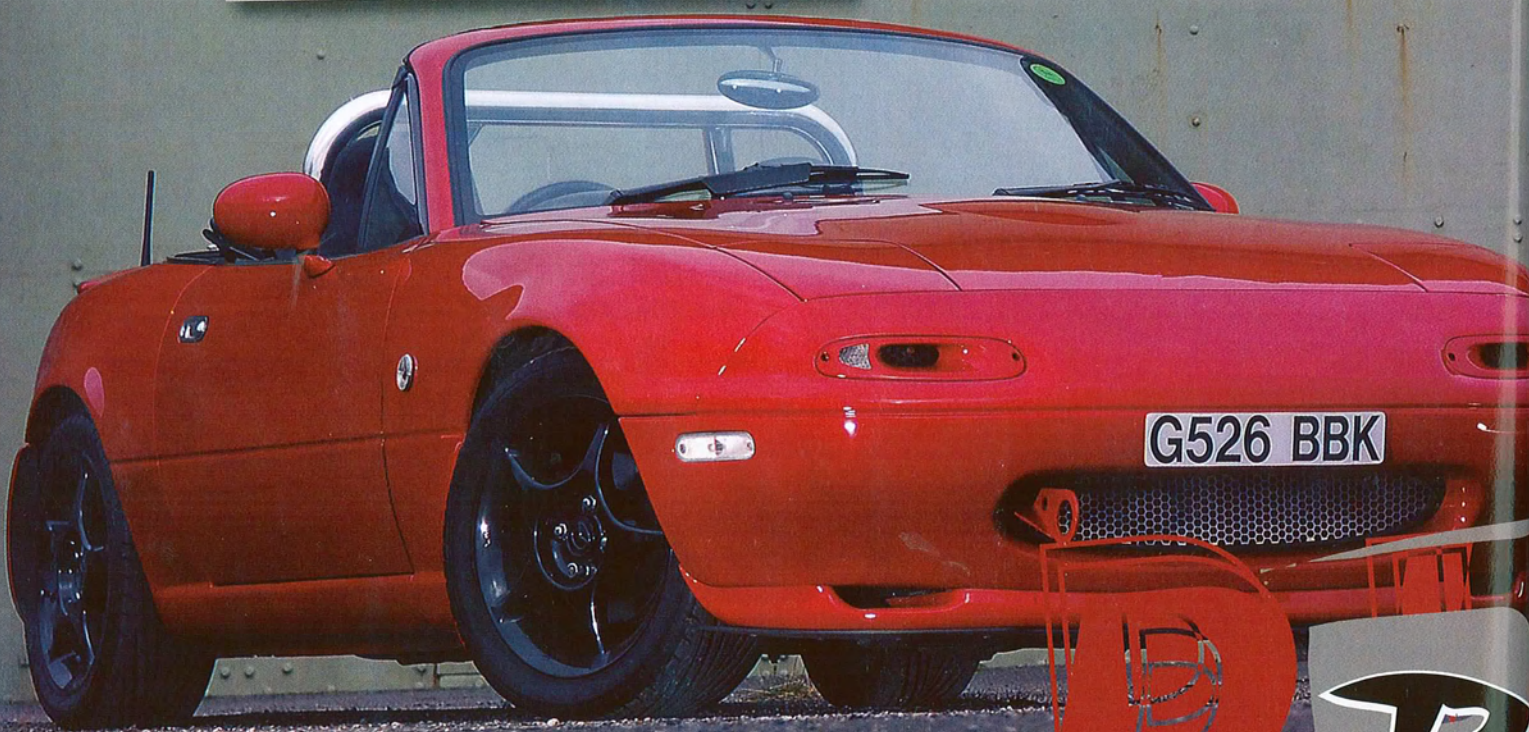
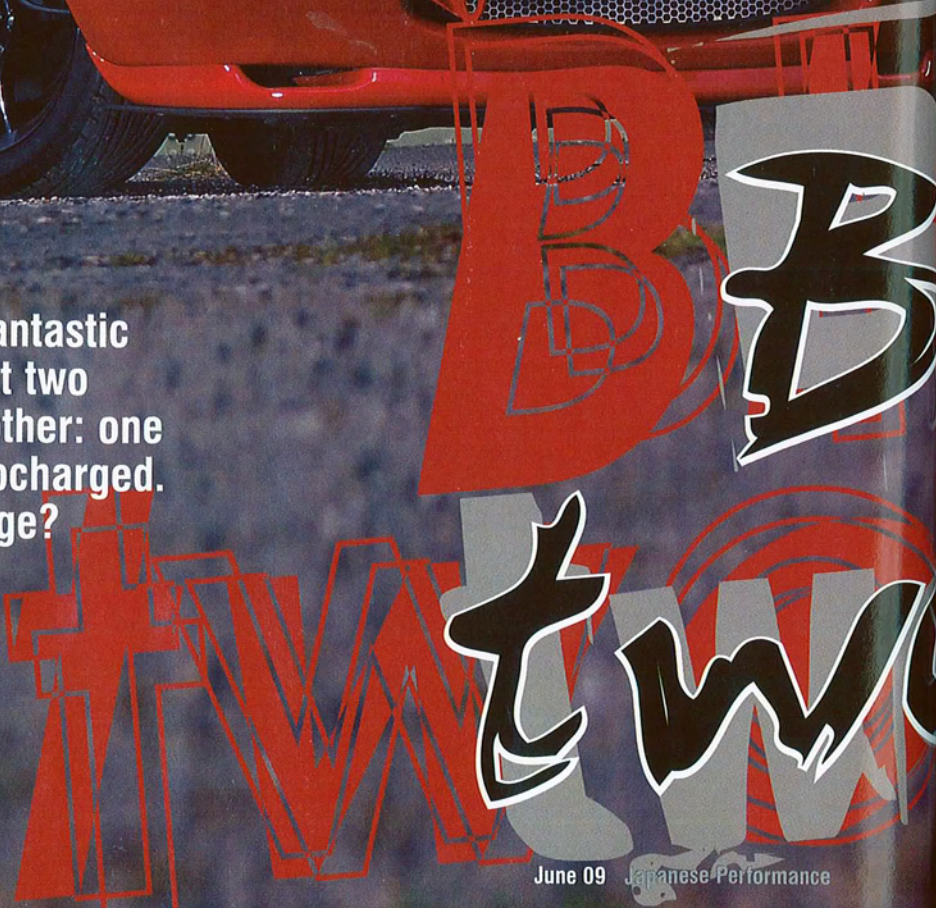


*Two very different ways of liberating more power – supercharging and turbocharging – but they actually produce very similar drives. One thing's for sure: the MX-5 was made for boosted power!*



**Power is what the MX-5's fantastic chassis cries out for. We get two owners to face up to each other: one supercharged and one turbocharged. But whose MX-5 has the edge?**

Words & photos: Martin Vincent





**B**rilliant though the MX-5 may be, it always needed more power. Bolt on a supercharger or a turbo kit and you'll get it. It's easy and cost-effective too: you can do it in a day, and end up with 40-50 per cent more power and torque. But which is better – turbo or supercharger? That's what we're here to find out.

Forced induction really transforms the MX-5, and the potential is huge. It's relatively easy to reach 230-250bhp, while if you go up to forged engine internals, it's even possible to get a 1.8-litre MX-5 engine to kick out over 400bhp.

The fantastic thing about the MX-5 is that the engine is ready-prepared for forced induction. It's essentially the same motor as the Mazda 323 Turbo so, provided the boost level is kept moderate (6-12psi), the base unit can be kept intact – retaining all its reliability.

Turbo and supercharged MX-5s have been around almost as long as the car itself. As early as 1990, Mazda UK offered a

turbocharged version built by Brodie Brittain Racing through Mazda dealers. Meanwhile, in Japan, Mazdaspeed offered supercharged versions.

The aftermarket was quick to get in on the act, too, and the USA has seen a flourishing scene with names like Jackson Racing, Flyin' Miata, Mazdaspeed, Bell Engineering, GReddy and HKS. More recently, Cosworth has developed a supercharger kit for the Mk3 MX-5.

With decent early MX-5s now selling for as little as £1500, the compact roadster is a tempting prospect. If you go for a Eunost, it will probably have a limited-slip diff and better equipment, too. But before even thinking about fitting a turbo or supercharger, you need to ensure the cooling, ignition, fuelling, intake and exhaust are fit for the job. The brakes might need upgrading too.

So let's answer our question. Which is better: turbo or supercharger? We've invited two passionate owners to fight their corner, one turbocharged, the other supercharged. Who comes out on top?

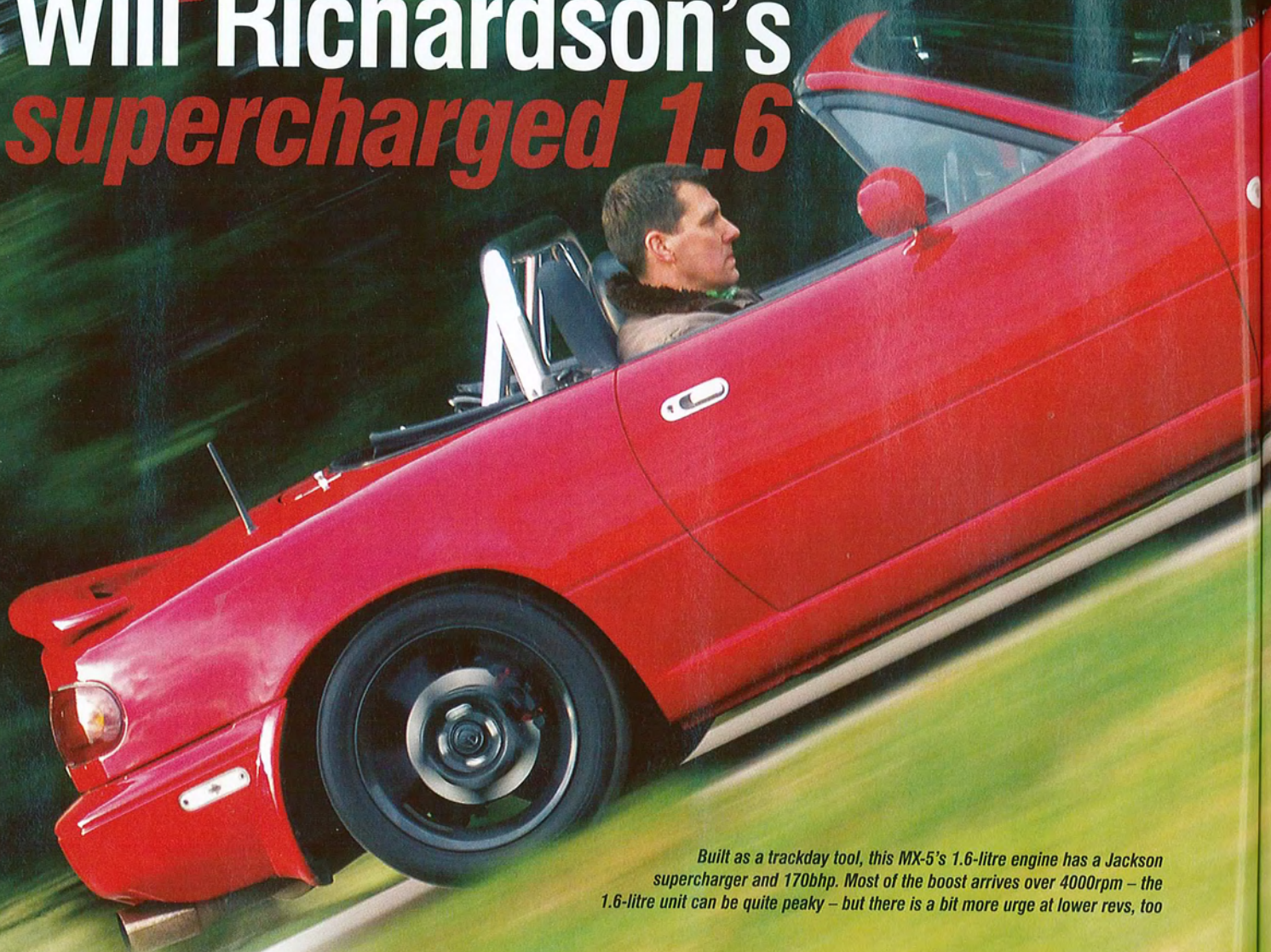


down  
ways



# Supercharger

## Will Richardson's *supercharged 1.6*



*Built as a trackday tool, this MX-5's 1.6-litre engine has a Jackson supercharger and 170bhp. Most of the boost arrives over 4000rpm – the 1.6-litre unit can be quite peaky – but there is a bit more urge at lower revs, too*

**B**uilt and developed as a trackday car, Will Richardson's immaculate red 1990 Eunos Roadster 1.6 is very much about speed and function. Will bought this Eunos five years ago when he was looking for a rear-wheel drive track car. It came with a decat sports exhaust and a set of Spax coilovers.

Before looking for more power, Will set about upgrading the rest of the car. The brakes were changed for the beefier 1.8-litre type, and then he fitted front and rear chassis braces and a roll bar to stiffen the body structure. He also fitted a more supportive seat from a Vauxhall VX220 and a Willans four-point harness.

Will's first trackday at Castle Combe revealed weaknesses in the suspension. The car felt far too skittish so the ultra-stiff Spax units were ditched in favour of GAZ coilovers. Also, thicker front and rear anti-roll bars were fitted which made a big difference in limiting body roll.

Those 15in Enkei wheels are extremely light and, while they appear to be aftermarket, they're actually stock MX-5 items, picked up from an MX5Nutz forum member. They came with grippy 195/55 Goodyear Eagle F1 tyres, which Will feels are fine on a light car like this. He also added an OEM lip spoiler and a lower splitter to add downforce. 'I was really happy with the way it handled and the brakes were good too, so the next priority was to see how I could get a bit more power from the 118bhp 1.6 engine,' he says.

Will's first thought was to fit a turbo kit, but after hearing horror stories from other MX-5 owners about some of the cheaper kits

(cracked manifolds and fractured oil lines) he decided to go for a supercharger instead. 'I'd always liked the idea of a supercharger. I first had the engine checked out, and that all seemed good, so I changed all the oils for decent synthetics and found a second-hand supercharger kit.'

This was a Jackson Racing unit, based on the M45-type blower. It consisted of the supercharger, pipework, throttle linkage and AFPR (fuel pressure regulator) to enrich the fuelling. It all cost just £1000. Before fitting it, Will spent some time with a buffing kit polishing up the upper casting to a mirror finish. It looked so good that he also tackled the intake manifold and, together with the chrome cam cover, it creates a gleaming engine bay.

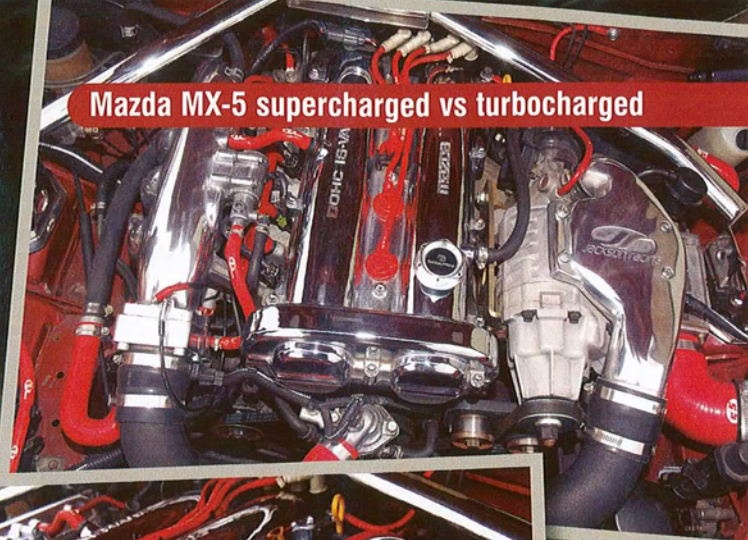
It was dead easy to fit, too. 'If you're fairly competent with a set of spanners, it should only take a few hours,' Will says. The results were also good, showing immediate gains in performance. But it wasn't perfect at first. The AFPR is a very crude means of increasing the fuelling and it was making the engine run rich. Nevertheless, Will ran it like this for a while, putting up with the poor mpg, because it performed so well. 'It is really strong over 4000rpm, which is when the supercharger begins to push hard, but there's a bit more at lower revs too. I did expect it to be stronger at lower revs but then the 1.6 engine is a peaky unit, and it does pull nicely to 7000.'

At Will's next Castle Combe trackday, it struggled to pass the noise test, so a 'Flyin' Miata performance cat was fitted in place of





## Mazda MX-5 supercharged vs turbocharged



### Thanks/contacts

Moonrakers (<http://moonrakers.ismyforum.co.uk>)  
 MX5Nutz ([www.mx5nutz.com](http://www.mx5nutz.com))

the decat pipe to quieten it down. And after two years, the standard clutch is now starting to let go under full power, so Will plans to fit a larger flywheel from a 1.8 engine, plus an updated 1.8 clutch.

As originally fitted, the 'charger ran the standard 5psi boost, but since then the nose pulley has been changed to raise the boost to 7psi. At the same time, a dual-feed fuel rail and Supra 320cc injectors went on to ensure an adequate fuel supply. Also, a GReddy e-Manage piggyback ECU with Boomslang harness and Cosworth 2.0bar MAP sensor was fitted and the unit adjusted on the road by a friend. 'I was amazed how much fuelling was taken out of it – it was way too rich before,' he says. An air/fuel gauge provides an accurate guide.

The only occasional hiccup now is when the car runs in really hot weather. With the car running about 7psi and pushing out about 170bhp, there's still no intercooler. 'If I decided to go any further, I would fit an intercooler, oil cooler and smaller nose pulley for a bit more boost,' says Will. 'I've also got a 4-2-1 manifold awaiting fitment. I'd like to get it up to about 180-190bhp'.

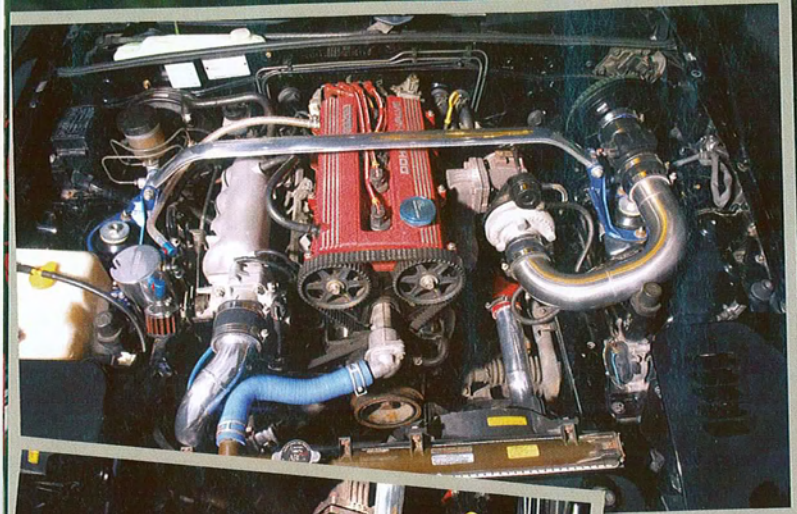
But even as it is now, the 50 per cent gain in power works superbly. 'I've overtaken a lot of cars on the track that I wouldn't have been able to before,' says Will. 'It's such a buzz when you get out there on track. It was what the car was made for, really.' With the car set up so well for the track, Will can see no other car worth replacing it with, at least none that's affordable. And that's the beauty of a blown MX-5: it's cheap and it works brilliantly.

## SPecification

Will Richardson's  
 1990 supercharged Eunos Roadster Mk1 1.6

<b>Engine</b>	1.6-litre unit with Jackson Racing M45 supercharger, 67.5mm pulley, TDR belt tensioner, GReddy e-Manage ECU, Cosworth 2.0bar MAP sensor, dual-feed fuel rail, Supra 320cc injectors, FM O2 clamp, AEM wideband O2 sensor, SFS hoses, Ultra 8mm ignition leads, NGK iridium plugs, chrome cam cover, polished supercharger and intake manifold, FM cat, unknown Jap big-bore exhaust system, Silkolene oil
<b>Transmission</b>	Standard five-speed gearbox, Silkolene Pro fluids
<b>Suspension</b>	GAZ adjustable coilovers, Racing Beat anti-roll bars and adjustable drop-links, additional chassis braces
<b>Brakes</b>	1.8-spec brakes, Axxis Ultimate front pads, EBC Redstuff rear pads, Goodridge hoses
<b>Wheels and tyres</b>	Enkei lightweight 6x15in wheels, Goodyear Eagle GSD F1 195/55x15 tyres, nitrogen inflation
<b>Exterior</b>	OEM lower spoiler with Track Dog Racing splitter, Mazda boot spoiler, Cusco tow hook, Raybrig lights
<b>Interior</b>	ARC roll bar with bodywork reinforced at rear attachments, Momo Corse wheel, Auto Meter boost gauge, SPA oil temp/pressure gauge, AEM air/fuel gauge, Turbo XS knock light, Willans four-point harness, VX220 seat, Zoom mirror





## SPecification

Rik James's 1995 MX-5 1.8 turbo

<b>Engine</b>	1.8-litre with BBR turbo conversion using T25 turbo, front-mount intercooler, hard pipes, stainless steel inlet tract, HKS filter, BBR ECU, Cosco oil catch tank, wire tuck, Protege cam cover, Magnecor KV85 leads, Nopro washer fluid tank, ARC rad cap, ARC rad plate, silicone hoses, Mazdaspeed oil cap, Mazdaspeed engine mounts, RSR Exmag GT 2 exhaust, decat pipe
<b>Transmission</b>	Standard five-speed manual
<b>Suspension</b>	Koni Sport dampers and springs, Fat Cat Motorsport top mounts and bump stops, Whiteline ARBs, Polybushed ARB links, Cosco strut brace
<b>Wheels &amp; tyres</b>	RS Watanabe Type B 6.5x14in alloys, Toyo Proxes T1R 195/55x14 tyres
<b>Exterior</b>	Garage Vary front lip, Eunos foglamps, Carbing tow hook, Carbing number plate bracket, louvred headlight lid, GR Craft arches, GR Craft rear lip, Mirakumi carbon bootlid, Garage Vary rear light conversion, Vitaloni M2 mirrors, Zoom fuel lid, Zoom side repeaters, RS Active low pro headlamps
<b>Interior</b>	KG works door pulls, Neilix door cups, RS Products toggle switches and heater panel, Type MG dial faces, Zoom rear-view mirror, Mazdaspeed seat, Nardi wheel, Drift gearknob, leather binnacle, dash pads and door tops, M2 1001-style console, black quilted rear deck, door panels, tunnel and footwells, vintage door straps, M1001 pedal set, Auto Meter boost gauge, stainless vent rings, ArtWorks Dewa dial surround, IL dial rings, chrome cabin brace, Hard Dog M1 rollbar

*Ultra-rare BBR conversion of 1.8-litre engine produces around 180bhp in its current form, with plenty more potential there. Power delivery is potent and surprisingly lag-free. Front-mount intercooler is fitted, in contrast to the supercharged MX-5 on the previous pages*

**N**o question – this black turbo MX-5 belonging to Rik James is an absolute gem. Brimming with JDM style, it's hard to believe that it began life as a UK-spec MX-5. It had only covered 40,000 miles when Rik bought it two years ago and it turned out that the BBR turbo conversion had been fitted when the car was new, along with uprated suspension and TWR wheels, plus a few other goodies. It's super-rare: BBR only converted 11 1.8-litre models and this is the only known survivor.

'I had driven a standard 1.6 MX-5 and it was fairly gutless, but the 1.8 BBR felt like a powerful car even with a tired turbo and standard exhaust. There was no lag to speak of,' says Rik. Although he was open-minded about a supercharged or a turbo MX-5, he was drawn more to the turbo for its thrill factor. 'I just felt that a turbo would be more fun – it appeals to my juvenile nature!'

One of the first changes was to fit a large-bore Flyin' Miata exhaust to replace the original. The 2.5in-bore FM was great, but was soon changed for a louder Japanese RSR Exmag GT2 type (just for the kudos of having a rare JDM part). Next came the suspension. 'The rock-solid Spax coilovers were far too low, so I changed them for Koni Sport adjustable dampers and Koni springs,' explains Rik. These were fitted by Performance Autoworks with Fat Cat Motorsports top mounts and bump stops. The car immediately felt better to drive, with improved handling, ride and steering.



# Turbo Terror

Mazda MX-5 supercharged vs turbocharged

## Rik James's BBR turbo 1.8



When the wheels were changed for super-light RS Watanabe Type B 6.5x14s, the overall feel got even better because of the lower unsprung weight. The 195/55 Toyos also provided more grip. Soon afterwards, a set of Whiteline anti-roll bars were fitted to keep body roll in check – ‘a revelation,’ reports Rik. Another addition was a Hard Dog rollbar that reduces scuttle shake.

The powerplant remains pretty much as BBR intended. That means a T25 turbo (recently replaced with a new item) and a front-mount intercooler with hard pipes. The electronics are sorted by the original BBR piggyback unit but Rik has changed the original, over-complex and restrictive BBR filter and intake for a simple HKS mushroom filter attached by a custom pipe. This will eventually be boxed in and fed with cool air from the bulkhead area.

Rik says that the new intake arrangement plus the big-bore exhaust makes a big difference, while another jump in performance was gained simply by changing the spark plugs for the grade 7s and fitting new leads.

It was never the plan to go for silly power but Rik did want to maximise the engine's potential in its current form, which boosts at around 7psi, peaking at 10psi. He enjoys a lag-free delivery and around 180bhp. The next step is to fit a set of 320cc injectors, a decat pipe and a GReddy e-Manage, which should liberate more torque and provide a solid 200bhp. While he could achieve even more power, Rik feels that his money would be better spent on a limited-slip diff – and we'd agree.

We also love this car's superb detailing, much of it using rare

and exotic goodies from Japan and the US. Check out the spec list for all the details, but it's worth mentioning the Garage Vary tail-light conversion and the Mirakumi carbon bootlid, styled after Mazda's M2 1028 car. The GR Craft arches add real character to this car too, as do the carbon front lip, Vitaloni M2-style mirrors and Perspex quarter-light vent. It's all very JDM and very cool.

The custom treatment extends to the interior. The rear deck, door cards, transmission tunnel and footwells have been trimmed in black quilted material while black leather has been used for the instrument console and centre console. Rik trims vintage cars for a living, so it's all top quality work. Check out the alloy KG Works door pulls, vintage door straps, alloy window winders, and chrome-rimmed instruments. It's probably best to overlook the gearknob though...

Although he hasn't yet tried the car on track, Rik aims to try a trackday soon. Overall he feels there are no real negatives in going for a turbo MX-5. Having recently renewed the turbocharger, it's proving very reliable and does about 29mpg in everyday driving.

### Thanks/contacts

Rich at Performance Autoworks, Max at Rev9autosport.com, all at [www.MX5nutz.com](http://www.MX5nutz.com) and [www.clubroadster.net](http://www.clubroadster.net)



# Verdict

Some people say that a supercharger produces more mid-range punch, while a turbo creates more of a top-end rush. But the truth of these blown MX-5s is that both cars display very similar power characteristics. Sure, there *is* more of a rush with Rik's turbo car, while Will's supercharged MX-5 is marginally more progressive in its delivery, but there really isn't much in it. With either car you experience a broad spread of torque from around 3000rpm upwards, both feeling like they have larger, beefier engines.

Will's supercharged 1.6 is lively and has clearly been very well set up. Although Rik's turbo car probably has the edge in outright pace, you kind of expect that with the larger 1.8 engine. In the final analysis, it's really hard to choose between them: both have a massive performance bonus over standard. Both would give any Evo or STi a hard time on the circuit.

Here's our advice, though. For the power-hungry who want to chase big numbers, the most effective method is to go for a turbo. But bear in mind that forged internals will be needed beyond about 260bhp.

With a limited budget of £1000 to £1500 to spend, the best choice is to look for a second-hand supercharger kit. The Jackson Racing M45 or MP45 are easy to find, simple to fit and rarely go wrong. If you plan to keep the car for a few years, it's probably worth buying new.

Buying a second-hand turbo kit is more risky unless you know its history (it's impossible to tell from visual inspection if the turbo bearings are in decent order). Also, to do the job properly is a lot more involved than supercharging and will probably cost more. Fitting a new turbo is best left to the experts as there are so many variables and careful set-up is vital.

To learn more about the pros and cons, check out forums like MX5Nutz and websites like Flyin' Miata's which are packed with information. Whichever way you go, forced induction in an MX-5, even a simple low-pressure system, will net you big gains in power and torque. Which is exactly what the MX-5 needs. ●

## Useful contacts

Moss Europe ([www.moss-europe.co.uk](http://www.moss-europe.co.uk))  
MX5 Parts ([www.mx5parts.co.uk](http://www.mx5parts.co.uk))  
Flyin' Miata ([www.flyinmiata.com](http://www.flyinmiata.com))