



# Keep It In Line

Make it go where you're pointing it with wheel alignment by the experts.

Ever since *Total BMW* started, we've lost count of the number of enquiries about wheel alignment problems. It seems to crop up more with the E34 5-Series than any other model but we've had moans and groans about lowered E36 3-Series that feel weird to drive and wear tyres out.

On cars like the E34 with a steering box there are quite a number of bushes and balljoints on the front end. A lot of the problems don't come from this, but from when the car is repaired and the wheel alignment isn't set up again.

If you've fitted lowering springs to your car, you'll need a four-wheel alignment inspection and one of the best services around is the KDS check offered by your BMW dealer. The system is manufactured by Beissbarth and KDS stands for Kinematic Diagnosis System.

Rather than the usual wheel alignment gauges seen in tyre shops, the system uses cameras mounted on each wheel which talk to each other from front to back and side to side. This gives information to the central computer which holds data for just about every BMW back to the E21 3-Series. Once the data's been input it'll give a red fail or green pass for all aspects of the alignment. On cars like the old E28 and E30, how much can be adjusted is limited, but the E36s are an odyssey, as are the E34s.

To test the system, we used two cars from opposite ends of the BMW spectrum — a 1987 E28 518i and a 1998 323i Coupé. Over the next 10 stages we'll tell you how it's done and what we found. The 518i in particular was a bit of a problem child with strange front tyre wear and a tendency to pull to the left. What did Bridgegate BMW find?



The first stage is to put the car on the ramp with its wheels on the circular discs and then to fit the four cameras. These will only fit BMW wheels with the five location holes. So if you have weird alloy wheels, you'll need to give prior notice so a set can be found and fitted for the operation. Tyre pressures need to be correct and if the car has been lowered or has a bodykit the special adapters to lower the cameras need to be fitted.

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"Who owns this thing anyway?" asks Andy in horror as he loads the computer up with the correct model information. This gives the exact information with a given plus or minus for each setting. Now the boot needs to be filled with sandbags to weigh it down and give the ride height predetermined by the computer.



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Andy then adjusted the tracking back to factory-spec. This reversed the camber exactly, so now the other strut was angled. It's all about compromise with a car this old and some finite tracking adjustments equalled things up. Obviously, if there's a balljoint, bush or a strut top mount that's not too healthy then you'll need to sort that out first. An experienced BMW technician will know what matters and what doesn't.



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With that set and the wheel centred, the machine takes the readings and brings them all up on screen. The old 518i gets almost a whole set of red fails — what a surprise. On cars like this and the 6-Series, the rear end is only adjustable with offset bushes, which isn't a five-minute job. On our car, the rear end was fine but the toe angle (tracking) was a mile out at 25 degrees as opposed to nine. Although the camber was OK as a whole, one side was at an angle and the other almost vertical. BMW's double-pivot front suspension means that major tracking irregularity will result in other geometry being wrong too.



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Now for the modern stuff. An E36 is a very adjustable car in the suspension department and it's all spanner work with the proper BMW tools. Here we've got the front strut top bolt which is normally sleeved. By replacing it with a non-sleeved bolt, you've got a lot more to play with and you can adjust the camber loads. Obviously, there's a proper BMW bolt for this, not just something you'd buy from the masonry department at B&Q.

There's plenty to be done at the rear end too, unlike older cars such as the E30 and E34. The E36 rear wheels can be adjusted for tracking or camber and to set it there's a special bolt where the lower wishbone meets the rear hub assembly. With the special tool, the BMW mechanic can alter the angle of the rear wheel and turn a fail into a pass. With cars that have been lowered by even 25 mm, this measurement will be totally wrong. BMW must have known people were going to slam the E36 and helped out at the design stage.



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Likewise, the toe of the rear wheel can be altered. By slackening off the three 17 mm bolts, the mechanic can use the special BMW tool to alter the position of the rear arm mounting plate on the body. Again, lowering the car will affect the angle of the rear arm and that's why a lowered car will often drive like a three-legged bar stool.



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The big problem with old BMWs is just that, they're old. One duff damper, one failed bush and the whole lot goes out of sync. Our cars were both OK in this respect but if you need new bushes then get them done. It might be a pain in the wallet but once you've stopped replacing tyres every 6000 miles and realise just how much better your car drives, it's money well spent. After all, you bought a BMW to enjoy it.



11

The latest BMWs are even more adjustable so there's no excuse for wearing your rubber out. The special tool fits on top of the strut on this E46 3-Series and once the three top strut nuts have been loosened up it's used to perfect the camber. Lowering any BMW means that you're increasing the negative camber, ie moving the top of the wheel in towards the body, which wears the inside of the tyres out. And once you've altered the camber, the toe in is wrong, front and rear. Suddenly £99 doesn't seem expensive.



08

One problem with cars like the E34 5-Series is that as bits on the front end have been replaced, the steering box has gone off-centre. That meant after replacing a steering joint or two, the steering wheel wasn't straight and, rather than do it properly, a bodger just took the steering wheel off and put it on straight. The steering box is then off-centre and boy, can that make the car feel odd to drive as it has its preload set straight-ahead. It feels like it's driving on ice in a straight line, which is horrid. Ask your dealer to centre the steering box properly, refit the steering wheel and start from there.



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Andy, Jonathan and Mike admire the list of red fails the KDS computer screen produced once it had finished laughing. Adjustment of the toe angle brought the rest of the problem areas back into shape and the car lost its love for grass verges. With the strange geometry employed by BMW, the bloke at the tyre centre will be there forever trying to get it right and rubbing his hands with glee as you return for another pair of £200 tyres in three months' time.

**KDS Deal**

If you live in the Chesterfield area then get yourself down to BMW dealer Bridgegate (01246 208681) before January 31 and it'll put your car on the KDS machine, check and correct any discrepancies and give you a printout for just £99 including VAT.