There's nothin' I can't do with a race car

So, here we are again. *There's nothin I can't do with a race car – part three*. Sit down, buckle up and get reading, we've got a lot to go through.

In fact, we've got so much to go through that, rather than kicking things off with some big, long-winded introduction to the build again, I'm just going to recap the basics for anyone out there who missed the last two issues and, as such, missed parts one and two of TNICDWARC (wow, how's that for an acronym?) The car: my Mk5 GTI. The plan: to improve every area of performance possible with the help of tuning legend, Regal Autosport. Did I mention I'm not quite sure how I got this far in the first place?

Words: David Kennedy
Photos: Paul Watts, Matt Woods, Regal Autosport

Forge Twintercooler

I think it's safe to assume that if you have been reading *PVW* for a while now, you'll have a pretty good idea of what intercoolers do on turbocharged cars. Put simply, an intercooler's job is to cool the air as it passes between the turbo and the engine. When the turbocharger compresses the air, it condenses it and, when compressed, air heats up. And as we all know, hot air isn't the best thing for efficient combustion.

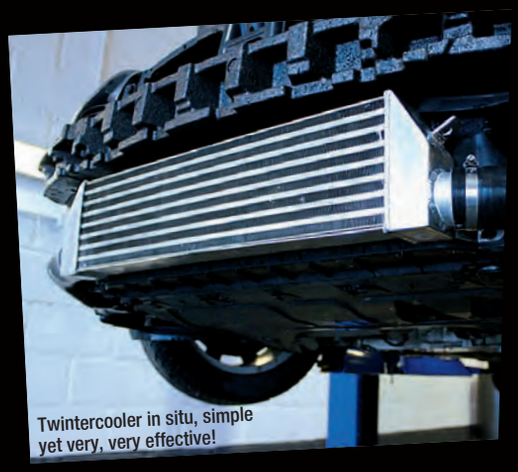
It's the reason your car might feel a little slower on scorching hot days and why people always talk about cars performing better on colder days. So, by cooling the air back down after it leaves the turbo, it becomes denser, meaning you can get more of it into a set space. The result of this is that more air can go in to the cylinder at each piston cycle and, when mixed with the correct amount of fuel, will yield more power. I know, it's probably quite clear by now that I didn't pay much attention in my physics lessons at school but, well, those are the basics. So with that in mind, it stands to reason that the more efficiently your intercooler setup performs, the more efficiently your engine can work. After all, as with most things, an engine is only as strong as the weakest link in the chain. It doesn't matter if you've got the biggest turbo in the world bolted on out back, if it's pumping boiling hot air into the combustion process, at best it won't work too well and, at worst, it won't last long at all.

PART THREE

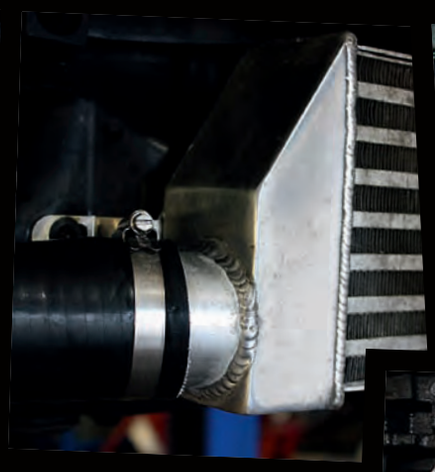
Not good, I'm sure you'll agree. Which is why, when considering any kind of performance mods to your turbocharged engine – from a simple remap to the kind of spec I'm dealing with here – fitting an intercooler is not just a good idea, it's absolutely vital.

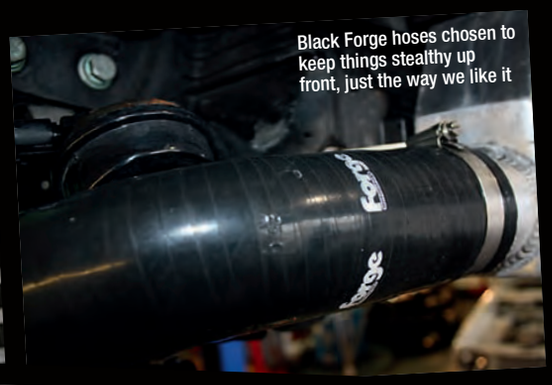
And I don't know about you but for me when it comes to intercoolers, Forge Motorsport is the first name that springs to mind. But this isn't just an intercooler, it's a Twintercooler. Yep, that's right, a Twintercooler. No, it's not a misspelling on our part, that's what it's called. And for a good reason too. You see, most intercooler setups have one core, which is all very well and good but the clever chaps at Forge don't just stick with well and good. No, you don't become one of the leading tuning brands in the world by sticking with the status quo. You see, Forge's Twintercooler uses a twin-core design, hence the name.

This means that it is far more efficient at cooling the air passing through it which, in turn, means that the engine can work even more efficiently than with a standard, single-core setup. In fact, in testing Forge found that the twin-core design saw greater efficiency throughout the rev range from top to bottom, while the specially designed end tanks saw increased flow rate through the 'cooler. And by pairing the Twintercooler with the standard, factory intercooler, Forge



Twintercooler in situ, simple yet very, very effective!





Black Forge hoses chosen to keep things stealthy up front, just the way we like it

"In testing Forge found that the twin-core design saw greater efficiency throughout the rev range from top to bottom, while specially designed end tanks saw increased flow rate"

not only saw an increase in power and torque but a huge reduction in inlet temperature up to 20 degrees Fahrenheit, from 102 to 82 at 6600rpm on a standard car, but increased flow efficiency too. You'd be forgiven for thinking that with all that going on, fitting it to the car would be a nightmare involving cutting bumpers, fabricating brackets and general headaches; but as is always the case with Forge products, things couldn't have gone smoother. Designed to be a true, bolt-on kit, fitting the Twintercooler is about as simple a job as they come. And with all the relevant hoses and mounting hardware supplied in the box, hooking it up was about as drama-free as you can get.

And as I spec'd my Twintercooler to come without any Forge branding on the front and with black hoses, it really is a stealthy-looking bit of kit. But, of course, it can't just look the part, it's got to do the job too. And well, it goes without saying that it does this just perfectly. Without going all Ronseal on you, the Forge Twintercooler does exactly what it says on the tin and really, what more could you ask for than that?

SuperPro Bushes

Like the clutch kit over the page, uprated chassis bushes are another one of those products that, although you can't really see them, make one hell of a difference to how your car performs. The standard, factory bushes are made from a hard, rubber substance. Although this does the job just fine for most, it can definitely be improved on. This is done by simply replacing the OE rubber items with aftermarket polyurethane bushes, a much tighter and stronger material indeed. If it sounds simple, then that is because it is (on paper). Fitting polyurethane bushes means you're tightening up every connection in your chassis, removing the minute amounts of play that although may seem small, can add up to something much bigger when all brought together. And when it comes to polyurethane bushes, one of the biggest names in the game is SuperPro. SuperPro is an Australian company backed by over 30 years of automotive industry and motorsport experience (in the form of parent Australian company, Fulcrum Suspensions). It certainly knows its stuff when it comes to tuning up your chassis.

Fitting the complete SuperPro bush kit may seem like quite a big job when you're sat looking at a big pile of individually bagged polyurethane bushes but believe me, it's worth the effort. SuperPro bushes don't just offer a stiffer chassis but better road-holding, more responsive steering, constant straight line steering geometry, improved tyre life and, to top it all off, longer service life of suspension components. Basically, it's a win, win situation. But there's yet more to it... SuperPro bushes remain constant in their durometer (or hardness), even under the most adverse conditions. In contrast, standard rubber bushes increase in durometer when compressed, lowering their ability to perform correctly. It's all to do with the resilience of the SuperPro bushes and their ability to return to their natural shape after compression, which allows the control of noise, vibration and harshness (NVH) in a car. One of the other benefits of fitting bushes all round is the fact that by replacing the old, worn OE bushes, any age-related issues in the suspension components caused by the rubber bushes are also cured.

So, with all that in mind, you can see why I wanted to fit the complete set to my car. After all, there would be no point having brand new top-spec coilovers and the latest in LSD technology if the standard rubber bushings let the side down. The kit I spec'd up from SuperPro was its 'track' specification kit, which would be more suited to my car and contained pretty much every replacement bush I needed, comprising: a Front Control Arm Lower Front Bush Kit; a Front Control Arm Lower Rear Bush Kit; a Lower Engine Mounting Torque Insert; a Rear Upper Control Arm Inner Bush Kit; a Rear Upper Control Arm Outer Bush Kit; a Rear Lower Toe Control Arm Inner Bush Kit; a Rear Lower Front Control Arm Outer Bush Kit; a Rear Lower Rear Control Arm Outer Bush kit; and a Rear Trailing Arm Front Bush Kit. In total this added up to 25 bushes, along with all the associated steel tubes, shells and washers required. Being the 'track' spec kit, it came complete with an offset bush that increases caster angle in the Front Control Arm Rear Bush to improve straight line stability and to offer an 'anti-lift' effect, a normal mod for track use but also pretty handy for fast road use.

Not only that but the Engine Torque Mounting Bush and the Rear Trailing Arm Front Bush were replaced with tighter ones more suited to motorsport use. SuperPro does make a point of stating that this particular bush upgrade is only really suitable for the track, as it may increase vibration (something its regular bushes certainly do not do), but as I was going full-on anyway, what's a little vibration between friends?

Of course, the real test of a product's quality is in the fitting and fitting the SuperPro bushes was a breeze. Sure, it took a long time to swap out every single standard bush but that's just part and parcel of installing super tough polybushes. So, do they really make any difference? Well, yes actually. And believe me, having never had a car with upgraded bushes before, I wasn't too sure if I'd actually notice any difference behind the wheel as the Mk5 chassis is so good stock. Well, I'm not embarrassed to admit that I couldn't have been more wrong. How do I describe it other than saying they don't just make the car feel like a new car, they totally transform its characteristics. Everything just feels more together and sure-footed and even though I'm not always driving around at 10/10ths, you can certainly feel the difference in the way all the elements of the chassis feel more connected to each other, without it being crashy or uncomfortably stiff. It's funny really, the bushes arrived in the smallest box out of everything I ordered for Project Beauty Skool Drop-Out but in terms of how big a difference they have made, let's just say they punch well above their weight. In fact, I really can't see how you could go wrong with a set and as we all know, when it comes to modified cars, it's not often you can say that!

Bushes may look small but make a massive difference to how the car feels

Lightened flywheel isn't just vastly stronger than the stock dual mass flywheel but lower mass allows engine to rev more freely and much quicker too. Win win, win!

Sachs coilovers look the absolute business both on and off the car

ZF Sachs Clutch

"You'll need yourself a proper clutch setup too, if you're going for more power," Paul at Regal told me last summer. "The factory one won't be up to the job at the level you want to run at." Well, as I was going for significantly more power than the ol' girl left the factory with, I thought I'd better follow his advice and get myself sorted in that department too. After all, there was no going back now.

Previously, when I had my Bora, one of my first performance mods was a ZF Sachs clutch kit. After experiencing nothing but good things all the while I owned it, and after hearing all the positive reviews on the kit in the 2.0-litre TFSI application too, the decision to pick one up again pretty much made itself. The best thing about the Sachs clutch kit, in my opinion at least, is that it copes with a whole heap of extra power and torque with ease and it does this whilst feeling totally OEM. You would be forgiven for thinking that if the clutch is designed to put down vastly increased power figures to the road time and time again, it would have to be a great big, stiff, heavy thing to use; a nightmare if the car is a daily. Not so with the Sachs clutch though. Comprising a rigid organic drive plate and critically, a lightened flywheel, the clutch is more than capable of handling whatever I can throw at it. But, at the same time, it doesn't feel any different to the standard clutch. Pedal feel is virtually OEM and repeated use whilst stuck in traffic doesn't leave you with a massive, muscle-bound left leg either, something I recently tested to the limit by getting stuck in almost five hours of traffic!

It's funny when you think about it. Once you've fitted it, you will never see your clutch again. And unless you put a big Sachs sticker on your rear window, nobody will even know you have it. But for something that spends it's life hidden away, quietly doing its job, it's one of the most critical parts of how the car feels to drive on a daily basis and really, if you've got a lot of power, one of the most critical things in general especially if aggressive launches are your thing. I guess the fact that after having a Sachs clutch kit in my Bora before getting another for my Mk5 says it all really. It was a revelation in the Bora and although the Mk5 couldn't be any further removed from the what the Bora was, both have considerably more torque than standard and the clutch impresses me in just the same way. I guess the ultimate test is, would I buy another if I had to? You betcha.

ZF Sachs Coilovers

Coilovers or air-ride? Considering the whole point of this project was to build a car that could really, and I mean *really*, be driven, there was only one option in my book: coilovers. But not just any coilovers; I decided that if I was really going to make the most of what I had, they had to be good ones. While the car may have looked the part on the FK Silverlines it sat on when I bought it, a closer look revealed all kinds of problems. With both fronts leaking out fluid like it was going out of fashion, and one side throwing some serious side-to-side play into the mix, it was safe to assume they were well past their best. But what to replace them with? After all, you don't need me to tell you just how important a decent suspension setup is, not just for handling, but for looks too.

Now, think of the name ZF Sachs and what do you think of first? Well, if you've been paying attention, hopefully clutches! But then I did some research; it turns out that Sachs also produce its own coilovers. But not just any old coilovers, these are something very

Prices

Price-wise, the ZF Sachs coilovers retail at £1379.16 while the clutch and flywheel kit comes in at £1241.09. The complete SuperPro kit (as fitted to my car) will set you back £534.34 and the Forge Twintercooler comes in at £615.64.

Contact/Price

www.forgemotorsport.co.uk – 01452 380999
ZF Sachs – www.racepads.co.uk – 01748 831200
SuperPro – www.superpro.eu.com – 01823 690281

Once again it was the good guys down at Southampton's Regal Autosport who got their hands dirty and fitted everything to my car. If you like what you see here, then give the guys a call on 02380 558636 and for full details of the products and services Regal can offer, log on to: www.regal-auto.co.uk

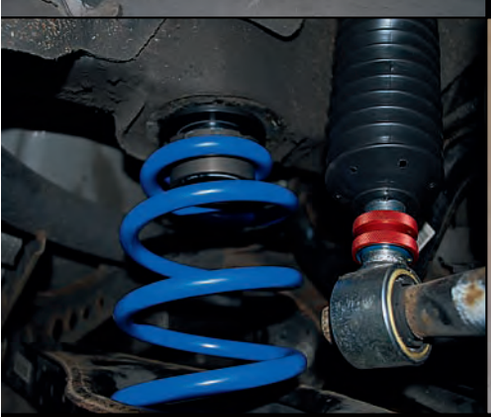
COMING NEXT MONTH

The end is in sight as we hit Regal once again for another box of goodies. You think I'm done yet? Not even close. Next up we'll be looking at exhaust and intake systems and should everything go to plan, much much more besides. Stay tuned kids!

special indeed. Well, after hearing so many positive things about them from both racers and road-goers, I didn't need to be told twice. But what makes them so special? After all, coilovers are coilovers, right? Er, no actually. The Sachs coilovers are a serious bit of kit, make no mistake about it. The most interesting thing about them is the upside-down monotube with gas pre-loading design of the dampers, front and back, a move that saves unsprung weight and allows for optimum damping performance. And that's not all they've got going for them. The Sachs coilovers feature two adjustment parameters, meaning that rebound and compression damping can be adjusted via a 20-step dial. Having so much adjustment may seem a little baffling at first but it means that you can adjust your coilovers, via a bypass on the piston, for all kinds of different driving environments, weather conditions and even tyre types and pressures. So they will always be at their best, whether you're out on track, on the drive to work or battling the snow and ice in the depths of winter. Of course, they wouldn't be coilovers without a decent range of height adjustment, and with 60mm to play with, they don't disappoint in this area either. And when I said they were a quality product, I wasn't exaggerating. From the bright blue, motorsport-grade springs to the stunning chromium-plated rods, they certainly look the part. With optimised, high-quality friction bearings and seals, OE-tested seals, bearing and piston systems and top-level corrosion protection, not forgetting the trapezoidal threading on the height adjustment collars to resist dirt, you know what you're dealing with. And it goes without saying, they are fully TÜV approved too.

So what are they like to drive on? I mean, that's what counts after all. Well, what can I say, other than just simply 'wow'. Really, they're that good. They aren't just different to the other coilovers I've experienced... they're in a different league altogether. Even on the old 16" ditch-finder rubber, they just feel right. And that's on a fairly basic setup too, as I wait for some warmer, drier weather to arrive before I really start playing with them. Firm without being too firm, stiff without being too stiff and comfortable enough without being soft, I couldn't ask for a better all-round setup. I didn't think a set of coilovers could make so much difference to how a car performs but well, consider me proven wrong. And you know what, I've got a feeling that they are only going to get better as I learn how to fettle them to my tastes. It's been said by those in the know that ZF Sachs doesn't do a lot of promotion when it comes to its coilovers, the German chassis guru prefers to let people discover just how good they are for themselves. So, please, do yourself a favour and check them out. I absolutely guarantee you that you won't be disappointed.

They aren't just different to the other coilovers I've experienced... they're in a different league altogether



Sachs coilovers bolted on without any drama or problems, look great under the arches and have transformed the car's handling and performance too. What more could you ask for?