



# STACKING it up!

A new suspension upgrade for the Series 2 TT is designed to provide hot handling *and* reasonable ride quality. **Neil Birkitt** reports.

YOU'D IMAGINE that, after all these years, all the options for suspension upgrades would have been pretty well explored. There are certainly a great many different suspension kits of some make or other, with everything from simple sets of lowering springs, right up to complex coilover kits which provide a wide range of ride height and damping rate adjustments, not to mention sophisticated air suspension kits...

But then someone comes along with a variation on the theme that is well worth taking notice of. At this year's GTI International, on the Eibach display, we met TT RS owner William Blankson who has spent several years carrying out some interesting development work on a bespoke suspension set-up for his car. So successful have been the results that he is now promoting it commercially under the brand name MSS and there have already been several satisfied customers, judging from the feedback on his website.

William, 43 this year, was born in Ghana and grew up in South London,

qualifying as an IT engineer before setting up a project management company specialising in IT infrastructure project delivery for corporate clients based in UK and Europe. Like many IT people, he has owned a number of high-performance prestige models and is a motorsport enthusiast with a strong interest in engineering.

It was while exploring the options for improving the handling of his TT RS that William decided to think outside of the box. Equipped as standard with the magnetic ride function, which adjusts the damping rate between sport and comfort modes, William still didn't feel that the standard suspension provided the right characteristics. Comfort wasn't actually comfortable, and sport was too severe for road use. Rather than being the best of both worlds, it seemed to satisfy neither,

but William was sure that something could be done about it, without dispensing with the magnetic ride function altogether as happens with so many suspension upgrades.

It was while researching the options that William came across Paul O'Neil, who wrote about his theory about using stacked springs on active dampers on the Porsche forum, Rennlist. Paul now owns a 997 GT3, but had previously owned a modified Audi S4 that was equipped with an Ohlin suspension kit and his experience convinced him that ride comfort could be coupled with track capability.

William and Paul both agreed to try it out on the TT RS and William first contacted the BWI Group, the manufacturers of the MagneRide system used by Audi on the TT, for some help understanding how the magnetically-

**'William didn't feel that the standard suspension provided the right characteristics, but was sure that something could be done about it...'**



controlled dampers worked in dynamic terms.

William's next contact was with Greg Kirby, the MD of Eibach here in the UK, and Paul Jones, of the aftermarket sales department at Eibach. Paul is also an avid motorsports enthusiast and proved to be instrumental in further developing the idea of using stacked springs in conjunction with active dampers.

In principle, the idea is simple enough; instead of a single spring, you use two springs, one sitting on top of the other and coupled by a flanged collar, each with different spring rates, to provide different characteristics as the suspension loads up.

William explains the way it works by likening the MSS spring kit to a car audio speaker system, with tweeters to handle high frequencies, mid-woofers to handle mid-range frequencies and sub-woofers to handle bass that can be felt. Each component speaker is designed to operate at its optimum within a certain frequency range.

With the MSS suspension kit, the low rated spring acts as the 'tweeter' to deal with the smallest road bumps, while the middle rated spring acts as the 'mid-woofer' handling and soaking up medium road bumps, and the combination of the

two provides a heavy-duty rated spring to act as the 'subwoofer', handling and soaking up the largest road bumps.

Clearly, though, the permutations of spring rates are numerous and it took a lot of design consideration as well as testing to come up with the best overall combination, while at the same time also taking into account the operation of the standard magnetic dampers.

William comments, 'Paul Jones assisted greatly in helping us understand the range of Eibach ERS springs and choosing which sets would work best. It was a long, drawn-out exercise of trial and error, with loads and tolerances to be taken into consideration but, over a period of two years, Paul and I worked with Eibach and others to refine the concept by way of endless mathematical calculations. It was no small feat and we will forever be grateful to Paul for his initial and continued involvement in the background, playing the devil's advocate on all the products we develop'.

When it came to the installation and testing, William teamed up with Jim Mew of JKM Performance in Portsmouth. As well as being a top-notch technician, Jim is also a very skillful driver – one of those who can not only pilot the car very effectively but also understand what is

going on in terms of its handling, analysing and interpreting the effects of any changes that are made.

By this time, William had already had a lot of interest in his proposed conversion from enthusiasts in the USA, and before releasing the kit to market he also established a team of testers, headed by Craig Moore the chief engineer for the Dan Istook race team, along with several other enthusiasts with a long history of modified cars – Jeff Guzman, David Ashpole, Cliff Roman and Lake Setzler. In particular, Lake was attracted to the idea of the MSS kit because he wanted a suspension set-up suitable for all-out track use for his TTS, while still retaining the magnetic ride control for road use.

Of course, even the added versatility of the stacked springs and magnetic dampers can't provide a total solution to the wide-ranging demands for an uprated suspension set-up and so MSS now offers two kits; a Sports kit for road use with trackday capability, and a Track Pack for full-time trackday cars.

The Sports kit uses a high-performance front spring, which reduces the ride height by 15 mm, in combination with a stacked rear spring arrangement with a threaded perch which is adjustable by 20 mm. The



**'The nett result is a substantially improved overall handling performance, with civilised ride quality, and full function of the Magneride system...'**



Track Pack is height-adjustable by 20 mm both front and rear, also providing the small degree of adjustment for accurate corner weighting.

Note that we're not talking about a wide range of height adjustment here; that's because the MSS kit is intended for dynamic improvement, not just to lower the car for appearance sake, and the range of height adjustment has to be compatible with the internal stroke of the magnetic damping units.

In any case, lowering the ride height too much reduces the spring travel to a minimum and results in a harsh ride and loss of control as the car skips over bumps and holes in the road, not to mention the possibility of clearance problems between tyre and wheelarch. A low ride height and restricted spring travel may not be a problem for a race car on a smooth circuit, but for road use the requirements are completely different.

The nett result of all this combined effort is a fully resolved suspension set-up for the Series 2 (8J) TT which results in substantially improved overall handling performance, while still providing a civilised ride quality, retaining the full function of the Magneride system to switch between Sports and Comfort settings.

At the recent AutoMetrix VW-Audi track day at Castle Combe we were treated to a passenger ride around the circuit in William's TT RS, with Jim Mew at the wheel. We've been subjected to many such hot laps of Castle Combe over the years, but not many have instilled such a sense of confidence in the stability and handling of the car as this session, particularly bearing in mind that Jim was circulating at considerably higher speeds than most.

Suitably impressed with its dynamic ability, we were just as keen to see how the car handled out on the local roads and so I got behind the wheel for a few miles up and down the B4039 from Castle Combe towards the A46 and back. Combining fast-flowing bends with more than a few lumps and bumps, plus potholes and rough edges, this gave a much more realistic impression of the car's everyday roadability.

It has been a while since I'd driven a standard TT RS, so this wasn't a definitive 'before and after' evaluation, but I've driven quite a few modified cars in my time and this was clearly amongst the very best for ride quality. Probably a better assessment can be found on the MSS website, where several owners have

already provided glowing testimonials based on their own impressions of the handling and ride quality before and after fitting the MSS kit.

Having perfected the MSS kit for the Series 2 TT, William now plans to apply the same principles on models from other brands, including Volkswagen, Porsche and BMW, during the coming year. A kit is currently under final development and testing for the Scirocco with the standard factory-fitted adaptive chassis control (ACC) suspension system, and MSS plans to release kits for the Mk 6 and Mk 7 Golf platforms within the next year. There is also an MSS brake upgrade in the offing.

In conclusion, MSS has clearly developed a refined suspension kit for the enthusiastic driver, designed to improve the dynamic ability of the car by a considerable degree while still retaining refinement and a good ride quality for everyday road use. It also provides a small degree of height adjustment, at considerably less expense and with a much reduced fitting time compared with a typical coilover suspension kit.

For more details of the MSS suspension system, log on at [www.msskits.com](http://www.msskits.com) 