



## B1-3.5 Sport Suspension

Modifying a car suspension system can be likened to walking a tightrope. Enthusiastic drivers will want the ride to be firm, whilst still offering reasonable comfort. The chassis must perform with all of the standard cars' positive attributes, removing the negative ones, whilst offering a more direct handling stance and improve all of the dynamic criteria.



The first tool in the suspension tuners' armoury is the road springs. They dictate the primary stiffness of the suspension, and control the ride height of the car at front and rear axles.

They also have a significant impact on the roll stiffness and aerodynamic stability as secondary factors. It is clear therefore that this starting point will be critical in its influence over every chassis tuning component.

The problem here is that most tuners have a hugely mistaken belief that a sporty suspension must be inherently stiff, moreover it must also always be stiffer than standard.



When we set out to address ride quality problems, we took information and characteristic data from some of the industries foremost experts, and compared professional road testers opinions of various vehicles.

We determined that the characteristics we required were those of the finest handling cars on the planet. There could be no doubt that if we could achieve a ride quality and handling balance of the E30 M3, our job would be done. We did not restrict ourselves in our search to only the BMW marque. We also identified Lotus and Jaguar as particularly competent exponents of the "Art Of Ride And Handling".



We tested the rates of standard springs, and renowned tuners product too. Testing of the I Series chassis ultimately dictated the final prototype spec.

With the first prototype set on the car, it was immediately obvious that the balance of the car had become more neutral, had vastly reduced the tendency of the car to hop across the peaks of bumps, loosing traction at the same time.

More importantly, the ride quality had improved to a massive degree. We were definitely on to something.....



## Suspension Development

After consultation with our suspension Guru, we were told to restrict our search for the correct shock absorber components to Bilstein. Their gas assisted shock absorbers can be easily tuned to achieve genuine damper curves. That is to say you can have different damper rates for slow and high speed damping. Thus it is possible to achieve good ride quality characteristics alongside superb handling capabilities at high speeds and loads.

Many shock absorber manufacturers publish damping curves, but in truth cannot really produce anything like the reverse gradients required for our project.

So, armed with the test car on the prototype springs, we set about the task of drawing damper curves. Once again, we road and dyno tested various different damper sets, found the versions that were closest to our ideal set-up, and produced drawings of our ideal curves using existing curves as a basis.

Bilstein quickly re-valved an existing damper set to our spec. We can only say that on installation, the results were a revelation! In the "before" settings, this amazingly quick car would communicate "back off", causing the driver to hold back on the power when driving through and out of curves. After installing the complete prototype set, the car encourages use of the power way earlier, and without fear of the consequences of overambitious throttle application. Indeed the immediate impression on our B road circuit was that exit speeds were now so much higher, approaching to previous braking points seems we were at least 20mph faster.

You can feel the tyre smearing itself into the tarmac, the gentle build up of roll oversteer, but without the feeling that the car may suddenly loose grip on a bump, and pitch you through a hedge.

To be honest, we have yet to find any downsides (surely there must be some somewhere!)

## What else do you need?

As previously documented on this website, there are three things that immediately bring the 1 Series chassis up to scratch. Despite the revelations achieved by the B1-3.5 suspension, our views have not changed in that respect. So to enjoy this car in it's ultimate configuration, you will need to consider the Quaife differential, conventional (Non-runflat) tyres, and our anti-roll stabiliser set. We can recommend the perfect combination of equipment for your specific needs. In particular, we have consistently gravitated to Continental Sport Contact 3 tyres, due to their incredibly consistent on-limit wet weather characteristics.

However, drivers will still benefit from the B1-3.5 suspension on and otherwise standard car. The ride quality improvement over the M-Sport suspension is massive, as is the handling balance and accessibility of performance. We also offer B1 Spring sets separately, which are available for both M-Sport and standard BMW suspension dampers.

## Adjustable Suspension Kit?

No way! Firstly, there is no means of adjusting the spring stiffness. Secondly, there can only be one correct standard damper rate for any given spring. Thirdly, anyone capable of correctly specifying spring and damper rates correctly is usually an industry professional. Leave this task to even the most experienced tuner, and what you are being offered is a hundred ways to get the set-up wrong. Even professional race teams tend to have only two settings. One for the wet, and one for the dry.

**In our opinion, this is to be avoided!**



## An Industry First?



We believe we are the only tuner to offer asymmetric spring rates, to counteract the inherent weight imbalance of right-hand-drive BMW cars, and to take into account BMWs compromised fascination for a 50-50 weight balance!