had a GSX-R750L, which was very nice until one day, when he inadvertently had a go on a ZZ-R1100. This altered his view of the world in general, and his 750 in particular.

In short, he wanted a ZZ-R. This is a thing with which we can sympathize because there is something hypnotic about the power delivery and the way the intakes growl under the fuel tank, like a box full of terriers approaching resonance. I had witnessed the effect it had on the normally staid and gentle M Forsyth. Even I had had to exert the full extent of my self-control when it was my turn to ride it. Mad old buggers like Mat Oxley had to be blinkered every time they went past a Kawasaki shop.

But Bradley* was a bit fussier than us, on the grounds that he planned to pay for it himself. What he craved was the ZZ-R's power and power-to-weight ratio. Its ride, handling and total weight were not as good as his Suzuki's. And the £3,000-odd it would cost to trade in the 750 for a new ZZ-R put a slightly spottier complexion on the hypnotist's face.

Some thought and a few rough comparisons suggested that the 1100 Suzuki motor would fit — which it did, embarrassingly easily — and, after all the buying of the new bits and the selling of the old the net cost, including advertising, was a piffling £300.

Physically fitting the engine was about the easiest bit; the most difficult was finding a straight engine in the right price bracket. You would have thought that the breaking world would be up to its gills in usable GSX-R motors. Not so. Or not when



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most we have ever measured on a stock bike; certainly it's more than the FJ-king-of-torque-1200 (which manages about 870lb) or the ZZ-R (a weedy 840lb). The GSX-F, despite its weight and its front-end bias, will still wheelie off the throttle.

	GSX-7/11	ZZ-R1100
Max power	124bhp @ 9,100rpm	123bhp @ 11,000rpm
Max torque	79ft-lb @ 7,000rpm	69ft-lb @ 7,800rpm
Fuel consumption	40mpg	38-51mpg

Now imagine liberating 124bhp, with 36mm Slingshot carbs and a Motad Slingshot exhaust, and dropping this into a 750 frame so that it all weighs 530lb wet and ready to rock. It may not have the Kawasaki's hypnotic growl, but it has a very persuasive line of chatter.

It's short for an 1100 and the violent weight transfer under full power makes it difficult to handle

It also has very practical power characteristics for the nature of the bike, i.e. full road use, including 10.7-second quarter miles with 14-tooth gearbox sprocket, 162mph with 15-tooth sprocket and



wheelies in the first three gears. "You've got to be careful. Sometimes, when you're coming out of a roundabout, it'll just lift the front wheel up, with no warning or anything." What Bradley was trying not to say was that it could equally easily slide the back wheel out and, on one or two glorious occasions, both.

Matching the ZZ-R's performance was both easy and difficult at the same time. In the July issue we ran a piece about dynos and horsepower which included a minor rant about how it was easier to extract performance from high-revving engines and that low-down torque wasn't all it was cracked up to be. The GSX-R7/11 illustrated the point exactly. It had marginally more power than the ZZ-R but it did it between 9,000 and 10,000, while the

Kawasaki peaked between 10,000 and 11,500rpm. The Suzuki actually had quite a lot more torque, also at lower revs.

With its lighter chassis, Bradley's bike obviously had the capacity to outrun the ZZ-R under pretty well any circumstances from 0-60 times through to balls-out top speed.

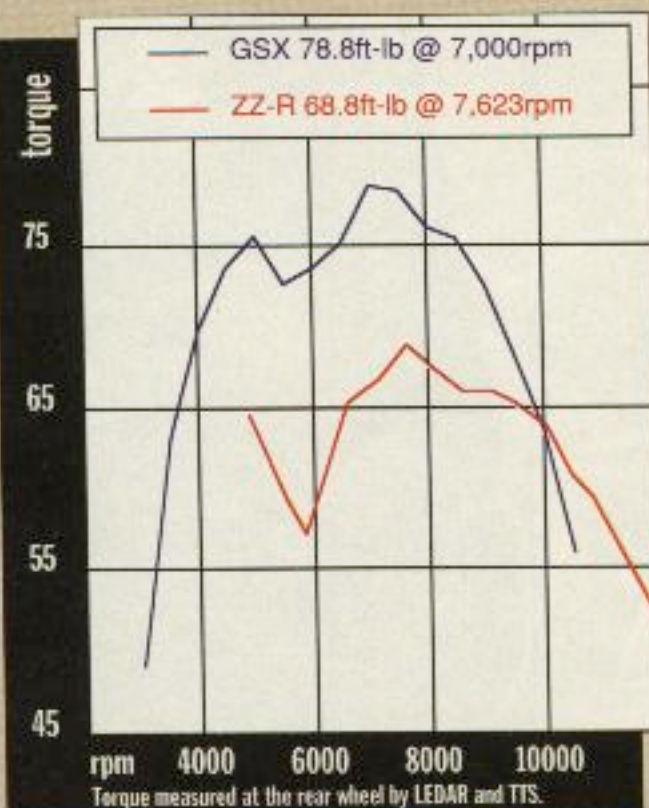
It did, in fact, run a better quarter-mile time with Bradley riding, at Santa Pod. This was with a 14-tooth gearbox sprocket which was still fitted when the bike was run on TTS's Dynojet rolling road dyno — a useful feature of which is that you can see the roller speed in mph and thus draw conclusions about tyre radius and gearing. The 7/11 bumped into the rev limiter at about 155mph in top.

This was well beyond peak power anyway, so we raised the gearing to a 15-tooth sprocket before going to Bruntingthorpe. This would give a bit over 10mph more at the same revs.... The bike actually ran to 162mph — again, well past peak power. Raising the gearing further would probably give us the same top end as the Kawasaki's 173mph (although I suspect that Kawasaki's aerodynamics are better than Suzuki's and it might not be as easy as all that). Even so, the acceleration was already beginning to suffer and raising the gearing further would have taken us out of the 10-second bracket.

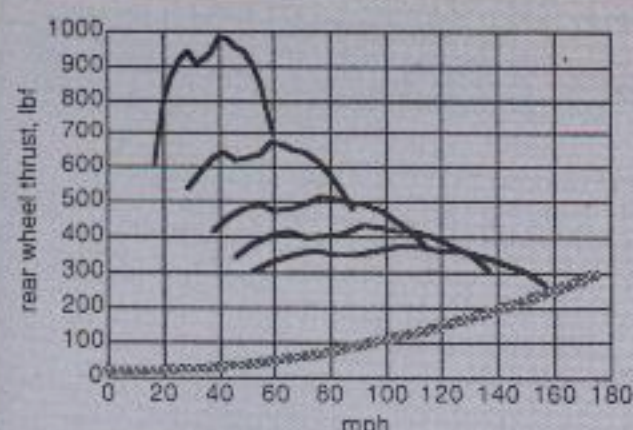
The Suzuki had the potential to beat the ZZ-R on both top speed and quarter mile times, but it needed a careful change of gearing in between.

There was one other aspect, which was good on the road or a race track but not so good for standing start acceleration. The 7/11's performance came from a healthy power-to-weight ratio and this lack of weight partly comes from a lack of bike. It is short for an 1100 and the violent weight transfer under full power was making it difficult to handle. Between acute wheelies and

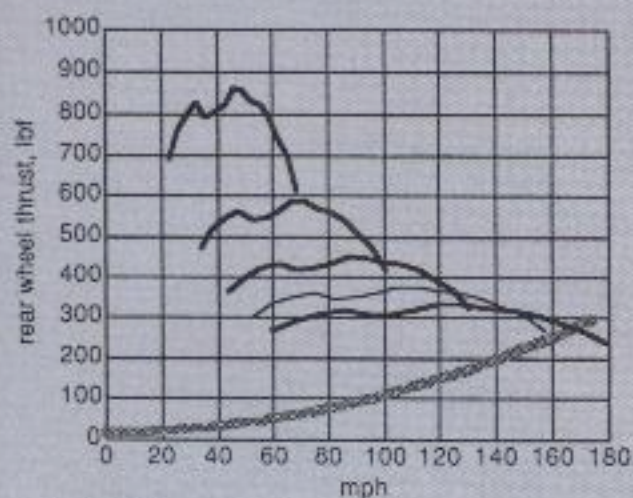
PERFORMANCE



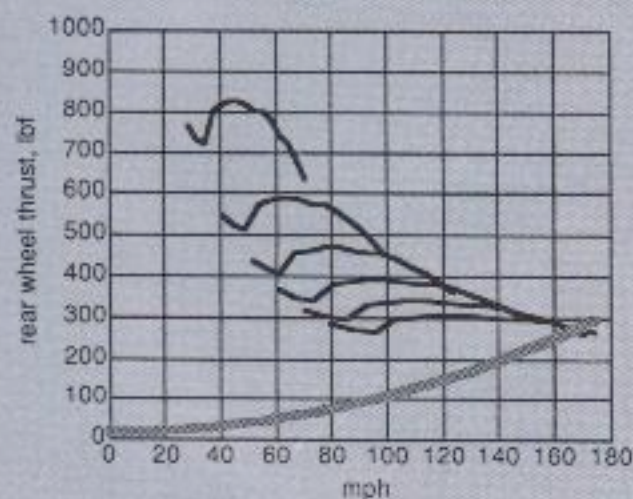
The massive torque from the GSX unit literally dwarfs the mighty ZZ-R. As Bradley's bike also has less weight to push along, you'd think it would stomp all over the Kawasaki. It does, in top-gear roll-ons and drive out of midrange corners. But the shape of the Kawasaki's power delivery, spread across higher engine speeds, makes it easier to get at. And the better balance of the bike, despite the weight penalty, also makes it easier to use. Thus the ZZ-R is less sensitive to gearing, less prone to wheelie/wheelspin, no worse than the Suzuki on top speed and only marginally slower on standing-start acceleration.



This is what Brad's bike does, through the gears, to the tarmac under the back wheel. Firstly with 48/14 sprockets (top speed in 45 seconds)...



...then with 48/16 sprockets (top speed in 51 seconds)...



...and this is what a standard ZZ-R1100 manages.

The GSX with 48/14 gearing (top left) was about at its optimum for acceleration and impromptu wheelies. In bottom gear it puts down a colossal force: almost 1,000lb of thrust at the tyre. It also runs into the rev limiter at about 155mph. The shape of the torque curve coupled with the spacing of the gears makes 4th virtually redundant — between 110 and 120mph it gives marginally more thrust than going straight into top.

The 48/16 gearing (mid left) is the optimum for top speed, with something approaching 170mph. The reduction in maximum thrust is already apparent and 4th is still redundant (shown as a thinner line so that you can see it at all). What might be better is to do what Kawasaki do with six gears — use lower 1st, 2nd and 3rd ratios to get acceleration, and stretch 4th, 5th and 6th to get the benefits of tall gearing for top speed. That's how Kawasaki manage to match the Suzuki's performance, using less torque and a heavier bike. If you compare the maximum thrust available at 60, 80 100mph, etc, you'll see that the ZZ-R can equal the Suzuki on both its low and its high gearing. Bradley's got a 15-tooth sprocket.

chronic wheelspin, there were perfect, glorious launches. You'd need practice, skill and then you'd be lucky to get it right more than once out of three or four runs with times scattered anywhere between 10.6 and 11.3 seconds. On the better-balanced ZZ-R we usually get every run below 10.9 and none of them vary by more than a tenth.

On the road, of course, top gear performance was easily better than the ZZ-R; when you've got more force and less mass for it to push along, you must have better response and better acceleration. Allowing for the notion that the GSX-R has fantastic ride and handling when the suspension is right, this machine is capable of corrupting even solid God-fearers like me.

John Robinson

*We have met Bradley before. He had a P&M Kawasaki special powered by a Jim Wells, ex-factory, FI engine with twin plug heads and many horsepower (Nov '86); he was part of the team who designed and built our infra-red timing equipment; he also had a GSX-R1100K which he lent us in an attempt to find out why they didn't handle (Aug '89).

Computed performance comparison with ZZ-R (with measured speeds in brackets, where available)

	GSX (48/14)	GSX (48/15)	GSX (48/16)	ZZ-R1100
Max speed	157 (156)	161 (162)	166	173 (173)
0-60mph	3.31	3.38	3.4	3.34
0-100mph	6.1	6.1	6.2	6.1
¼ mile	7.2 (6.9)	7.3	7.3	7.3
@ speed	111 (106.4)	111	111	112
½ mile	10.73 (10.69)	10.85	10.9	10.8 (10.8)
@ speed	134 (128)	134	134	135

Left: after spilling a motorbike on his leg John has spent the last month at home. By night he trains lobsters to live in a fish tank filled with Charlies. By day he teaches his computer to predict performance figures for outrageously modified motorbikes.

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GSX-FACTS

Most of the big engines beginning with GSX seem to share certain similarities of crankcase casting. Thus the 1100F drops straight into the GSX-R750 engine mounts. The problems start where components straddle the old frame and the new engine (or, if you prefer, the new frame and the old engine — someone out there has a 750-powered GSX-F weighing a quarter of a ton but with a very cute windscreen).

The exhaust is the most obvious problem area. It has to work with the engine, yet it has to fit the frame. The Motad 4-2-1 system works well (Bradley's motor gives more power than the stock version) and, with a modified mounting, it fits reasonably with no cornering clearance problems.

If I were to be critical I would say the secondary pipes don't quite follow the line of the chassis, and the tail of the exhaust is a bit droopy. Worst of all, one header pipe touches the left-side bellypan, so Bradley has some more chopping to do.

Similarly, the fuel system, somewhere, has to match both donor machines. Bradley chose 36mm CV carbs and the airbox from the Slingshot. The tank then has the fuel tap in the wrong place and either has to be jacked up by $\frac{1}{2}$ inch or swapped for an 1100 tank. To improve the throttle response, Bradley drilled two 3mm holes in the piston air slides.

Other points where the two machines clashed were at the oil cooler (whose pipes had to be bent to clear the exhaust pipes and prevent it from becoming an oil heater), the control wires and gearing.

If you've ever built a special you'll know that this is the really difficult bit — all those finishing touches that go unnoticed when they're right but completely ruin a bike when they're the slightest bit out. They can also cost a fortune, even at breakers', if you have to buy them separately. Bradley was ready for this and while he was paying big money for the motor he negotiated most of the other bits like hoses, clips, igniter boxes and so on.

The fairing side panels had to be trimmed away to clear the camboxes and the main side mounting, that goes into the cylinder head, no longer exists. This lets the fairing sides flap a little so it'll need another bracket making. Bradley also modified the footrest brackets, shortened the steering damper bracket and used the 750 earth lead.



Part	Source	Cost £
● Rolling chassis	existing GSX-R750L	—
● 750 engine, exhaust, carbs, airbox, ignition	sold	- 800.00
● GSX1100F engine, ignition, oil cooler pipes, clutch master cylinder, clutch lever, 36mm Slingshot carbs, airbox, hoses, L cush drive	breaker	800.00
● GSX-R1100 Motad exhaust	new	235.00
● Footrest plates, steering damper bracket, exhaust mounting, oil cooler pipes, fairing, tank mounting	modified	—
● GSX-R1100 right rear footrest plate	breaker	15.00
● Oil, filter, gaskets	new	30.00
● 15T gearbox sprocket	new	6.00
● Advert	—	15.00
Total cost		£301.00