Handling and the Morgan Three Wheeler.

Phil Gardner

I already know that the Morgan 3-Wheeler can turn any journey into an adventure, even if it doesn't break down whilst you were on your way, it's just that sort of car. I have driven and owned some great fun, lightweight sports cars in my time, but somehow the thrill of the 1930's vibe and retro handling of the M3W makes it feel so different to anything else I've owned before. Part of the excitement of driving the car is the way the driver needs to get properly involved with the handling of the thing, rising to the challenge of getting the best out of it, whatever the road. Spend enough time in the driver's seat however and it's easy to perhaps forgive some of the cars handling idiosyncrasies and even mistake them for positive signs of agility and ability, but I'm not really sure that's entirely a good thing….

Everyone approaches driving differently and I am happy to admit that driving cars (and previously riding motorcycles) is so much a part of my core DNA that I cannot imagine not enjoying the privilege of doing so every day of the year. No journey is a chore and every opportunity to get from A-to-B on 2, 3 or 4 wheels is something I relish, regardless of weather, season, time of day or vehicle (leaving the exit ramp of an underground carpark in Berlin a few years ago with the prospect of a 720 mile, one-stop drive home might be someone's worst nightmare, but for me it was simply a fabulous day out). I want to do my best to drive as well as I can, enjoy the feedback, feel, movement, dynamics, ride, handling, noise and smell of the things – and get VERY annoyed when I do something wrong. I want to have a decent *conversation* with the car or bike or tricycle every time I'm in one. Yup, a bit sad I guess. Others appreciate their cars just as much, but are far happier to enjoy other aspects of their journeys – the sights and sounds, country smells, wind-in-the-hair, off-beat rumble of the engine and cheery waves of other drivers – and remain perfectly content with the way their cars drive and how the MMC designed them to be driven. However, I am certain that nobody buying into the Morgan family will ever consider the cars to simply be transport and nothing more.

So, having shared that, you can probably appreciate why I take the ride and handling abilities of my M3W somewhat seriously and why I have spent a very long time evolving the setup of my car to the point where I now believe it is simply the best it can be. Not the fastest round a track for sure, but best at what I want it to do – give maximum enjoyment and fun as a road car. Some (actually many) aspects of how the car drove in those early days really bugged me and things had to change. This article tries to describe that journey and hopefully some of this will resonate with those of a similar mind…

My engine setup journey has already been reproduced on these pages and I remain as pleased now with the way the car powers itself and indeed that same setup and configuration continues to this day, as it does exactly what I want it to do and feels perfectly optimised for road driving. The handling however has always thrilled and bugged me in equal measure, so shortly after buying it the research started….

Here's the route and steps I took to achieve a setup with which I am now entirely happy.

Step 1 – The Bump Steer Issue and Ride Height

At this point I should point out that my car was a mid-2013 build which started life with what seems to be known as the *Mk1.5* chassis, in that it had a simple bolt-in cross-brace bar that spanned the upper wishbones and also came with fixed setup Spax shocks and the associated ride-height differences that this config brought over and above the original 2012 cars with Suplex front shocks. Cars configured with the Suplex units typically ran a ride-height that ensured that the lower wishbones and track control arms (the bits that stick out from the ends of the steering rack) both ran broadly parallel with the road surface and this is how the cars were originally released. This is important because this setup did not typically suffer from the much criticised Bump Steer phenomenon identified in later cars.

Bump Steer, as the name suggests, is a handling trait that sees the car steer unexpectedly when it hits a bump and does pretty much what it says on the tin. This is a relatively rare phenomenon these days, primarily as knowledge of effective suspension design is improving all the time and cars are getting increasingly heavier and more isolating in terms of what's happening at the sharp end. However, this *feature* of those early Spax-equiped cars quickly became a nuisance to anyone regularly driving with spirit down Britain's bumpy, pot-holed roads, particularly when a badly timed bump sees the car try to steer you towards oncoming traffic.

In an idea world, the front suspension of a car can move through its entire range of movement without causing a change in steering angle, as the geometry of the suspension arms and track control arms are *in-sync* and might be considered to complement each other just fine. Have a look at someone bouncing the front of a Caterham Se7en and observe how little those exposed front wheels turn, despite the fulsome movement of the front suspension. Whilst this is a hugely complex topic and I don't for one minute claim to be an expert, I do know that for a design like the M3W, the pivot points for the upper wishbone and corresponding track control arm do ideally need to be in the same vertical plane, such that their effective lengths as they travel through their range of movement are all broadly the same. If they are not, then the track control arm effective length can change more, relative to that of the suspension wishbones, resulting in the wheel changing direction slightly. This is what causes bump-steer and driving on a lumpy road at speed has seen many a badly setup M3W dive either for the weeds or the approaching car with similarly unpleasant potential consequences.

So ideally we want to try to minimise these differences in effective length change as the suspension goes through its range of travel and one easy way to achieve this is to have the track-rod arms and lower wishbones both broadly horizontal in the first place. Although this won't cure the root cause (the different position pivot joints for the track-rod arms relative to those of the wishbones), it will at least keep the symptoms to a minimum. The Factory approach to this was not to lower the cars, but to instead lift the height of the steering Track Rod arm at the point that it connects to the upright – this simply puts the arm approximately horizontal to the road and roughly in the middle of its typical range of travel. This does not cure the problem, but it goes some way to minimising the undesirable effects and for some folks this is a sufficiently effective fix, without affecting ride-height. It is a compromise approach though.

However, a rather more useful 'partial fix' is to lower the car as mentioned above, to once again get those wishbones and (original mounting position) track rod steering arms horizontal as well. It is possible to do this using spring/damper units with adjustable platforms – just like the Spax Adjustable units from AeroRacing and that remain available to this day.

I purchased a set of these for both front and rear and although the setup of the front of my car has moved on again (more on that later), the Spax Adjustables remain in place on the back of my 3-Wheeler and continue to work well. They are easy to fit and adjust with just basic tools from the garage. However you will need a C-Spanner to adjust the spring platforms, which doesn't seem to be available from the Factory, although plenty are available from Spax themselves or aftermarket.

Here's the kit from the AeroRacing website (PART NUMBER: SP160002);

Once the car has been lowered, the wishbones and steering arms are much closer to horizontal, which will help to reduce the effect of bump steer, although the fundamental suspension design means that this will never be irradicated completed. Here's a picture of my car sitting suitably low (about 12cm from bottom of front body to the ground) – note the shocks are black painted, not red;

In Summary – Ride Height Adjustment

With adjustable spring platforms, the ride height can be reduced such that the wishbones and steering arms are closer to horizontal, which helps to minimise changes in Toe and Camber during bump, the ultimate cause of bump steer. This is an alternative to fitting the Comfort Kit to pre-2014/2015 chassis, which simply lifts the steering arms up using spacers. Later cars were built with different suspension uprights that raised the mounting point for the steering arms instead, which whilst addressing the same issue with a similar degree of partial success, did introduce a lighter, lazier steering response, from which the modification took its name, ie: *Comfort*

What do I gain?

Less deflection when encountering a bump, particularly whilst cornering. Improved stability overall, much less chance of the car actively trying to *steer* across an entirely straight road, simply due to hitting a bump or pothole. Much improved looks (in my opinion).

More importantly, the Spax Adjustable unit is a higher quality damper (relative to the stock, non-adjustable version) and allows the owner to vary the degree of damping available to add control to the suspension travel, improving front stability, roadholding and generally improving the handling. Suspension firmness and feedback can be adjusted according to individual preference, road conditions and the use to which the cars are put by different owners.

Compromises?

Less ground clearance, more chance of undercarriage contact with lumps and bumps. Cost (at time of writing – Dec 2020 - approx. £380 +fitting for the front pair, similar for the rear pair).

Step 2 – The Bump Steer Issue and the Empire / Krazy Horse Wishbone Kit

Many owners will be perfectly happy with the improvements to bump steer by fitting either the Comfort Kit or height-adjustable dampers, which is great. However, there is still a significant amount of this undesirable trait left in the system in my view and the only true fix is to fit an alternative upper wishbone to move the pivot point for that wishbone to align with that of the steering track rod balljoint (the greasy knuckle that you can feel inside the rubber steering gaiter if you give it a bit of a squeeze). With these two components pivoting around the same point, their effective changes in length as they travel through the suspension strokes are nearly the same, which means the car doesn't try to steer itself just because it has been over a large bump in the road.

The wishbone kit was originally designed and built for one of our early M3W adopters by Empire Racing Cars, a very experienced race car builder based down in Somerset. This was quite some undertaking but I am very grateful to all concerned as the end result is a magnificently engineered solution, beautifully made and very effective indeed. It is *relatively* easy to fit, but does require a partial strip-down of the front suspension and careful use of tools so as not to damage the paintwork, nor short out the electrics…. Here's a picture of the kit on the bench before fitting;

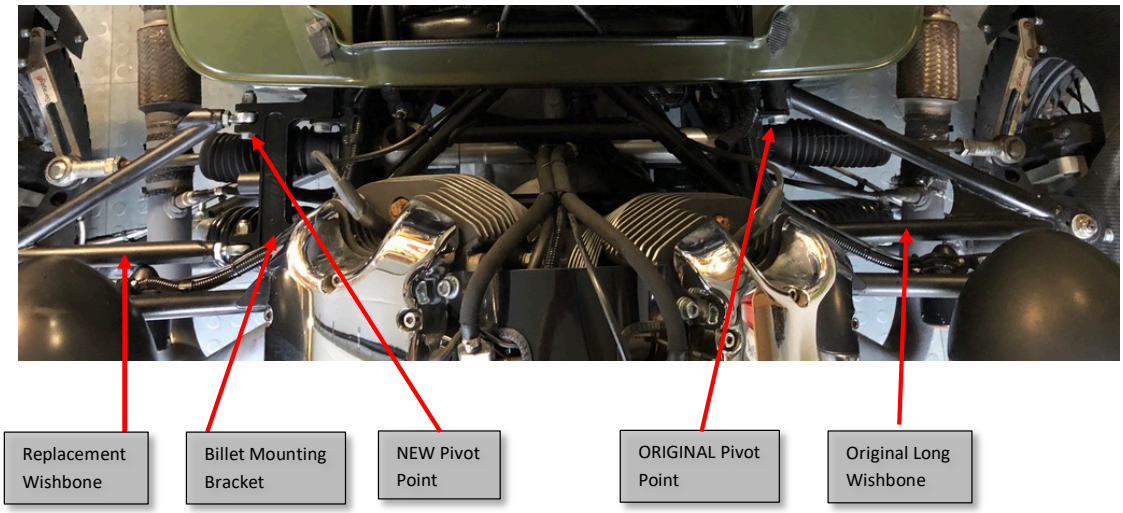
Each side has a replacement top wishbone, adjustable spherical rose-joints, a billet bracket that bolts onto the original upper wishbone mounts and a bracing tie-rod that secures the bracket to the chassis via the lower engine mount. The adjustable spherical joints allow variation of both Camber and Caster Angles, to further optimise the handling and driving characteristics of the car.

Most of the kits are simply polished aluminium finish, but I have always had an unnatural aversion to shiny things and requested that they be anodised black, which they were happy to do for me.

These kits remain available via Krazy Horse (currently £995+vat fitted), often as part of a more significant Handling Pack (which includes Ohlins suspension units, more of which later…)

https://krazyhorse.co.uk/pages/morgan-3-wheeler-upgrades

In the picture below the LHS is on Empire, the RHS the original wishbones – the difference can be easily seen;



In Summary – Empire / Krazy Horse Wishbone Kit

This well engineered solution provides the best defence to the dreaded bump steer phenomenon, as it fundamentally addresses the geometry problem by moving the upper wishbone pivot point to align with that of the steering arm joint. This drastically reduces Camber and Toe changes that occur during *bump* that are inherent with the original design, improving stability and most importantly, driver confidence.

What do I gain?

Simply put, a better handling, more predictable motor-tricycle, improved driver confidence, less need for a vice-like grip of the wheel when travelling down bumpy roads and satisfaction of having a very well designed solution. In addition, Caster and Camber are now adjustable, providing further opportunities to fine tune the driving experience to individual preference.

Compromises?

Not insignificant cost (broadly £1,200 fitted, including a potentially long round-trip to Krazy Horse at Bury St Edmunds), more components to monitor for wear and replace accordingly (the spherical rose joints are not expensive, but don't last forever) and the need to explain to folks exactly what you've done and why it works, quite often…

Step 3 – Unsprung Weight and its Troublesome Management, Part 1

Having addressed the issues surrounding bump steer, as well as improving the quality and adjustability of the damping, many would assume that there's little left to do along the journey to handling happiness. However, like all things in life, there are always further improvements to be made, but they predictably mostly come at a cost – that's just the universal law of diminishing returns.

The Spax Adjustable dampers described above offer a decent improvement in suspension control over the stock items, but they might be best described as a mid-range performance option in relative terms – first step on the ladder as it were, considering the much more expensive options that are also available in the M3W marketplace (such as Ohlins units, more of which later). Whilst these upgraded dampers offer improvements in performance over the OEM units, we could further help them do their job by making things easier for them overall. Let me explain…

The job of a damper is simply to fundamentally control the up and down movement of the wheel and other associated componentry (wheel, tyre, inner tube, suspension arms, mudguard in the case of the M3W – or as we call this lot collectively, the *Unsprung Mass or Unsprung Weight*). Combined, this is the mass that the dampers have to try to control as the components bounce about having hit a bump or pothole, dip, lump or crest in the road – and at different rates and speeds. This is a tough job at the best of times and the better engineered and higher quality the damper unit, the better it is at doing this job. A job well done here allows the tyre to maintain best contact with the road to provide best grip, provides a comfortable, compliant ride quality and can maintain this high quality performance over a wide range of operating speeds, temperatures and general conditions. Once again the general rules of engineering apply – the more you spend, generally, the more you get.

The conditions in which a damper has to work on the M3W are perhaps more extreme than some other vehicles for a number of reasons – the two most important being proximity to massively hot exhaust pipes and engine, plus the relatively short throw or range of movement through which the damper travels from full droop to full compression. The former is important as the main damping medium is oil, which as we know changes viscosity with temperature, so it has to work as well at high temps as it does at low. The latter, as Colin Chapman proved so long ago, is that the best road suspension should be long of travel and very well damped – providing control with good ride quality - but the M3W damper, due to positioning, does not enjoy very much in terms of suspension travel, so the damping has to do its best work over a shorter than ideal distance of stroke. This is just a factor of the design primarily, but it is one of the reasons that the Morgan Three Wheeler is sensitive to suspension setup and quality.

One of the biggest factors influencing the ability of the dampers to control their relevant corner is unsprung mass, as mentioned above – put simply, the more there is the harder the dampers have to work. Factor in variances in operating conditions and it's clear that the less unsprung mass, the less work the damper has to do. Have you ever noticed that in the height of summer your Morgan suspension feels better at the start of your journey than it does a few hours later, having driven spiritedly as well as getting stuck in hot traffic? This is a sign that the dampers are not able to work well at extremes of temperature and driving conditions, which is why this unsprung weight thing is such a big deal. So let's look at what we might be able to do to reduce this.

As we've seen, the total *unsprung mass* is made up of the total mass (either 100% of each individual part or a proportionate element of each), of the following, in the case of the Morgan Three Wheeler;

1. The Wheel – a 2.5”x19” MWS supplied, steel-rimmed, steel-centred wire type
2. The tyre – a 4.00x19 cross ply, typically the OEM Avon or popular Blockley
3. The Inner Tube – a heavy duty, schrader-valved rubber type
4. The Mudguard – a steel painted item, keeping mess out of reach of eyes and people
5. The Brake Disc and Pads – an alloy 4-pot calliper with small pads
6. The suspension upright – a compact steel device connecting the front parts together
7. The wishbones and steering tie rod – or an element of these, as one end is chassis mounted.

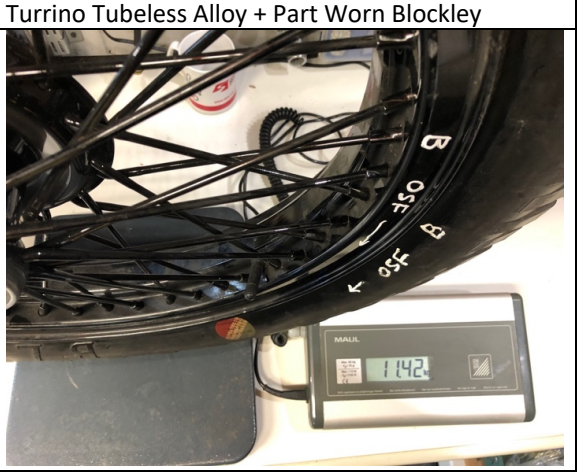
All those things above weight quite a lot, which means that the poor old dampers have to do a lot of controlling of mass over what we have seen to be a much shorter stroke than would be idea. This is why good quality dampers make such a difference and why manufacturers of high performance sports cars will spend many millions of their Pounds, Euro’s or Dollars to design and build the lightest parts into the most important areas of the cars (unless of course they build massive SUV’s, in which case few care how they drive whatsoever, but don’t get me started on those….!)

So if we *really* wanted to go to town on unsprung mass weight reduction, we could look to remake or re-engineer all of the above components in pursuit of the best improvements available. But we should remember that part of the fun of our cars is that they are not exactly *normal* and will never handle like a race car. But some of those components are very easy to lighten (No.4, the mudguard for example) and others spin fast (No’s 1, 2 and 3), which adds a whole new dimension in terms of reciprocating mass reduction, more of which later.

As you might expect, I’d like to focus on the easier improvements, so that means No’s 1, 2, 3 and 4 only, in reality. As a starting point, let’s look at some bald figures, based on my own tolerably accurate weight scales;

Component	Material	Weight
Standard MWS 19” Wire Wheel (steel spokes and centre housing)	Steel	8.2kg
Turrino Alloy Rimmed 19” Tubeless Wheel (steel spokes and centre)	Alloy	5.9kg
NEW Blockley 4.00x19 Tyre	Rubber	6.0kg
1/3 worn Blockley 4.00x19 Tyre	Rubber	5.5kg
19” Heavy Duty MWS/Blockley Inner Tube	Rubber	1.0kg
Standard Morgan Mudguard (including fittings)	Steel	3.62kg
Garage-56 Carbon-Kevlar Mudguard (including fittings)	Carbon	1.16kg

And a couple of pictures to support those weights shown above (using same part-worn Blockley);

Standard MWS Wheel + Part Worn Blockley	Turrino Tubeless Alloy + Part Worn Blockley
	

Standard MMC Steel Mudguard	Garage-56 Carbon-Kevlar Mudguard
	

So let's start with the easy mudguard change – steel @3.62kg versus carbon @1.16kg, that's approximately 2.5kg weight saving per side. That's a chunky 2.5kg (two and a half bags of sugar) that *doesn't* need to be controlled at speed after a bump, giving the dampers less to do, so that what they can do is done better. 2.5kg would be considered a decent weight saving in any unsprung setup, but as the Morgan components are at the generally lighter end of the overall scale (being broadly smaller and more compact that those of other vehicles) the relative percentage gains are much more obvious.

In Summary – Garage-56 Carbon/Kevlar Mudguards

These mudguards are beautifully made, in my experience fit perfectly and provide far more than just good looks (personally I prefer the satin, unpainted finish, which is a little more *SteamPunk* I think and more to my tastes). The dampers have less work to do, have more stability and resilience to overheating and very much support the Chapman approach of *adding lightness* .

What do I gain?

Simply a more comfortable ride, better bump absorption and slightly improved feedback and feel from the front end. If you fancy seeing how much better the car feels without this weight, then steal yourself to simply remove the steel mudguards and go for a quick drive around familiar local roads – you'll save 3.62kg immediately and the difference should be instantly obvious. They look fabulous as well.

Compromises?

Hmm, they're really rather expensive (approx. £1,200!) and are inevitably more delicate than the steel originals, although they will never rust…. And if you do try a lap of your local roads running without any mudguards, this might be frowned upon by the local Constabulary on account of UK Road Construction & Use regulations, so keep any test drive short and maybe think of a decent excuse should you be stopped ☺. If however you live in a part of the world without these

restrictions, aside from a face-full of clag every now and then, there's little to worry about other than enjoy the reduced unsprung weight benefits.

Step 4 – Unsprung Weight and its Troublesome Management, Part 2

Ok, so that's a not insignificant improvement, but what about those lighter wheels, where do they fit into the cost v's benefit scale? The answer in my view is much higher up the scale, primarily as we are dealing with a rotational mass this time, not a static mass.

I approached Turrino initially to see if it might be possible to build a lighter wheel, as this is already a well understood, best practice approach to improving ride, handling, grip and suspension performance – the racing world have followed this route for years of course. We looked into the components of the standard wheel and looked to see if there was scope for weight loss across all of the component parts – Centre, Spokes, Rim, Tyre, Inner Tube and even wheel nut/spinner. The answer was a very strong YES to Rim and Inner Tube, but it was not deemed worth the effort to re-engineer the steel Centre which was already nicely light, nor the spinner (2-ear in my case), which was only 0.78kg and in terms of rotational mass, it was entirely centre placed.

But the Rim and Inner Tube both have scope for significant weight reduction and best of all, the effects would be realised at the outer edges of the combination where they travel faster and furthest. This means that the gains that might be expected through unsprung weight reduction alone, whilst very real in their own right, are magnified many times on account of being accelerated in circles the entire time.

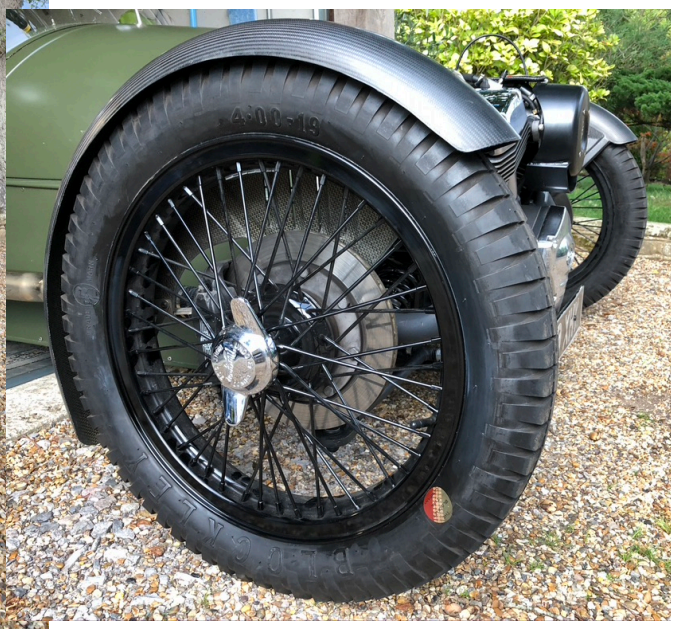
A reciprocating mass takes a certain amount of energy to get it spinning fast and the lighter it is, the easier it is for whatever is powering it to do this. As you can see from the figures above, the Turrino wheel and tyre combination weigh some 3.3kg less than the steel version and 1kg of this is due to the rim design being *Tubeless*, which is a great additional advantage. So not only do we measure a static 3.3kg weight saving, providing exactly the same benefits to unsprung mass as described above, but in addition we have a potentially much bigger reduction in *effective* rotational mass….

It is generally accepted that static weight saving benefits are magnified anywhere between 4x and 7x/8x when that weight saved was being flung round in wide circles – the bigger the running diameter, the better the benefit. The M3W wheel is large diameter and the entire 3.3kg saving is on the outside, which allows us to use the higher end of that benefit range in our calculations. Let's assume that our effective benefit magnification due to position is 7x, then the car will feel and effective benefit of 3.3x7 = 23.1kg. Now that's a lot and this will have a significant benefit in terms of effective Power:Weight numbers. By simply moving to a tubeless, light alloy wheel my car 'feels' as though it is some 46+kg lighter under hard acceleration. That's not far short of 10% of the car's weight, so call it an effective 10% reduction in weight under acceleration – not to be sniffed at. And this on top of the already understood gains in unsprung weight that are now 5.8 real kilograms each side, giving a potential, total of 57.6kg overall perceived benefit – nice ! The car sure feels quicker as a result, no doubting it.

The performance gains are immediately obvious – such a smooth ride, so much less weight to control means that the dampers can be softened a little as they are more able to manage the reduced weight, allowing for that improved ride, less heat increase in the damper fluid and a generally easier time overall. Very happy indeed.

How they started as blocks of billet alloy

Finished Wheel, pre-powder coating.



In Summary – Turrino Alloy-Rimmed Tubeless Wheels

This modification is easy to do, but inevitably costly, although the benefits are worth it in my view.

What do I gain?

Improved ride quality, grip, roadholding and handling finesse. Bumps impact the car far less and kickback through the steering is much reduced. I had mine painted black to match the originals and apart from a change in rim design (tubed use a rolled edge, tubeless a straight edge for bead sealing), I defy anyone to notice if they weren't looking for it. Plus that headline-grabbing 57kg effective weight saving.

Compromises?

Ok, this is an expensive option, coming in at approximately £1000 per side, depending upon finish and spec. So this is obviously not for everyone by any means.

Step 5 – Ohlins Suspension – The Final Piece of the Jigsaw

I should point out at this time that the setup and specification achieved thus far – AeroRacing Spax Adjustable shocks set low, Empire Upper Wishbone Kit and tubeless Turrino rims – has produced a very good handling, comfortable Three Wheeler, with entirely predictable responses and is a joy to drive. There is only one aspect that I feel is still compromised and that is the quality of the damping under more extreme conditions. I enjoyed a very spirited (solo!) drive back from the Grindelwald Jungfrau Treffen in 2018 and was able to make extremely *good progress* across the open, flowing roads of mid-France in temps well over 30^{o}C. Some of the roads were lumpy and bumpy and after a couple of hours the wheel control had gone totally to pot. The shocks were simply too hot to touch – the combined heat from the exhaust, engine, tarmac and over exertion were simply too much for the poor things. Each bump taken at speed resulted in huge deflection, continued 'bounce' whilst trying to deal with the next bump and there was no alternative than to slow right down and enjoy the countryside at low speed. Nothing wrong with that of course, but the Spax pair had finally showed their limitations under such difficult conditions. Of course this would have corrected itself the next morning, but at that exact point, on that road I realised that there was perhaps one last upgrade step I was going to be obliged to take.

I have run Ohlins on a Renault Sport Spider for years and their effect on the handling of the car was transformative. There's a reason why Ohlins are the *Choice of Champions*, they really are very good indeed. The Ohlins approach is very much on the side on controlled comfort for road setups and not only do they typically make the ride very compliant, but their control over a wide range of working conditions is entirely predictable, maintaining their performance at both ends of the scale. Moreover, they are very sensitive to adjustment and the balance of the Spider can be subtly altered by simply using the multi-click adjusters on top of the shock body. Stiffen the rear by a couple of clicks and soften the front by a similar amount and the move to oversteer balance is clear and obvious. Soften both ends for more controlled roll and weight transfer for a wet track day for example. Fabulous stuff, which I was certain would work similarly well on the tricycle too.

Other owners in the M3W universe had already pioneered the development of a kit for the Three Wheeler, so it was easy to make contact with the ever helpful folks at the Silverstone-based BG Motorsport to place an order for the latest specification Ohlins S46DR M3W kit. Made specially to

order (as I wanted stealth black springs, not the traditional Ohlins yellow – that *not-wanting-bling-on-my-tricycle* thing again I'm afraid), these arrived safely and I was able to fit them easily and quickly. They fitted my new 2020 chassis perfectly (my original 2013 version cracked in the upper front chassis rail and as replaced very efficiently by the good chaps at MMC in July) and I was again able to lower the spring platforms to drop the ride-height to the level I wanted.

The Ohlins dampers have 20 'clicks' of combined Bump/Rebound adjustment available, turned fully Clockwise (0 clicks) being FULL damping – turned full Anti-Clockwise (20 clicks) being MINIMUM damping. **I settled for 9 clicks out on my car**.

In terms of other geometry settings, I have achieved approx. 1.5° Negative Camber each side and Tracking is set @ 0.03' Toe-in each side = 0.06' Total Toe-In = 0.75mm. Caster is approx 5.5° negative each side.

In Summary – Ohlins S467DR M3W Kit

Beautifully made, easy to fit kit that measurably improves the handling over the Spax Adjustables, but transforms the handling when compared to the OEM standard fixed Spax dampers. I've not tried a car on the initial Suplex units, but I hear they were good too. But the Ohlins is pretty much the best in the business.

What do I gain?

On the road, the Ohlins perform as well as I had hoped. The damping performance is superb and the ride quality and wheel control outstanding. When the wheels hit a bump I see them move, but feel very little, such is the isolation now. Feedback through the chassis (and seat) remains excellent and the car now offers the confidence that I've sought for a long time. Clearly not a cheap 'fix', but well worth the effort and expense in my view.

Compromises?

Ok, this is another expensive option, but if you take driving enjoyment seriously, then for me the Ohlins route was the only way forward. Other high quality damper manufacturers off solutions for our cars as well, but I have had little experience of alternatives. I hear that ATR make some good kits and they are well reviewed – and a decent amount cheaper too I suspect.

So, journey's end as far as I am concerned – maybe I'll just drive the flippin' thing now ☺

*** END ***