THE ULTIMATE TEST

How much difference do performance parts really make? Can you really improve on what manufacturers spend millions developing? We tune a Focus ST and take it to the Nürburgring to find out

Words: Stav **Pics:** Chris Wallbank

As many of us are aware, tuning is still frowned upon by some people, almost always with the argument that the manufacturers have spent millions of pounds developing a car with incredibly high tech equipment, so how could a bunch of normal people with low budgets truly improve on that? To be perfectly honest, the argument is ridiculous, as manufacturers work to huge price, noise, and comfort restraints – things people like us who use cars for performance and fun rather than just commuting, are happy to sacrifice to some extent.

The second argument is that if you want a faster car, you should just buy something that does the job from the factory. Again, this argument is simply not true. Granted, randomly bolting bits onto a 1.2ltr Corsa and expecting it to chase Evos is never going to happen, but if you put some thought into it, you can even build a Veyron beater for an absolute fraction of the cost if you so wished. Although we didn't plan to beat a Veyron, we did want to show that tuning a performance car is well worthwhile. To do so, we chose a modern hot hatch and selected some simple bolt-on upgrades that are designed to improve the dynamics. Then we took it to the 'Ring...

Our tuned Focus ST waits to do a hot lap of the Nürburgring

Our objective

The mission was simple: to show you the amazing changes you can make to an affordable used car with relatively simple tuning upgrades. To do this we decided to conduct the ultimate test; take a standard hot hatch and with simple bolt-on tuning upgrades turn it from a good, but unremarkable car, into a real weapon in the hardest test you can ever give a car, the Nürburgring.

The plan was to drive it across Europe to the Nürburgring, test and time it at the 'Ring against a standard model, then drive it all the way home again. Not only did we want to see what improvements our tuning work made, but we also wanted to see what is more effective – driver performance or car performance, by getting a professional Nürburgring race instructor to test the car himself and give the rest of us some lessons on how to drive the 'Ring. It was a tall order, but read on to see the amazing results of the test.

"The Nürburgring is the ultimate test of any performance car"

Above The cars, before we gave them a damned good thrashing!

Left Stock ST interior is a pleasant, well equipped place to be

The standard car

Our standard test car was a white Mk2 Ford Focus ST, a front-wheel drive hot hatch with 221bhp coming from a turbocharged five-cylinder engine. At 2.5ltrs the engine is quite big, but so is the car; in fact it is one of the heaviest hot hatches ever made, at around 1400kg, the same as the R32 Skyline GT-R, and nearly double the weight of early hot hatches.

Despite the power giving good performance times of 0-60mph in 6.7sec and 150mph top speed, the weight is quite a hindrance when it comes to handling. Although the standard Nürburgring lap time of 8 minutes and 51 seconds is faster than the Mk1 Focus RS, we had a mammoth task on our hands.

The standard car was certainly a great performance all rounder, but in an effort to make it very refined and attractive to a wide audience, it is quite softly sprung and has a very progressive power band that almost feels normally aspirated, and dare we say it, boring. This car is good, but simply isn't hardcore enough for tuned car fans. It was time to give our ST more Focus *(see what we did there? – Dav)*

THE STANDARD CAR

We chose this ST as it is totally standard and owner Mick is a regular at the Nürburgring. It's the face lift model, but essentially the same car as ours.

The tuned test car

We chose the Focus ST as it's a popular hot hatch with a highly tunable 2.5ltr turbo engine. With early cars starting at about £8,500 it's attainable, and makes a good proposition for tuning. This orange, 55-plate car belongs to Richard Good, MD of KW Automotive UK and has 69k miles on the clock. It came fitted with their fully adjustable Variant 3 suspension kit, which had been specifically set up ready for the Nürburgring. KW are regulars at the 'Ring and test all of their new products there, including the latest Focus RS kit. Aside from that, it was pretty much stock.

We wanted to use parts that are widely available, easy to fit, well priced, and most of all, effective. To haul the car down from speed quickly we fitted an AP Racing 4-pot big brake kit to the front. To improve grip we fitted Toyo R888 road legal track tyres. We mounted the tyres on Team Dynamics Pro Race 1.2 wheels to reduce unsprung mass and aid brake cooling. Finally, to improve performance we fitted a full turbo-back Milltek exhaust system, Code:Red enclosed induction kit, and Code:Red ECU remap.

LAP TIMING

We've had a VI Monitor on test for a while now, and the trip to the 'Ring was the perfect opportunity to test it out.

The VI plugs into the ODBII port on your car and gives you an onboard display of the car's major functions while also being a performance meter giving you lap times, G-forces, and more. As well as using it to measure our lap times, it indicated the ST's major weak point, the intercooler, as the inlet temperatures were huge, which is bad for performance and reliability. Without this kit we would never heave realised this was happening.

If you want to keep an eye on your car's engine and performance, the VI Monitor is a vital bit of kit. Check it out at *www.vi-performance.com*

Initial post-tuning driving impressions

Due to time constraints, we fitted the parts over the space of two days at our workshop, rather than try and do it all at the Ring. First to be fitted was the KW suspension, full Milltek exhaust, and AP Racing brakes. Once fitted the exhaust certainly sounded nice, emphasizing the ST's five-cylinder warble, though still quiet enough to use daily, and the burbling and pops on the overrun sure livened things up.

The suspension was a surprise in a similar way too, as it certainly wasn't the bone jarring ride you might expect, and though it was stiffer than standard, even on the bumpiest of roads it would be perfectly acceptable. The fact that the KWs are fully adjustable for bump and rebound makes a huge difference to the ride and we were seriously impressed with their performance on the road.

The brakes were hard to test fully on the road, but they worked well from cold and had a nice progressive action. They also looked fantastic, so got the initial thumbs up.

Next up was the induction kit and remap, and wow, what a difference! The Code:Red remap doubled the boost to around 1.2bar (17.5psi) peak and also massively increased throttle response and low down power, giving the car a huge surge of torque at any revs, transforming the drive. The remap combined with the induction kit and exhaust gave an estimated 290bhp over plus a huge 340 lb/ft of torque, and it sure felt like it. The only issue the newfound power gave was huge wheel spin. Full throttle spun the wheels in second in the dry and fourth in the wet, making the car a monster at higher speed straight line stuff, but a bit useless coming out of damp corners, oh dear!

The final upgrade were the Team Dynamics Pro Race wheels and Toyo R888 tyres, and thank God we added them! When we swapped wheels we noticed the new ones were substantially lighter than the standard rims, but most of all, the new tyres were awesome. Despite being exactly the same size as the standard tyres, the R888s gave it almost full grip even in first gear in the dry, and surprisingly, considering their reputation for being a handful in the wet, they felt very composed, even in second gear in the wet. A huge improvement from the fourth gear wheel spin we got with the standard tyres gave.

The final test before taking on the 'Ring was the 200 mile journey loaded with luggage from *Redline*

Above We got this ace shot by strapping our snapper to the roof

Right An early morning thrash; better than any coffee to wake you up

Disaster strikes!

After almost 500 miles we were almost at the hotel when a very odd noise appeared, a high pitched "wa-wa-wa-wa-wa" noise, which seemed to be coming from the cam belt area. Arse. Our first thought was a whining cam belt tensioner, and considering the ST was coming close to it's usual cam belt replacement time, we feared the worst. A quick call to Gary at Profile Automotive in England and some phone based diagnosis and it turned out to be a split diaphragm in the oil breather system. It's a very common fault on Focus STs, especially earlier models, and is actually a Ford warranty recall. However the problem can still be as fatal as cam belt issues if driven hard, but thankfully it is far easier to fix. A few phone calls, a trip to collect the parts from 100 miles away, some borrowed tools, and some dental floss (honestly), and it was fixed and ready for action. If we'd known of this common problem before we left we could have swapped it for a new one to make sure we were safe. Always bear in mind when tuning; any extra stress will highlight the weak points of the car, so it is well worth asking a specialist tuner, or checking on a car forum who specialise in your car, to find out.

HQ to Dover, then 250 odd miles across Europe from Calais to the Nürburgring. The ST was comfy and easy to drive on the long journey at all speeds, gripped, stopped and handled well. Reliability was 100 percent too, while speed bumps and even the huge ramps coming on and off the ferry gave no rubbing problems, things were looking good!

One thing is for sure, even before we hit the 'Ring we learned a valuable lesson: improving one area of the car often highlights a weak point in another, in our case the extra power and braking ability showing the weak point of the standard tyres. What else would we find out on track?

The Nürburgring

The Nordschleife isn't like any track you may have experienced before. It's more like all your favourite driving roads in one, but, non-stop for 13 miles, with over 70 bends, and no oncoming traffic! The 'Ring is a roller coaster of jumps, blind crests, huge uphill and downhill sections, tight bends, 100mph+ sections, and banked corners. Combined it makes just one lap the equivalent of a hard 20 minute session at your average UK trackday.

A car that can take all you can throw at it on UK roads could easily destroy its brakes, tyres, and overheat, in a single lap of the 'Ring; it really is the ultimate test for a car. Anyone who can lap in the 10 minute area should be pretty proud of themselves, (although don't forget, timing isn't allowed during public track sessions).

We'd recommend taking your car to a UK trackday first to make sure the engine, tyres, and brakes can take a pounding on a 20min track session. Go to *www.javelintrackdays.co.uk* for dates and more info.

The test...

At the 'Ring we met up with *Redline* reader, Mick Clark, a Nürburgring regular based in Germany, who happens to own a 100 percent standard and almost new Focus ST, the ideal car to compare our tuned version to.

We also met up with Dale Lomas from RSR Nürburg, an instructor and veteran of the Nordschleife (who in fact holds the 6th fastest lap ever of the 'Ring on a motorbike). Dale was going to give his opinion on the car, set a lap time, and also give Mick some tuition from the passenger seat to see how effective knowing how to drive the track is compared to just tuning the car.

There was no way we could conduct the test on a public track session, as aside from other traffic getting in the way, it's illegal to time your laps. Fortunately, we managed to persuade the Nürburgring to let us use the track exclusively for one hour. We timed the cars from bridge to gantry, which is the standard used by most people at the Ring. So all we had to do now was pray that it would stop raining...

Above top The stock ST couldn't keep up with our tuned car

Above The Karussell tested the ST to its absolute limits

BRIDGE TO GANTRY

You've probably heard the term "Bridge to Gantry" (B to G) used when talking about Nürburgring lap times. This refers to a lap timed from the footbridge a hundred meters or so after the end of the main entrance, to the gantry near the start of the main straight. This takes 20-30 seconds off a car's lap time (depending on their straight line speed) in comparison to a full lap, so be sure you know if it was a B to G lap or a full lap when you are comparing times.

Standard ST around the 'Ring

The first job was to see what Mick's standard ST was like around the Nordschleife. Once on track you can really explore the limits of the car like you never can on the road, and the limits are surprisingly high, especially considering the weight.

There were no particular weak points on the ST; it doesn't under steer badly like many front-drivers, it feels quite planted despite fairly soft suspension, has good brakes and acceleration. On the steep climbs the temperature gauge stays steady, and the brakes and tyres survived the lap no problem; a lot more than you can say for many cars!

The weight combined with the suspension does slightly unsettle the car and make it go light when driving it really hard, but nothing remarkable. With pro Nürburgring drivers managing an 8min 51sec lap, and Mick himself putting in consistent low 10min laps, the standard ST is clearly a capable car. But with some well chosen upgrades, how much quicker would our ST be around the toughest track on earth?

Mick's opinion on our ST

Name: Mick Clark **Age**: Over 30 **Occupation:** I'm in the armed forces

"I couldn't wait to drive the ST as soon as I laid eyes on it, the lower suspension and Team Dynamics wheels make it look great, and having been thinking about tuning my ST ever since I bought it, I was keen to see the difference tuning one really made.

I jumped out of my standard ST after a hot lap and straight in to the tuned one, and the difference was clear as soon as I set off. Even coming out of the pits and accelerating up the hill to the bridge that marks the start of a "Bridge to Gantry" lap the difference in performance was huge. It, felt like it accelerated twice as hard as my car, especially lower down in the revs, and the exhaust sounds brilliant too.

Before long the first corner came and stepping on the brakes at the same time as I would in my car I stopped far too soon; the standard brakes are pretty good, but the AP's are amazing. The tyres are really noisy compared to my normal road tyres, and I was not sure if I really liked that, but soon as I started cornering I realised they transformed the car, the grip was incredible. The KW suspension wasn't what I expected either, as it didn't feel uncomfortable, but makes the car feel far more planted than my standard ST, and makes you feel safer pushing the car harder and doing things that made the standard car feel unstable. On the tighter corners, especially the ones where the next straight was steeply uphill, the car was a rocket in comparison to the standard car; the grippy tyres and huge torque made me able to put my foot down far sooner and even if the engine was at 2000rpm the car just shot up the hills. As I got used to the car I pushed harder, but I still didn't get it anywhere near as out of shape on the corners as I normally would in mine, I don't know where the limit is, but it's a night and day difference to mine. Pretty much the whole way around the track I couldn't help laughing at how much more capable the car is, and I honestly could go through the Karussell at least 20mph faster than I ever have managed in my car; the car even took off over crests a couple of times and still felt 100% safe. Straight away I was 26 seconds faster with an average speed a good 20mph faster than I was in my standard car, and that was all while braking far too early for half the track and without pushing the car to its limits at all. One thing is for sure, this car has made my mind up, I'm tuning my ST big time. My missus is going to kill me for spending the cash, and then blame you lot for inspiring me!"

Our car has around 70bhp more than stock

"I was 26sec a lap faster in the tuned Focus" - Mick Clark

Above Mick was blown away by the difference with our tuned ST

Right Mick reckoned he could go 20mph faster round the Karussell

Dale's opinion on our tuned Focus ST

Having lapped the 'Ring more times than he can remember in almost every type of car imaginable, it was going to be interesting to see how Dale thought the tuned car performed. He wasn't confident in the brakes at first, saying they felt very strong but had a slightly strange feel when very hot, though he soon got used to them. The best brake pads for fast road use are very different from the ones best at the Nürburgring, so he recommend swapping your road pads for track/race ones when hitting the ring hard regardless.

He found the engine powerful and torquey, which, combined with the grip of the R888s allowing it to rocket out of the corners. The KW Variant 3 suspension was great and gave the car fantastic balance considering the weight. But at that weight the car is always going to be a huge disadvantage on a twisty track like the Nürburgring in comparison to lightweight hot hatches like the Megane R26.R and Clio Sport 197. Dale's time of 8min 30sec in the car is substantially faster than the official time for a standard ST of 8min 51sec. Very impressive considering the car's weight and simple tuning additions.

Dale suggested upgrading the cooling, as near the end of the lap the temperature got worryingly hot. He would also fit a limited slip diff to help traction and cornering speed, this would improve the time significantly, maybe more than any other addition to this car. Finally, if comfort wasn't a consideration, he would put the car on a serious diet, as the ST weighs nearly half a ton more than some of the fastest hot hatches round the 'Ring. Pretty positive results.

Name: Dale Lomas **Age**: 30+ **Occupation:** Nürburgring Instructor

Stav's opinion on our ST

I was pleasantly surprised how good the ST was out of the box, but after we tuned it – what a transformation! For a road car the most noticeable component we added was the Code:Red remap, as it truly transformed the car's acceleration. Standard boost was 0.6bar and the car had progressive acceleration throughout the rev range, but I like huge torque, and the remap delivered that in spades. With the remap installed boost was doubled to 1.2bar, giving the car massive acceleration even at low rpm, meaning you could plant the throttle in 5th or 6th on the motorway and leave pretty a lot of cars for dead.

The remap gave the car so much power the standard tyres were struggling to cope in the dry and useless in the wet, but the Toyo R888s cured that almost completely.

Aside from the performance aspect, the full Milltek exhaust and Code:Red induction kit improved the sound of the car hugely which made things more enjoyable, especially the exhaust with gave the awesome five cylinder warble when accelerating; a sound that's not been heard since the original Audi Quattro.

When testing both cars back to back at the 'Ring, things were really noticeable. The huge torque of our tuned car was a real bonus for pulling up hills and out of slow corners. Aside from the increased power, the other upgrades – the tyres, suspension, and brakes, all seem to work as a complete package, to the extent where it's difficult to quantify exactly what was making the biggest difference. The car is without doubt transformed compared to the standard version, and is now a real Focus RS chaser. The only slight things to note are after a very, hard lap of the 'Ring the water temperature gets quite high, and also when driving at full boost for extended periods power did seem to drop off a little, both issues seemingly related to the standard intercooler, which is very poor and cannot cope with the increased boost, so in hindsight one of these would be a great addition to the car. I was so impressed with the car that I would love to build one similar, but with a large intercooler, limited slip diff, and totally stripped out.

"The huge 340 lb/ft torque was a real bonus on the 'Ring"

Above Stav was blown away by the performance tuned Focus

Below Our upgrades made the car faster and safer on track or road

Driver training

Having proved that our tuned Focus could lap the Nürburgring quicker than a standard ST, we decided to see if Mick could take any time off his lap in our car. However good your car may be, performance is still determined by driver ability and knowledge; even the most advanced car full of driver aids doesn't drive itself, despite what some people like to say. Because of this, knowing the car and the track you are using it on can gain huge amounts of time.

We asked Nürburgring instructor, Dale Lomas to sit in the passenger seat for a lap around the 'Ring and give Mick advice on the best way to drive . After only a single lap Mick's times dropped from 9min 51sec to 9min 22sec, a huge improvement of nearly 30 seconds. Dale reckoned that after a full days' instruction Mick could probably take another 30 seconds of that time, proving driver training can be an invaluable tool.

Mick was so impressed with the training he is considering going back for more lessons: "Dale told me he thinks I could go just as fast as this in my standard ST with enough training, I'm not so sure about that, but I'd certainly like to find out!" he smiled.

Left The standard 221bhp ST was soon left behind by our 290bhp car!

Right A quick chat in the RSR workshop before we hit the Nordschleife

Instructor Dale demostrates the correct lines in our ST

OUR CHOSEN PERFORMANCE PARTS...

AP Racing brakes

What are they?
A 330mm front big brake conversion with large 4-pot AP Racing calipers.

Why did we fit them?
Standard ST brakes are competent, but like everything, things still can be improved dramatically. Fitting larger discs and calipers potentially gives much more stopping power and the ability for the brakes to cope with sustained abuse without overheating; a common problem with standard brakes in track use.

How did they improve the car?
Aside from looking very impressive, on the road the brakes felt fine, no lack of bite when cold, and no overly sensitive pedal when braking lightly, so for a daily driver they are perfect. You really notice they are fitted when you press hard and they haul you down incredibly fast even from huge speeds. They really come into their own in conjunction with the sticky track tyres as they are so powerful you can easily lock up the standard road tyres. But at higher speeds, even on standard road tyres, the difference was huge. On the 'Ring the brakes instilled huge confidence and you could rely on them corner after corner as the larger diameter disks and calipers not only increased clamping force but dissipated heat faster, keeping brake fade at bay; something that affects even supercars at the 'Ring. Overall a great investment, especially with upgraded tyres to match.

Price: £1,899
Contact: Profile Automotive
Call: 0161 406 9797
Web: www.profile-automotive.co.uk

Left AP Racing brake kit provided huge stopping power

Right The brakes were fitted by Profile's technician

Code:Red induction kit

What is it?
A performance air filter enclosed in an alloy airbox, along with improved air intake piping.

Why did we fit it?
As with most cars, the standard ST airbox looks rather restrictive and is designed to remove induction noise more than for performance reasons, so removing it and replacing it with a freer flowing unit should improve all-round performance and sound better too.

What improvements did it give?
On a turbo car freer breathing improves power right through the rev range, and on the ST it seemed to do just that. We've heard that in testing people have seen up to 20bhp gains from the induction kit, which is certainly believable when you see how much less restrictive looking the new airbox and induction pipes are. The standard airbox looks pretty poor from the outside, but once you see how it is composed inside and realise the ECU takes up half the room you wonder if Ford did this just to keep the power levels low. Aside from the clear performance improvements, the noise of the car was improved too, and while the enclosed airbox stopped it from being too loud, it gave the car a much more purposeful and turbo-like sound.

Price: £399
Contact: Profile Automotive
Call: 0161 406 9797
Web: www.profile-automotive.co.uk

KW Variant 3 suspension

What is it?
Height and damping adjustable fast road and track day coilover suspension.

Why did we fit it?
The vast majority of standard cars, even hot hatches, sit quite high on soft suspension from the factory, mostly due to owners demanding a smooth ride and decent ground clearance, but thankfully for people wanting a much more performance orientated drive, this is easy to improve without losing much comfort or practicality. To get the most from the suspension and tailor it to your own tastes a fully adjustable (height and damping) kit is vital, enabling you to adjust ride height and stiffness.

What improvements did it give?
The first thing you notice is visually the car looks far better and closer to the ground than standard, enough to substantially lower the centre of gravity without scraping the car on speed bumps or the tyres rubbing on the arches. In normal road driving you would be hard pushed to know the suspension was uprated, it's nice and compliant on the road, which is often a sign of a quality suspension kit, but on the bends the body roll was eliminated and the car felt far less top heavy than before, making the car stable and predictable; really confidence inspiring. As standard the Focus was neutral handling without massive understeer, and with the kit fitted this was much the same, but the limits of grip were much higher. Where the uprated suspension was really noticeable was on quick direction changes, as the ST is quite a heavyweight and with the new kit it felt far more nimble than before. Highly recommended.

Price: £1,120
Contact: KW Automotive
Call: 0870 990 7536
Web: www.kwautomotive.co.uk

"KW test all their suspension kit at the Ring, so it's no surprise they were excellent"

Milltek exhaust system

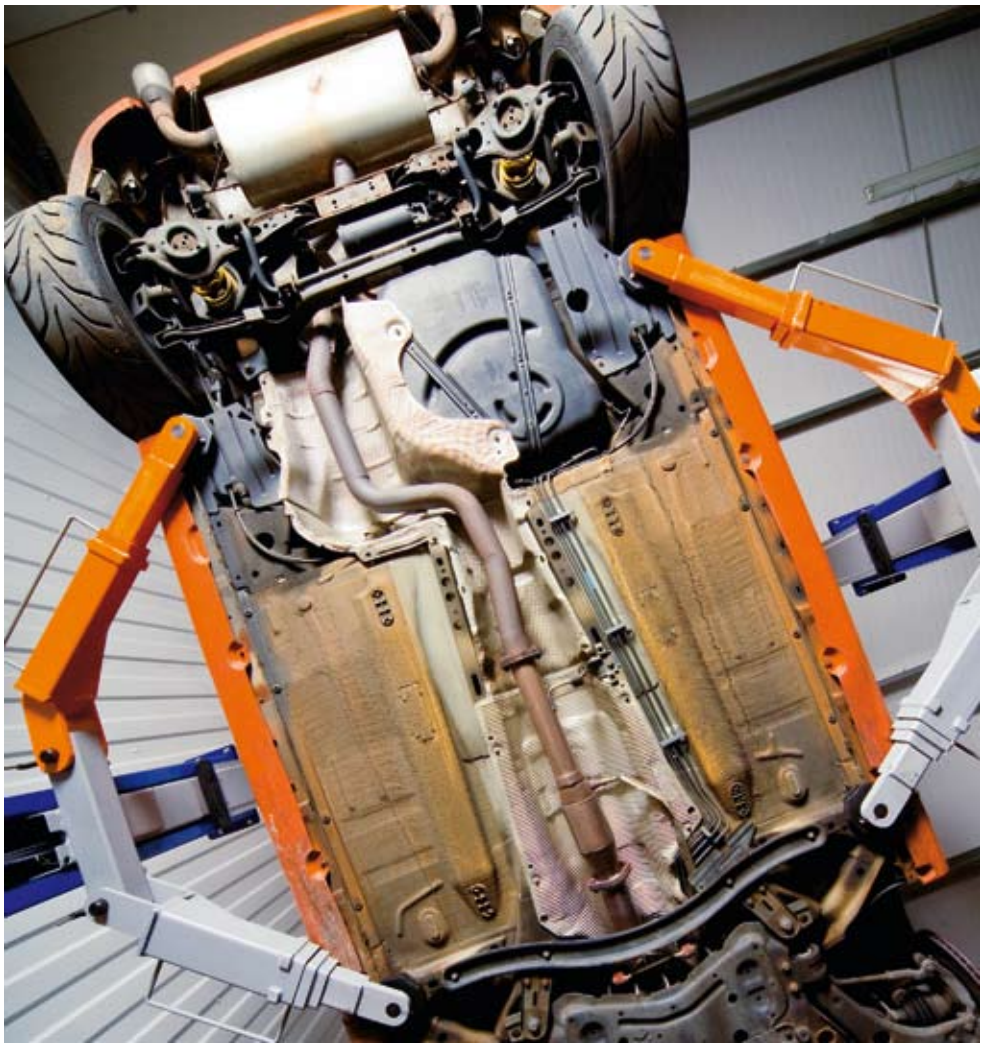
What is it?
A full turbo-back performance exhaust system including downpipe and sports cat.

Why did we fit it?
Back in issue 140 we proved how much of an improvement a full performance exhaust system, especially with a larger downpipe, can give to a tuned turbo car, so it was an obvious decision to make.

What improvements did it give?
As standard the ST exhaust is practically silent, and the car feels slightly strangled at high rpm, a sure sign of a quite restrictive exhaust system. Independent testing has shown claimed gains of over 20bhp from fitting one in the past to STs, so we expected good results.

Turbo Spool-up seemed to slightly improve, but the main gains were higher in the rev range where the power and torque didn't drop off, meaning you could hold onto gears for longer and generally go faster. As big a difference as the performance was, improvement in the sound of the car was just as impressive, with the car now giving the famous five-cylinder warble normally associated with the 1980's Audi Quattro rally cars, which along with occasional pops from the exhaust on the overrun made burying the throttle all the more fun and addictive. Best of all the exhaust was just the right volume, making it sound great without being so loud it would cause problems as a daily driver or break track day noise limits. Thoroughly recommended.

Price: £1,316
Contact: Milltek
Call: 0845 200 8150
Web: www.millteksport.com



Code:Red Level 2 remap

What is it?
Upgraded performance engine map

Why did we fit it?
The main reason to remap a car's ECU is to improve performance, and on a turbocharged engine, especially one as big as the Focus', the gains were potentially massive, with huge power and torque improvements throughout the rev range.

What improvements did it give?
The remap was the single most noticeable upgrade to the car, and changed the power delivery from a smooth, progressive, almost normally aspirated delivery, to what a tuned turbo car is all about; huge midrange punch and a storming top end. The main factor for this was the boost pressure, which as standard peaked and held just 0.6bar, but with the remap peaked at over 1.2bar and held 1bar at the top end; the main reason peak torque is now an estimated 340 lb/ft. The problem with such huge torque and front-wheel drive, especially with an open diff, was huge wheel spin on the standard road tyres, but that's why upgrading as a complete package is so effective as the change to stickier tyres almost totally cured it.

Price: £399
Contact: Profile Automotive
Call: 0161 406 9797
Web: www.profile-automotive.co.uk

Toyo R888 tyres

What are they?
225/40x18in road legal track tyres
Why did we fit them?
As we proved in issue 144, a good set of tyres transform how a car behaves, with drastically improved grip giving huge gains in braking, acceleration, and cornering. The Focus is a heavy front-wheel drive car with an open diff, and with the engine tuning giving huge amounts of power and torque, it needed all the help with grip it could.
What improvements did it give?
As suspected the tyres transformed the car and really allowed you to exploit the extra performance of the other tuning parts. During hard acceleration it transformed the car from a wheel-spinning handful to something that accelerated like a rocket with no fuss at all. They even massively improved acceleration in the wet; something where track day tyres are not thought to be great. Braking was substantially improved too, the huge grip meant you could really use the power of the AP brakes without locking up the tyres. In the corners the car just felt totally planted and safe, and even after hard laps of the 'Ring the tyres had very little wear. The improvements do come at a price though as the tyre noise is increased with these tyres which may not be to some tastes, and although grip in the wet was drastically improved on most surfaces, there were some surfaces, particularly rubberised tarmac used on some temporary road repairs that the tyres were unsettled. Not ideal for poor weather, so we'd recommend taking a set of rims with road tyres to the Ring in case it rains.
Price: £166 each
Contact: Protyre
Call: 01962 774437
Web: www.protyre.co.uk

Above R888s are super sticky tyres that really excel in the dry

Team Dynamics Pro Race 1.2 wheels

What are they?
8x18in multi-spoke alloy wheels in gloss black
Why did we fit them?
As nice as the standard wheels look, they have a lot of meat on them, which makes them damn heavy. They don't give much room for hot air to escape from behind the wheels either, to cool the brakes. For these reasons a set of motorsport wheels should reduce unsprung weight which potentially improves all round performance; and the increased airflow should reduce brake fade from overheating.
What improvements did they give?
With thin spokes improving airflow to the AP Racing brakes, there is a performance advantage of running these wheels and they certainly felt more responsive. One thing is for sure, wheels are the single most influential thing on a car's looks, and fitting these gloss black wheels transformed the look of the car, making it stand out from the crowd and really look the part.
Price: £160 each
Contact: Rimstock
Call: 0121 525 6500
Web: www.rimstock.co.uk

"With the tuning upgrades and driver training Mick was a huge 56sec a lap faster"

Conclusion

This test proved that with well chosen upgrades, you can transform the performance of a car while maintaining usability. We travelled over 1000 miles, across five countries to go to the 'Ring and back in comfort, no problem. With the tuning upgrades and driver training thrown in, we managed to go a massive 56sec faster than in a standard Focus ST. Not only did we prove that it was perfectly possible, but we learnt a few other things too which we would recommend to everyone...

Firstly, improving one part of the ST often showed huge weak points in others, with the extra power showing the lack of traction on the standard tyres for example. So it is certainly beneficial to upgrade the car as a whole rather than concentrate on one area. Doing this keeps the car balanced and faster in all conditions.

Secondly, the Nürburgring is incredibly hard on your car. One lap is the equivalent to a 20 minute session on a UK track, so to save any unexpected surprises when you get to the 'Ring, it is worth making sure your car can survive a UK trackday before you drive to Germany.

Engine cooling is a big issue at the 'Ring, and though we expect our radiator would've coped normally, with the standard intercooler still fitted and inlet air temperature going through the roof, it not only reduced power, but increased engine heat to a stage where the water temp was uncomfortably high by the end of the lap. For this reason an uprated intercooler and maybe even an uprated radiator and oil cooler would be a wise move.

Finally, as the split oil breather diaphragm proved, tuning can often show up a car's weak points. These are often minor but could spoil your day before it even begins, so it is wise to check and fix for any common problems like that before you give your newly tuned car beans.

The only part of the car that we could possibly say isn't totally suitable for a daily driver is also the thing that had one of the biggest all-round effects, and that was the road legal track tyres. The road noise and slightly unnerving behaviour on standing water may be too much for some, but without them on this car you simply wouldn't be able to harness the huge braking and accelerating power the AP's and engine tuning gave. One thing that should help the car cope without these tyres, especially under acceleration, would be a limited slip diff, which will distribute power and grip between both front wheels rather than simply going to the wheel with the least resistance like the current open differential does.

Finally, as Mick's fantastic improvements in just one lap with Dale proves, driver training is worth its weight in gold. Turn to page 44 to find out more. *Redline*

Above Tuning car and driver can make you faster. Simple as that

THE TIMES

(ALL TIMES BRIDGE TO GANTRY)

Quickest current lap time for standard Focus ST	8min 51sec
Dale driving our tuned ST	8min 30sec
Mick driving his standard ST	10min 17sec
Mick driving our tuned ST	9min 51sec
Mick driving our tuned ST with Dale instructing	9min 22sec

A LIST OF OUR RECOMMENDED PERFORMANCE PART SPECIALISTS

Suspension
- KW: www.kwautomotive.co.uk
- Bilstein: www.bilstein.com
- Weitec: www.weitec-suspensions.co.uk
- H&R: www.weitec-suspensions.co.uk
- HSD: www.hsdcoilovers.com

Induction kits
- K&N: www.knfilters.co.uk
- Pipercross: www.pipercross-airfilters.co.uk
- RamAir: www.ramair-filters.com
- Green: www.greenfilters.co.uk
- ITG: www.itgairfilters.com

Remap contacts
- Code:Red: www.profile-automotive.co.uk
- DreamScience: www.dreamscience-automotive.co.uk
- Evolution Chips: www.evolutionchips.co.uk
- Morego: www.morego.co.uk
- Revo: www.revotechnik.com

Exhausts
- Milltek: www.millteksport.com
- Scorpion: www.scorpion-exhausts.com
- Mongoose: www.mongooseexhausts.com
- Piper: www.piperexhausts.co.uk
- Japspeed: www.japspeed.co.uk

Brakes
- AP Racing: www.apracing.com
- Tarox: www.tarox.com
- Brembo: www.brembo.com
- Mintex: www.mintex.co.uk
- Ferodo: www.ferodo.co.uk

Tyres
- Toyo: www.toyo.co.uk
- Dunlop: www.dunloptyres.co.uk
- Pirelli: www.pirelli.co.uk
- Yokohama: www.yokohama.co.uk
- Avon: www.avon-tyres.co.uk

Wheels
- Team Dynamics: www.rimstock.co.uk
- Rota: www.rarerims.co.uk
- Compomotive: www.comp.co.uk
- BBS: www.performancealloys.com
- OZ: www.performancealloys.com

BIG THANKS TO
• **KW Automotive** www.kwautomotive.co.uk
Profile Automotive www.profile-automotive.co.uk
• **Team Dynamics** www.rimstock.co.uk
• **Protyre** www.protyre.co.uk
• **Manfred at Code:Red** www.codered-chiptuning.de
• **Garmin** www.garmin.com
• **The Nurburgring** www.nuerburgring.de
• **RSR Nürburg** www.rsrnurburg.com
• And of course, Mick Clark for bringing his ST along

BEHIND THE SCENES

Looking at the feature you probably think we spent our time hooning around the 'Ring, drinking lager-beer and generally having rather a jolly time. And you'd be right! But we also worked flat out for three days to make it happen.

Apart from the actual hour's testing, we could only use the Nordschleife for photography when it was closed, so this meant being there for 6am before it opened for testing at 8am. It's a bizarre experience walking about on the Karussell at dawn when it's eerily silent, but not quite as odd as driving back to the start of the track – the wrong way! Oh yeah, and it rained. Lots.