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Power struggle

The 911 Turbo is the tuner's favourite because where there's boost there's power. The 997 Turbo has raised the stakes yet further and here are six of the best ranging from 600bhp to a mind-melting 730bhp. How fast? Well we've strapped on the timing gear to find out

The 997 Turbo is the all-weather supercar, capable of destroying Autobahns, B roads and racetracks on demand, while simultaneously offering the pinnacle of Porsche comfort and technology. But even with a car as potent as the 997 Turbo, once you've become acclimatised with its performance, there's always room for a bit more, especially when that little bit more is temptingly within reach. With the earliest examples now selling for nearly half of their original purchase price, and their original manufacturer's warranties coming to an end, the national fleet of 997 Turbos are attracting a new type of owner. The time seemed right to put a selection of upgrades to the test.



THE TEST:

We've come to the birthplace of the Harrier jump jet and the home of BBC 'Top Gear', Dunsfold aerodrome, for our test – a last-minute change from our usual Bruntingthorpe playground – sorry, test facility – on account of the diabolical weather we've been experiencing. That means we've had to limit our runs to 160mph (one car excepted) as the runway is shorter, but it meant we weren't spinning our wheels on sheet ice.

Getting a turbocharged four-wheel-drive car off the line isn't easy: too brutal with the clutch and you can damage drivetrain components; too meagre with the gas and you'll simply bog down off boost and then have to wait for the rush to begin. Thankfully, the 997 Turbo is remarkably strong; it's one of the few cars that can withstand repeated punishment of this nature. Nevertheless, with five out of the six cars present belonging to private individuals, we had to spare a thought for their owners' feelings and wallets. Repeated and determined full-bore starts just weren't on.

But we needed a level playing field, and to that end we decided to set a standard 0–30mph 'launch' time of 1.5 secs, applying it to each car's best 'run' of the day in the Racelogic software program to achieve our final results. Anyway, a glance at the data generated shows a spread of typical 0–30mph times, the best being around



1.4 secs, the poorest up around 1.6 and 1.7 secs – and that range is for every car present.

To show you just how meaningless these initial numbers are, the quickest launch of the day was achieved by the least powerful contender (Revo), and that was when I was supposed to be taking it easy – the time being more luck than good judgement and helped by the warmer surface temperatures earlier in the day. You'll also notice that, regardless of engine power, there's really nothing to choose between any of our cars up to 60mph – apart from the lightweight Cargraphic entry: it's only the 0–100mph figures that really start to show anything useful. As a point of comparison, ultimately – with just a driver onboard and no passenger – a perfect no-holds-barred launch in a 997 Turbo can go as low as 1.2 secs, while your archetypal mid-engined, rear-wheel-drive, 500bhp plus supercar will struggle to launch to 30mph in anything under 1.8 secs on normal asphalt (ie, not a sticky racetrack).

To add to our test, we've also taken a 50–70mph time in fourth gear and a 100–120mph time in fifth gear to get a handle on the engine's flexibility. Beyond that, it's good old-fashioned subjective opinion. Oh, and temperatures were just above zero degrees centigrade and each car was figured with two people aboard. Right, let the games begin...

TURBO TECH – TUNING THE 997 TURBO

Although they share the same basic engine, the 997 Turbo is a very different car to its 996-based predecessor in both character and technology, and if there's one thing that contributes to this more than any other it's the variable-vane turbos. Developed to improve the flexibility of turbo diesel engines, these are highly advanced pieces of kit, but

essentially what's happening is that, depending on a host of parameters, the size and angle of the housing adjusts to give the benefit of a small and responsive turbocharger at low revs and then a larger one at higher revs to provide lots of power. In this way, the dreaded drawbacks of turbo lag are minimised, and the 997 has ethereal punch at almost any time. However, for tuning purposes, this has made the car more complicated.

Although the turbine has been designed to flow more air at higher revs, it still acts as a restriction in the airflow and has been designed for a mixture of power and response between 2000 and 6000rpm, not for sheer horsepower with lots more boost. A by-product of this restriction is heat, and managing that air intake temperature seems to be the key challenge in tuning these cars.

That's why the GT2 has a trick intake manifold: it lowers the pressure but that also drops the intake temperature, as well. As with any turbo car,

heat is a constant enemy, and that's not helped by all the mechanical components being tightly arranged at the rear of the car in a 911.

Unlike the 996 Turbo, the 997 doesn't have any wastegates, but the boost pressure drops off at higher rpm as the turbine geometry changes, thereby handling the situation without any other intervention. Recycle-type diverter valves (or dump valves) are fitted on each turbo with the 997, not separate like the 996.

And what of those rumoured turbo failures? It's true, says Rob Young of DMS, but it was actually nothing like as serious as it sounds. Apparently, a tiny part of the mechanism that altered the turbine blade geometry was failing in the early days, and at the time there was no repair kit available – which there now is – so complete turbos were being replaced.

Overall, Young can't ever remember hearing of a 997 Turbo that's gone bang. These are very tough cars – great news for the second-hand buyer.

THE CARS:



Estimated power: 570bhp
(Revo ECU upgrade w/h exhaust: claimed 550bhp)
Estimated torque: 575lb ft
(Revo ECU upgrade w/h exhaust: claimed 560lb ft)
Price: £2049 + VAT
(for ECU upgrade only, including Select Plus switch)
www.revotechnik.com

The Revo car is the least powerful of our group – a baffling distinction when you consider it has the best part of 600bhp on tap. Looking stealthy in Atlas Grey, its owner, David Fyfield, has also fitted a Europipe exhaust including sports cats, which means we can only estimate the power and torque outputs (see above), but which has allowed Revo to make the most of its ECU work.

This level of tuning really is first base for anyone looking to make a 997 Turbo go faster, and it's certainly the most cost effective. But there's more to the Revo Technik upgrade than just a power increase. Revo will tune its upgrade to your individual car and tastes but, for an additional sum of £249 plus VAT, it will provide its Select Plus switch that gives the user three different levels of boost and mapping to choose from, as well as valet and anti-theft modes.

David's car might look like a sleeper, but there's nothing dozy about its acceleration. We're running the car in 'level 7' in a range running from 0 to 9 – the numbers above our setting chosen today are for higher octane fuel that you might find is available at a track day. That optimisation is the beauty of this



Tests like this mean short bursts of action followed by data perusal (left) and swapping timing gear over (below)

switch-able system.

As mentioned in our introduction, my best start in David's car is one of the quickest of the day, even if it's more luck than judgment. Naturally, David doesn't wish his driveshafts to be repeatedly hammered into submission but, even though I'm easy on the clutch and gentle on the revs, on one occasion everything hooks up just nicely and, without a hint of bogging down, we're off like a hare on the first of March. We spring to 30mph in just under 1.4 secs, nailing the 60mph marker in an incredible 3.4 secs – that's about the same as a Lamborghini Murcielago LP640, in case you're looking for a comparison. Even when adjusted with our stock launch time, that still equates to 3.5 secs to 60mph and an impressive 8.2 secs to 100mph, already well inside the factory time. More telling still is the 0–150mph time that leaves the factory car some 1.4 secs further behind.

Although I'd expected the Revo car to be the slowest on the day – which it was – the strength of its torque delivery was genuinely surprising. This was most noticeable through first and into second gear, where the car really squirmed around under full acceleration, and is also borne out by a stunning 50–70mph in-gear result of just two seconds dead and that great 0–60mph time. Perhaps retaining the stock smaller turbos and coupling them with better exhalation and new mapping gives particularly strong mid-range response at lower speeds, even though this car loses out to the others in a flat-out charge through the gears.

Overall, the Revo mapping keeps the manners of the standard car yet builds upon the

performance noticeably.

Thanks to the new exhaust there's a little more noise in David's car, but otherwise it drives just as a stock 997 Turbo does, and there are no nasty spikes or fluffs in the power delivery. Overall, it's very impressive; you won't want to drive a 997 Turbo without this upgrade once you've sampled it.

Contact: www.revotechnik.com



Claimed power: 592bhp
(quoted as 600PS)
Claimed torque: 575lb ft
(quoted as 780NM)
Price: approx £15,000
www.gff.de

This TR-60 is the first of two cars driven to the event over a day and much of the night by a couple of the gff lads, and looks suitably sinister in its all-black war paint.

The modifications on this car still leave the engine internals untouched, but there are new gff intercoolers, a full gff valved exhaust system – including stainless steel headers and 100-cell cats, plus a strengthened clutch, a new air filter and a reprogrammed ECU. At around £15,000 it's certainly not cheap, but gff has built a fearsome reputation for power since its formation in 2001 under boss Jan Fattthauer.

Fattthauer is a bit like his Porsche-based creations – he's different from the normal tuning fraternity, and I mean that in a positive way. Tall and softly spoken, you get the feeling he's not the sort of guy to make unnecessarily wild claims. He seems the opposite to much of the flashy tuning world, and his cars tend to live up to their promise while keeping their own look and character.

So, here we are on the launch pad. Raise the revs up and...thump! The TR-60 explodes forward, violently tugging the steering wheel in my hands and scrabbling furiously at the tarmac. It's an absolute animal. It has an exhaust bark that spears through the bulkhead and into your brain, and a torque delivery that is simultaneously exhilarating and bewildering.

Although I tell myself that a good deal of the feeling of speed is down to that tremendous noise, I just can't shake the gut feeling that this gff is quicker than any of the non-German entries. That's how it turns out in some respects. The figures back up my subjective opinion, the TR-60 positively ripping to 100mph in just 7.4



Evocative Martini striped EVOM's car is flanked by the Cargraphic (left) and DMS Automotive machines



The mighty 730bhp gff TR-74 flanked by gff TR-60 Turbo (left) and effective Revo Technik Turbo with 570bhp

secs and opening up a sensational gap on both the theoretically more powerful DMS and Evolution cars. It then goes on to post a highly credible 17.6 secs 0-150mph time, although by now the additional power of the Evolution car has seen it surpass the black gff. I would have expected the DMS car to have been at least on a par with it at 160mph if we hadn't had a technical glitch in the data.

That manic feeling of torque is backed up by the fastest 50-70mph time of the day, too – just 1.9 secs, a time equalled only by the Cargraphic car and a huge improvement over the standard car for such a brief incremental change in speed. Despite the mad rush of acceleration, the drivability of the car seems unaffected and it's well behaved on part throttle, or when repeatedly making small accelerative inputs. However, there may supposedly be a valve in that gff exhaust, but to me it still seems really loud most of the time. It's a great noise – louder and more musical than just about any Turbo I've heard – but while it would be great for a Sunday morning blast, personally speaking, I'd find it hard to live with every day.



DMS Automotive



Claimed power: 605bhp
Claimed torque: 620lb ft
Price: £9850 + VAT
www.dmsautomotive.com

The DMS car is, in many ways, the exact opposite in character terms of the black gff car. Company boss Rob Young estimates he's upgraded around 200 997 Turbos, most with a simple ECU remap and a freer-flowing exhaust system – and all the components are developed, tested and manufactured in-house at his Southampton base. However, the car he's brought along today (his own 997 Turbo and his second development car) goes a stage further, with larger turbochargers – still of

the variable-vane type – adding to the new stainless steel headers, 200-cell cats and stainless steel exhaust.

This is partly to take the 997 beyond the 600bhp mark, but also so that the DMS car can achieve those figures with the new turbine blades spinning at a lower rpm for the same level of boost. The benefit, says Rob, is less heat build-up at the turbochargers, to the benefit of long-term engine reliability and heat management during prolonged hard use on, say, a track day or such like.

However, this carefully considered philosophy hasn't resulted in a somehow 'sensible' car: the DMS 997 scorches to 150mph in under 18 secs and feels exuberantly powerful whatever the revs. It can't quite hold on to the Evolution car at higher speeds and, although a computer glitch over the final 10mph voided out our data from this point, our gut feeling was that it was beginning to reel in the TR-60 at high speeds.



Our man Towler at the wheel. A master of the standing start, even so getting the perfect launch from a 997 Turbo is a tricky job

But the real beauty of the DMS car is its ability to feel amazingly similar in manners to the standard machine – albeit with a sizeable dose of additional wallop. It's uncanny, but it really does feel like the factory car – the power delivery is perfectly judged and very smooth. And, despite the very slight increase in noise from the DMS exhaust system (which is a good thing as it sounds much better than the Dyson-like drone of the standard car), there's nothing to stop you using this car each and every day, which, to be honest, you'd be hard pressed to do with the noise generated by the

gff TR-60. There isn't even any noticeable diverter valve theatrics when you lift off the accelerator pedal, just a steady and relentless stream of amusing power.

On the public road it must be a devastating machine, as I can't think of anything short of the most extravagant supercars that can offer the same overtaking punch – and you'd hardly call them usable in the way a 911 is. For the additional performance, this DMS upgrade also appears good value for money, and the upgrade can be fitted in a day. Rarely has 600bhp seemed so bizarrely normal – or quite so tempting...

Cargraphic/RS Tuning Powerkit 4



Claimed power: 616bhp (quoted as 624PS)
Claimed torque: 609lb ft (quoted as 826NM)
Price: approx £35,000
www.cargraphic.co.uk

The Cargraphic upgrade arrives in the form of a 997 Turbo GT RSC 3.6 – and what a car it is. Imagine a 997 Turbo crossed with a 997 GT3 Clubsport and you have some idea of what we're talking about here. I lower myself into the bucket seat and survey the scene: much of the interior trim is removed. There's just simple carpet on the transmission tunnel, the doors are made from carbon fibre (but still with an ingenious side-impact protection system) and there's a roll-cage in the rear. Company founder



The EVOMs car produced big power from standard internals. The whole colour scheme is a vinyl wrap

Michael Schnarr reckons there's been about 150kg shaved from the standard car, and I have to say it's all beautifully done; there is carbon fibre absolutely everywhere. In fact, this car is not really a modified car, it's more like a completely new model, and there's far too much to list in the space we have here. Even the front wings are wider and, of course, they're made from carbon fibre, too. Overall, it feels superb – more like something Porsche would make itself than the work of a tuner, and I have an itch to take the car off somewhere and drive it that I mustn't scratch today. It's extremely good at the 'Ring,' says Michael, 'and then you can fetch your fresh bread in it afterwards.' Right. I think we all need a GT RSC in our lives. I need to drive this car again soon – and hard.

Anyway, what it does mean is that the times achieved on the day by this car must be viewed in the light of a car that weighs considerably less than every other car taking part, and in some ways that's a shame, because it muddies the water a bit.

Schnarr's demonstrator is the one car where I can really give it everything off the line, but I never quite manage to catch it right, or at least that's how it feels. Nevertheless, we still

manage to equal the 0–60mph time set by *Sport Auto* magazine of Germany, and used in Cargraphic's press material: a stunning 3.3 secs. To be honest, I reckon with just one person in the car and that once-in-a-lifetime getaway, you'd be able to shave a couple more tenths off that time at the very least. Which is quite a thought in itself.

As you'd imagine, the Cargraphic car uses its weight advantage to full effect, setting the second fastest time to 100mph at just 7.3 secs and rocketing on to a 160mph time of 19.4 secs. Its advantage is eroded at really high velocities by the big firepower of the Evolution car, but there's no denying the quality of the RS Tuning motor. Yes, that price tag does make us gulp, but its reputation precedes it and, on the day, this is a peachy engine: smooth in delivery but with a noticeable lack of a flywheel effect and great response. None of the modifications affect the internals of the engine, but there are new turbochargers, intercoolers, a full exhaust system, a new clutch and an ECU remap. It would have been great to have experienced this motor in a standard car for a true comparison, as our hunch is that it would have fared very well, indeed.

Evolution Motorsport's EVT700



Claimed power: 727bhp
Claimed torque: 753lb ft
Price: £18,000
www.evoms.com

And now to the big boys. You may have seen Nick Shave's 997 Turbo cropping up on various Porsche forums recently – and it's not surprising considering its outstanding, retro-inspired 'Martini remix' colour scheme. It's actually a vinyl wrap; underneath it's Basalt Black. Whichever way you look at it, it's not the sort of car you forget in a hurry.

Evolution Motorsport in the USA makes some pretty bold claims for its EVT700 kit, especially considering that the modifications still don't touch the internals of the 3600cc flat-six. In fact, I think it's fair to say that among the German tuning fraternity this has been somewhat controversial, with certain comments passed as to both the truth of the figures and the expected longevity of the engine.

Regal Autosport, in Southampton, fitted the upgrade, and says it has tested Nick's car to the limit without ever experiencing any reliability



The gff TR-74, also dubbed 'The Egg' thanks to its white/yellow paint job pulled 0-180mph in a mad 22.5secs

problems. It also says it has gone fairly easy on the torque curve through the engine's mid range, although a peak on the graph shown to us of 753lb ft is, frankly, a simply outrageous figure that threatens to roll the asphalt from underneath the car like a carpet.

Evolution has designed a larger compressor wheel for the variable-vane turbochargers and refitted them with its own design of diverter valves. New intercoolers and an Evo exhaust including headers and cats complete the upgrade, along with the obligatory ECU remap.

So, does the EVT really crank out the kind of mojo its makers claim? Well, we'll leave it to you to scan the performance figures to decide, as we have no definitive way of testing for the exact numbers. However, what's clear is that it does enjoy a definite power advantage over the other cars – gff TR-74 excluded.

We manage a sizzling 1.4 secs to 30mph launch in the American-tuned car but, even adjusted with our stock launch time, that's good enough for a 0–60mph time of just 3.5 secs. And although the DMS car matches it to 100mph – perhaps a sign of the restricted mid-range torque on the EVT700, a theory backed up by its only average in-gear times – the EVT700 then gets into its stride and pulls out a significant advantage by 150mph, sailing past the gff TR-60 in the process. It even starts to chase down the lightweight Cargraphic car. Remember, that car had nearly a 1.5-second advantage at 150mph, but the gap has been slashed to just three-tenths by the time they've reached 160mph. Once it's up and running, the Evolution car absolutely flies.

In spite of its prodigious performance, driving the EVT700 is still not a great deal different from the standard car. Noise levels are reasonable; only the pronounced 'tishhh' from the new diverter valves betraying the considerable extra poke available from the engine. It's a pity, then, that under sustained

acceleration a slight pulsing could be felt in the power delivery. Regal says this is the engine running close to the torque limits set by the ECU and that it is still working on refining the mapping still further, but it does detract a little from the smoothness of the power delivery and reminds you that this engine is working right at the limit of its capabilities.

gff TR-74



Claimed power: 730bhp
Claimed torque: 715lb ft
Price: approx £50,000 plus VAT
www.gff.de

With a nickname it 'The Egg' because it's white with a dash of yellow on it, but the only scrambling going on around here is in my brain once I've experienced the gff KR-74. Let's be clear about this: there may be two cars touting big 730bhp-ish power figures today, but in reality there are five cars in one test, and then there's 'The Egg' in another. This thing is on a different level for outright acceleration.

The reasons are plain to see. It is the only car here to feature an engine that has had internal

surgery to fill it with stronger components: gff fits stronger connecting rods, and machines the cylinder heads before reassembling with wilder camshafts. Then it throws the variable-vane turbos in the bin, replacing them with a pair of larger, traditional fixed-geometry gff '750' turbochargers to handle more boost at higher rpm. To that package are applied all the same external upgrades that the black TR-60 car has – gff exhausts, intercoolers and so on. The result, claims gff, is 730bhp and 715lb ft of torque. The price tag is on another level, too: around £50,000 plus VAT. Phew...

Predictably, binning the variable-vane turbochargers means losing the one thing that makes the standard 997 Turbo such a devastating road tool: its outstanding mid-range flexibility and response. That's not to say that this gff is a dragster – a straight-line machine and nothing else – because it still picks up well once on boost and it is still – and this is the crazy bit – easy enough to drive that you could give the keys to your gran. But the figures tell the tale: it lags noticeably behind every other car in the 50–70mph in-gear test, and that gap would have been further still if we'd have simply measured 50–60mph. At those rpm, 'The Egg' was dozing. And then...

It's desperately hard to adequately describe the feral rush to 7000rpm, but it's like every in-car 956/Group B turbo-fed fantasy you've ever had. That rev counter needle positively rips round the dial to '7', and it's hard to even take your hand off the gear lever through the lower gears. So, how about an imaginary drag race then? We'll ignore the Bugatti Veyron because it's an alien life form amongst cars and bring on instead that immortal yardstick, the McLaren F1. We'll also throw a seven-litre Pagani Zonda S into the mix to represent a 'slightly' more normal supercar. 'The Egg' destroys them to 30mph, as you'd expect with the benefit of four-wheel drive, but then is as good as level with the Big Mac at the all-important 100mph marker. That in



Cargraphic's lightweight 997 Turbo was much more than just a turbo conversion and more of a track car

997 Turbo test figures

	CARGRAPHIC	DMS	EVOLUTION	REVO	9ff TR-60	9FF TR-74	STANDARD
0-60mph	3.3	3.6	3.5	3.5	3.6	3.4	3.8
0-100mph	7.3	7.7	7.7	8.2	7.4	6.8	8.4
0-150mph	15.5	17.9	16.8	18.4	17.6	14.3	19.9
0-160mph	19.4	N/A*	19.7	21.8	20.6	17	N/A
0-180mph	N/A	N/A	N/A	N/A	N/A	22.5	N/A
50-70mph 4th	1.9	2.2	2.2	2	1.9	2.5	2.3
100-120mph 5th	2.6	N/A*	2.5	3	2.7	2.2	3.5

* Data error

Standard car: times from a press 997 Turbo figured on another occasion but adjusted with standard 1.5sec launch time and provided as a comparison

itself is a revelation, but by 150mph the TR-74 is still gamely clinging on to the low, light, Woking hypercar, only an amazing 1.5 secs adrift. The gorgeous Zonda has been utterly annihilated, nearly two seconds further back.

We called it a day at a 'comfortable' 160mph in all the other cars, but with the TR-74 it was clear a 180mph run was feasible, even if it meant popping a brave pill or two. The result: 22.5 secs from 0-180mph. Incredible. What we have here is a hurricane on wheels. It is insane. It actually manages to make Dunsfold runway appear quite confined; on the road it must be like trying to drive an F1 car down an aisle of your local supermarket.

Conclusion

'Aren't 997 Turbos brilliant!' as Paul Whitehouse would say, and this test reaffirms those thoughts. Just like the original 930 911 Turbo

some 35 years ago, it is a car for all types of driving – not a hardcore track car – and the latest 997 version has been designed to be better than ever at that unique form of multi-tasking. However, the technology developed to further that cause brings its own challenges for the dedicated tuner, as we've attempted to explain.

The most cost-effective upgrade is the remap and exhaust combination, and it also provides perhaps the biggest lift above standard unless you're into spending major money. Having driven a 997 Turbo thus upgraded, I can't imagine running one in the standard form, and you never know – at this level you might be able to convince your local OPC to look the other way when it comes to warranty matters. The Revo car was mightily impressive and, on the strength of the DMS stage two car, its similar basic upgrade is also well worthy of consideration.

Beyond that, the options are tantalising and

almost ridiculously exciting, tempered by the size of your bank account, as is almost always the case. It's worth considering, though, that all these cars have a different character, and when choosing a path to take it's worth asking some major questions about what kind of car you want to end up with, how you will be driving it – and where?

But we'll save a final word for the gff TR-74. Yes, it's an extravagance – and an expensive irrelevance some might say. And yes, it's flawed on a twisting British road. But if you want a maximum hit of adrenalin, short of throwing yourself off the roof of a tower block, there is no substitute for a fix of 'The Egg'. It's a bad, bad car, in the best possible meaning of the word. 

Number crunching

Many thanks to Race Logic for its help with this feature. We used the handy Performance Box, which is effectively a high-performance 10Hz GPS engine which measures speed, position, G-forces, lap times, split times and more. It logs data to a MMC flash card, which can be analysed in detail using the PC software provided.

The unit itself simply attaches to the inside of the windscreen, much like a sat nav. It has an LCD screen for instant read-outs, so you don't need to download to find out the time for each run. It was perhaps no surprise that both the Cargraphic and gff boys all arrived with this Race Logic kit fitted to their cars.

For more info, contact: www.racelogic.co.uk

