



## One for the road, and the track – Project GTV

**Peter Cambridge, the brains behind the Prodrive Brera S and now independent vehicle dynamics expert, gets to grips with a club member's 916 GTV, helping to transform it into a real road and track tour de force. The lucky man with the Alfa is Dave McFarland from Derbyshire. In what we hope is the first in a series of items, Peter starts by describing exactly what's been done so far . . .**

I first met Dave McFarland at one of the regular monthly meetings of the East Midlands Section run by John Griffiths back in 2009. I was giving a presentation on the Brera S after a suggestion by AROC member Pete Brailsford, who used to work at Bilstein UK, that the group would like to hear about the project. Pete was often around at Bilstein when we were doing the damper tuning and witnessed the challenge of trying to get the steering feel and response we needed on the 3.2 Brera S without sacrificing too much comfort. Dave was very interested in the suspension changes that were made to the 'S' and was keen to see how revising the static geometry on his 2000 3.0 GTV (916) would change the way it drove. He was the

first Alfa owner to have their alignment set up by me at Protyre in Warwick.

When I saw the GTV for the first time and chatted to Dave it became clear that this was no standard Alfa. The front brakes were the larger 330mm discs and calipers from the 147 GTA. The gearbox had been fitted with a Q2 differential and the clutch replaced by a single plate one. A GTA inlet cam now sat above each bank of cylinders and to reduce back pressure, and enhance the classic 'Busso' V6 exhaust note, a stainless steel system was fitted with a Cat replacement pipe. The suspension had also received attention too with Koni dampers and Eibach Pro-Kit springs.

After an hour or so of measuring and setting with the guys at Protyre. Dave left for a spirited drive back up to Derbyshire. I received an email the next day saying "The car is Fantastic! I had a great drive home, drove much too fast, especially on the A38 other cars kept getting in the way! The car feels more 'alive' if that makes sense, ready for directional changes without being nervous, the steering feels more connected and inspires confidence. When you want to make a turn the car wants to go with you without any hesitation, especially in an S bend. I also noticed

that it tracks very straight and true with no 'Alfa Walk' as they say about the straight ahead."

Dave was happy with the way the GTV was driving but this was not just a car to enjoy on the road. Dave regularly takes it on track days, both in England and in Ireland. The track day scene is rapidly expanding and many people have a car specifically for it. Usually a car that works well on the road is far too soft on the track, and vice versa, but they can still be a lot of fun. Dave's plan for the GTV is to strike the best compromise for both the road and the track. Imagine driving all the way to Mondello Park near Dublin, 250 miles with a rest on the ferry, in a rock hard race car. You'd even be too fatigued for a Guinness!

Dave has got history, Alfa history that is! He has been the owner of two GTV6s and was lucky enough to own one of the few SZs that came into the country. The GTV V6 (916) is his first front wheel drive Alfa. It's interesting comparing the specifications of the different cars to see how they've developed over the years. The GTV6 had a kerb weight of 1210Kg, the SZ 1256Kg and the GTV (916) 1415Kg. The wheelbases have grown being 2400mm, 2510mm and 2540mm respectively. The power increased, naturally, with the cars having 160bhp, 207bhp and 217bhp



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giving 0 to 60Mph times of 8.9s, 6.9s and 6.6s. Newer, larger and heavier but a little quicker!

These facts had not gone unnoticed by Dave. As well as being an Alfa man he is also a biker. I think riding powerful bikes teaches you that less is more. Less weight, less protection and less home comforts, when you are travelling, equals more fun! He's taking this attitude to his GTV project and trying to remove unnecessary weight. (He also wears a helmet when he's driving it – on a track day that is!) This has started with the unsprung weight. Working with BG Developments Dave has specified, and had manufactured, a pair of high performance front brake discs with AP rotors and custom aluminium bells. They look superb and save 2.9 Kg per assembly. He has also specified lightweight road wheels made for him by Team Dynamics in West Bromwich. They are an 8J x 17" Pro Race 1.2 in the standard offset of ET30.5mm.

We had some good discussions about the wheel sizes and offsets to make sure the change worked well. Dave had selected a sticky Yokohama AD08 225/45 R17 suitable for both the road and track. According to the official tyre bible from ETRTO (The European Tyre and Rim Technical Organisation) a 225/45 R17 can be fitted to wheels from 7" to 8½" wide. We needed the tyre walls to be stable as it will be heavily loaded on the track. Fitting the tyre to a narrow rim makes a car feel loose and unstable, especially with stiffer suspension, and can take away driver confidence. An 8" wide rim stretches the tyre a little and makes the side walls square on the rim. Running the standard offset meant there were no clearance issues and the torque steer was no worse than standard.

Between track days Dave made some further changes to enhance the handling and help his understanding of how the car is performing. He fitted the superb anti-roll bar kit from Alphasolics that has helped keep the car flatter on the track and also given a better balance. He has also experimented with alternative rear dampers, swapping between the adjustable Konis and a fixed rate pair of Bilsteins. Modern technology also arrived in the shape of a tyre pressure and temperature monitoring system from Tyre Pal.

The mechanical and cosmetic side of the car was also being looked after. Dave bought a whole rear subframe assembly and had been painstakingly stripping, cleaning, powder coating and reassembling it with new bushes and joints before swapping it onto the car. This

lead to another alignment session with me at Protyre, where we got everything straight and the car driving precisely again. The car performed really well on the next track day however Dave is a perfectionist and wants to extract the full potential from the GTV and discussions moved on to what we could do with the springs and dampers to make it more suitable for the track.

The most extreme suspension I have developed so far was the Mountune Club Sport kit for the Ford Focus RS. It was aimed at the track day users who wanted the best performance on the track and were prepared to accept a very firm drive on the road. The expectation was that RS owners fitting the kit had a second car and only used their RS for fun on the road but I know one owner who commutes down the M40 in his every day, with a couple of his work colleagues enjoying the ride! This is where Dave wanted to take his GTV, but with the ability of soften it off if necessary.

We started the new suspension development with a day of weighing and measuring the GTV at Dave's home. The weather was superb and I was able to top up my tan as we worked on the drive. Someone very important must like Alfas! The GTV weighed in at 1421Kg. Not too far from the official figure quoted above. This is in the kerb condition which is unladen but with full fluids and a full tank of fuel. The distribution was 63% front and 37% rear and is quite typical of a front wheel drive. In the 2-up load condition, with Dave and me sitting in the front seats, the distribution changed slightly to 62% front and 38% rear. The total weight is a closely guarded secret though! There was some asymmetry with the right front and left rear carrying more of the weight. We are going to see how far we can correct this in the future.

We stripped one side of the car so we could measure the front and rear suspension travels and ratios. This is the normal process I go through at the start of a project so I can see how the car has been designed and understand the likely compromises I will have to make. Important things like the distance to the bump stops, or spring aids as they are referred to by the car manufacturers, has to be taken into account. If a car is lowered it makes contact with the bump stops sooner. This can make the car feel firmer, which may be a good thing, but can also significantly change the balance of the car. Usually the front bump stops are quite firm, compared to the rear, so



Dave discussing track action with George Cole

the suspension gets stiffer more quickly at the front and more understeer is the result. The bump stops also limit how much upward travel the wheel has when hitting bumps, hence the name. This prevents the tyre hitting the wheel arch liner but also prevents drive shafts and steering and anti-roll bar link joints over travelling and necking out, potentially causing a failure. Just cutting them down can help one issue but could cause another.

Using all this information Dave and I are going to decide on the best course of action for the suspension. Do we make some custom dampers and springs or are there off the shelf kits available that we can tune to get the best compromise for the road and track? There will be a follow up article to explain what we decide to do and how the GTV drives. That won't be the finish of the story about the car however; Dave has plans to modify it further with upgraded rear brakes, a light weight battery and, more significantly, an engine change. Maybe this will have to turn into a series. . . Alfa ownership is certainly fun and brings out the creativity of the owners!

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Work in progress



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