

Road test TTS Hayabusa

► Supercharged Hayabusa from TTS
► 283bhp and 168ftlb ► £5000 for 62%
power increase ► Retains original
machine's excellent tractability



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ROAD TEST

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Suzuki's 195bhp Hayabusa has never been a wallflower. But compared to this latest supercharged example, which has been built by tuning experts TTS of Silverstone and puts out a massive 283bhp with no loss of usability, it certainly feels like one.

Richard Albans is the man behind the Northants-based tuning shop and has long been convinced that supercharging is the way forward for cheap, reliable power (see page 24 for more analysis). His new Hayabusa has been built to showcase TTS's latest wares.

It uses the latest Rotrex supercharger which is considerably more compact, lighter and able to deal with the engine speeds of more motorcycles than previous examples. While TTS has also redesigned the charger mounting systems to make them tidier. CNC-machined external mounting cases, plenum chamber and pre-formed air ducts, meanwhile, are works of art, which means not much bodywork has to be removed and only minor exhaust pipe rerouting is required, if at all on some models.

Supercharger is easy to fit

All of which means the whole shebang is now sold as a kit that anyone can fit. The only sticking point is the bike's fuelling/ignition will need to be re-mapped to boost fuel input to match the increase in pressurised air charge fed into the throttle bodies (see: How it works, right). But as Albans says: "Any dyno tuner worth his salt will have the equipment to do this."

The 2008-onwards Busa also features an increased compression ratio of 12.5:1, meaning less boost

pressure is required from the latest C30 Rotrex supercharger to net a high level of performance from the engine.

Even so, it's still kicking out 280bhp and 165ftlb of torque at 11,000rpm – a higher than normal increase to sate Albans' thirst for drag racing. It also necessitates an aftermarket fuel additive to avoid detonation. Not that this matters when dealt with the sort of drive that could spin the earth the opposite way.

Wheel goes skywards...

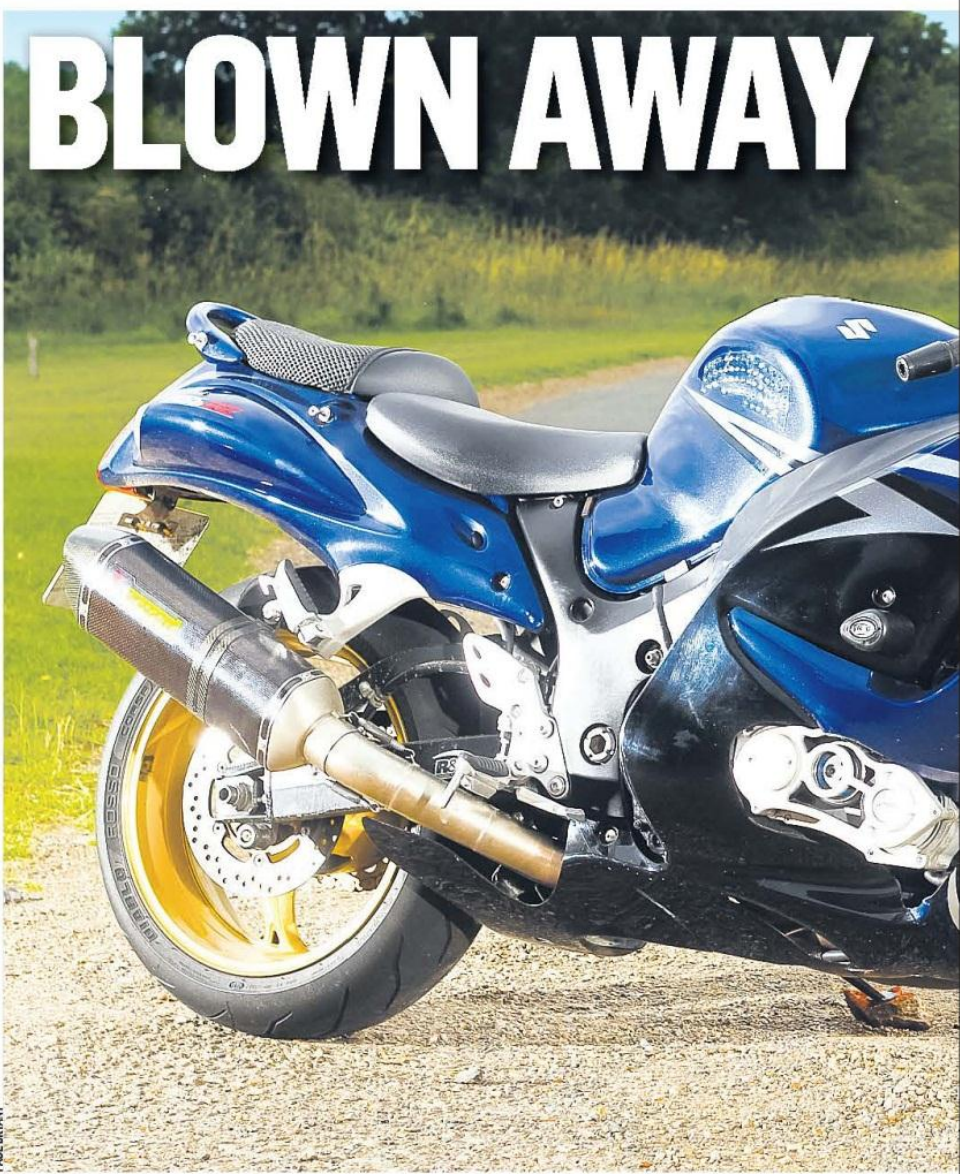
So what's it like? Well, with a fistful of throttle in first gear and the tachometer hovering around the 5000rpm mark the front wheel simply went skyward. A hurried shut off left me with bruised nadders and wondering if the front tyre had blown off the rim because of the

With a fistful of throttle in first gear and the tachometer hovering around 5000rpm the front went skywards

MCN'S TREVOR FRANKLIN

savage way it went from vertical back to horizontal.

Thing is, there was no real warning. Up to that point the Hayabusa had been an everyday 180bhp pussy with only a subdued growl from the Akrapovic silencer. Normal riding hadn't suggested hell could be unleashed in an instant.



PAUL BRYANT



MCN's Trevor Franklin on the TTS Hayabusa. The foam next to the crash bung is the supercharger air intake

BLOWN AWAY

So I tried again. And again the front wheel went vertical. Third gear... exactly the same, but at 130mph this was bordering on the insane. No wonder Albans had to bolt 10kg of dead weight to the front wheel spindle at a recent drag event and even then he struggled to keep the wheel down...

In short: normal throttle abuse anywhere in the rev range causes massive forward momentum, yet it happens so, so smoothly the bike feels stock. Not until you look in the mirrors and find no trace of the car you've just overtaken do you comprehend how devastatingly beautiful a supercharged motorcycle is.

Supercharging by stealth...

With only an air filter for the inlet side of the supercharger poking out through the left side of the fairing and the external mounting case for the drivebelt on the lower right, there's little that shouts 'warning, supercharger fitted'. It is indeed a subdued affair that catches out the unwary sports bike. Or Porsche.

What's more, apart from the occa-

Even with 10kg bolted on, the front was still in the air as I crossed the line

TTS'S RICHARD ALBANS



We race KTM's out-of-the-box racer at Oliver's Mount
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Real wolf in sheep's clothing... the kit is so neat the bike looks almost standard



TTS plenum chamber – a normal airbox would be blown apart



Air is filtered before it enters the TTS Hayabusa's supercharger

WHAT IS A SUPERCHARGER?

A bolt-on device that forces air by means of a high-speed impellor into the inlet manifolds at greater pressure than a normal air inlet and airbox system will allow. This 'boosted' air charge, together with increased petrol delivery, results in a bigger bang in the cylinder. More bang equates to more power. More power results in more heat

produced and the more power produced may necessitate the need for an intercooler to cool the incoming charge of compressed air, plus a separate oil cooler for the supercharger itself. A supercharger does the same job as a turbo but works by being driven by the crankshaft, whereas a turbocharger is a turbine driven by exhaust gasses.



Drivebelt takes power from the crank to spin the supercharger

HOW IT WORKS

A supercharger has an air inlet and outlet, and between them an impellor, gearbox and oil pump. The impellor is driven by a pulley wheel, in turn driven by the end of the rotating crankshaft. A ribbed polymer belt connects the two. The crankshaft pulley is supported by a bearing inset in a TTS designed and built external casing that cleverly mounts the original starter motor.

With both pulleys identical in size to give a ratio of 1:1, even if the engine revved to 12,000rpm it wouldn't be enough to pressurise (boost) the air needed to produce any additional power to talk of. An internal gearbox within the supercharger spins the impellor at a higher speed. This gearbox ratio is approximately 10:1. So every revolution of the crank means the impellor's shaft spins 10 times. That means an engine speed of 10,000rpm spins the impellor at 100,000rpm! The impellor is mounted within bearings and an oil pump ensures they are lubricated and kept cool.

Incoming air, via a filter, enters



For every 10,000rpm at the crank the impellor spins 100,000 times

the supercharger through the inlet side, gets compressed by the impellor and forced through to the outlet. This outlet is connected by aluminium tubing to a plenum chamber (a replacement airbox)

that acts as a reservoir for the boosted (pressurised) air. A pre-set blow-off valve can be incorporated into the outlet side to prevent excessive boost when changing gear.

sional adjustment to belt tension, the supercharger system is virtually fool-proof, too.

And unlike a turbo doesn't suffer any lag because it spins constantly in time with the crankshaft – this also means the supercharger starts to boost the moment the engine revs rise.

May seriously hurt licence

For me at least, the only detrimental aspects of supercharging are to the health of your licence and the initial outlay for the system. In kit form, the MkII system retails at £4200. A ride in, install and set up service will hit the bank for £5000. Still, maybe that's a worthwhile price for the amount of fun that's given...

■ The application list of TTS supercharger kits is growing. For more information visit: www.rotrexsuperchargers.co.uk

THE FACTS

TTS SUPERCHARGED SUZUKI GSX1300R HAYABUSA

Engine: 1340cc (81 x 65mm) liquid-cooled in-line four-cylinder, 6-speed gearbox, Belt final drive, TTS/Rotrex Supercharger

Chassis: Aluminium dual-beam frame, aluminium swingarm

Rake/trail: 23°/97mm

Dry weight: 222kg

Fuel capacity: 21 litres

Suspension: Fully-adjustable USD forks, fully-adjustable monoshock rear

Brakes/tyres: Dual 320mm front discs with 6-piston callipers, 260mm rear disc with 4-piston caliper, 120/70 x 17in front, 190/50 x 17 rear.

Info: www.rotrexsuperchargers.co.uk (01327-858212)

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