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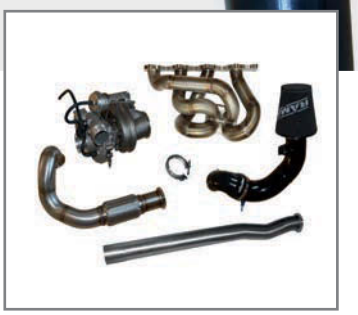

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SEE PAGE 44 FOR DETAILS

BACK TO THE OLD SCHOOL!

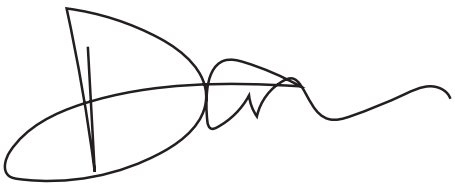
The period that passed since our last issue was a busy one on the Vauxhall scene, with both PVS and the relocated VBOA National Rally taking place in recent weeks. Both events were blessed with brilliant weather and a fantastic selection of club stands exhibiting some of the best Griffins out there. See if you can spot yours in our show reports.

A healthy number of Cavalier Turbos were in attendance at each event, which isn't surprising considering the model is currently enjoying its twenty-fifth birthday. With this milestone in mind, we brought together some of the best examples of the sporty saloon for a celebratory photo shoot at Santa Pod. If you like what you see, then flick to page 94 and have a look at our Cavalier Turbo buying and tuning guide.

It's not just C20LET-powered cars that had a big impact in an age before VXRs. Who can deny the brilliance of the Lotus Carlton?! We took Vauxhall's Heritage Centre example for a spin around the rural roads of Oxfordshire on an action-packed day that also saw us hop in and out of some of the manufacturer's oldest and most significant sports cars. Turn to page 54 and marvel at the 113 years of amazing automotive history we had at our disposal. Tiller-tastic!

Performance Vauxhalls powered by engines from other car makers have always been of interest to us (which is why we've featured Germaine Shelton's 450bhp SAAB-powered Mk3 Astra GSi and Richard Ireson's Mazda-propelled Chevette in this issue), but we'll be the first to admit that you don't need to look beyond the Vauxhall stable in the hunt for high horsepower. Proving the point, the guys at VXR tuning and sales centre, MW Performance, have brought their vision of a Mk5 Astra VXR Sports Tourer to life. Based on an SRi estate, featuring Nürburgring Edition trim and making good use of a tuned Z20LEH engine (and a matching M32 six-speed transmission), it's difficult to believe that the car they've built is anything other than a modified factory VXR! Check it out on page 86.

By the time the next edition of *Performance Vauxhall* comes around, our indulging in old-school cool will have been usurped by an appreciation of thoroughly modern machinery thanks to the news that we'll be getting our hands on the brand new VXR8 GTS-R. Read all about this awesome Aussie import on page 18. For now, I'm off to wish my Cavalier Turbo a happy birthday. Catch you later!



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AUGUST/SEPTEMBER 2017

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FAST FACTS

SAAB B234 2.3-litre engine
GT30 turbocharger
Getrag **F28 six-speed** gearbox
Ferrari **Rosso Scuderia** paint
Mk2 Astra **GTE digidash**

WORDS Emma Woodcock **PHOTOS** Matt Woods

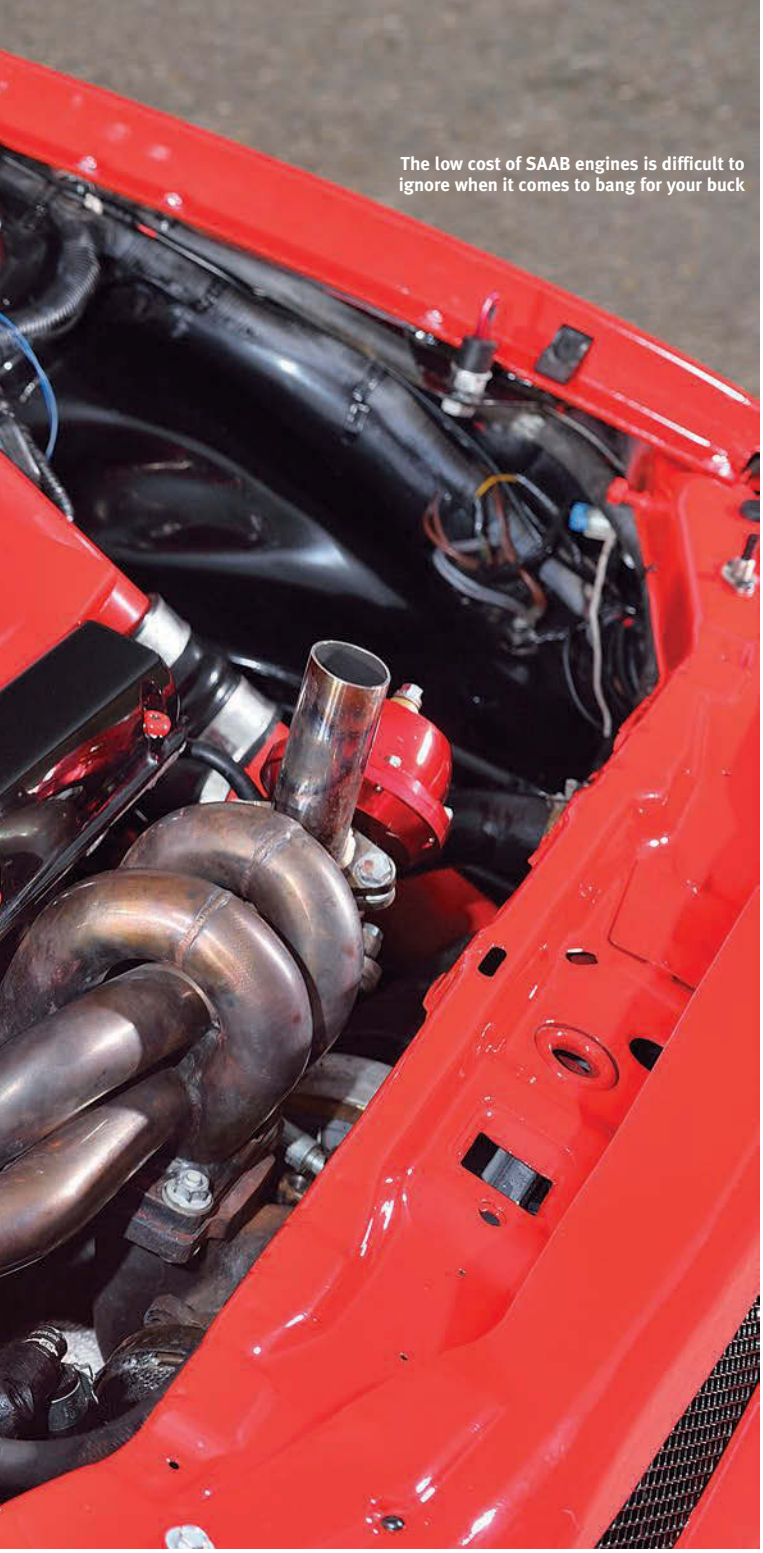
SWEDE SENSATION

Germaine Shelton's **450bhp** Rosso Scuderia Mk3 Astra GSi is propelled along the quarter-mile by 2.3-litres of SAAB power...

"MOST TURBOCHARGED SAAB ENGINES WILL BOLT ONTO THE SUBFRAME OF YOUR VAUXHALL"

Swedes – the people, not the slightly strange vegetable that's half cabbage, half turnip and all awful – have a good thing going. From pickled herring to paid parental leave that stretches over 480 days, from Swedecore death metal to saunas, theirs is a nation that does things differently. And they do differently well. Just look at their cars: blocky Volvos, lock-stocky Koenigseggs and everything in-between. For Vauxhall fans, however, there's one Swedish brand that stands above and beyond even IKEA for plug and play appeal.

We are, of course, talking about the dearly departed SAAB, purveyor of aircraft-inspired automotive design. The demise of the company's car



The low cost of SAAB engines is difficult to ignore when it comes to bang for your buck

TECH SPEC

ENGINE
SAAB 2.3-litre B234 inline-four, decked and machine-hemmed block, polished crank, Wössner oversized 9.5:1 pistons, PEC connecting rods, ARP fasteners throughout, GT30 turbocharger, Tial blow-off valve, 38mm wastegate, 880cc Denso fuel injectors, Ramair 100mm air filter, Cosworth 3bar MAP sensor, 2.5-inch intake pipework, Nissan 200SX exhaust manifold, custom three-inch stainless steel exhaust system, sixteen-row standalone oil cooler, Coolingmist water/methanol injection kit, Crankworks custom map on standard SAAB ECU, engine bay highlights painted Ferrari Rosso Scuderia, battery relocated to boot

POWER
Estimated 450bhp, 400lb/ft torque

TRANSMISSION
Front-wheel drive, Getrag F28 six-speed manual gearbox, Abbott Racing lightened flywheel with ARP fasteners, Drivetorque Stage 3 five-paddlie clutch from Larkspeed, Quaife ATB limited-slip differential

SUSPENSION
Bilstein dampers, 60mm lowering springs, custom rose-jointed drop links, SAAB 900 NG rear anti-roll bar and lower arms, SAAB 900 NG subframes

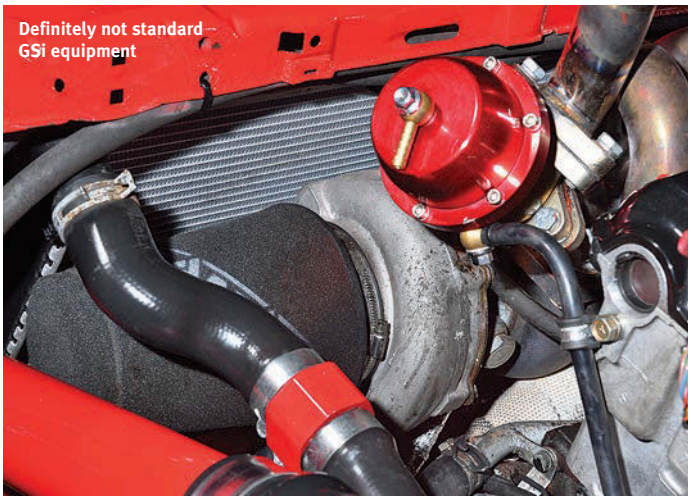
BRAKES
Factory calipers, SAAB 308mm front discs and pads, standard GSi rears

WHEELS & TYRES
17-inch SAAB Three-Spoke Double alloys painted gloss black, Toyo Proxes R888R 205/45/17 tyres

BODY
1995 Mk3 Astra GSi Phase 2, full respray in Ferrari Rosso Scuderia, raised bonnet, shave door kit with keyless entry, Morette front panel incorporating Fly Eye headlights and meshed grilles, Mk3 Cavalier sunroof wind deflector, aftermarket front splitter, BMW E36 M3 door mirrors with relocated side repeaters, Aerocatches, windscreen washer jets relocated to scuttle panel, heavily tinted rear windows, smoked jewel rear lights, Fly Eye indicators, meshed lower foglight apertures

INTERIOR
Stripped cabin, factory GSi front Recaro sports seats, rear bench delete, Raid 300mm leather-trimmed three-spoke steering wheel, Snap Off boss, digital oil pressure and boost gauges, Mk2 Astra GTE digidash

THANKS
Andrew Crank at Crankworks for the live mapping, Spence for the bodywork, Precious Metals for the paint job, Simon at Automotive Engineering in Northampton, and most of all, to Nais Nais for the loan of her hairbands!



Definitely not standard GSi equipment

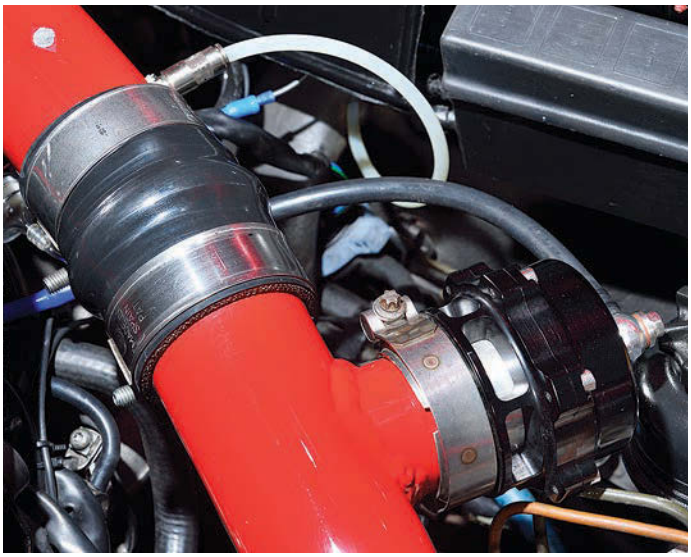
making division is unfortunate, but there's much for Vauxhall fans to celebrate when it comes to SAAB's rapidly aging General Motors era battle buses and their four-cylinder turbocharged engines, many of which have found their way beneath the bonnets of Novas, Astras, Vectras, Cavaliers and Omegas.

TAKE A CHANCE

We first covered the phenomenon a while back, following up in our October/November 2016 issue (order your copy at: *www.bit.ly/PV20161011*) with a guide to the various SAAB engines that will fit snug in your Vauxhall's engine bay. What we said then still holds true: donor cars are cheap, the potential for big bhp is huge, and best of all, due to cross-manufacturer parts sharing, most

turbocharged engines fitted to the SAAB 9000, 900 NG, 9-3 and 9-5 will bolt straight onto the subframe of your similarly aged Vauxhall.

Germaine Shelton, owner of the rollicking red Mk3 Astra GSi you see laid out on these pages, is a man who got straight in on the engine-swapping action. He started a few years back when he determined that his Pineapple Yellow Mk3 Astra



"FAR REMOVED FROM THE ROSSO CORSA OF EVERY 360 MODENA IN THE METROPOLIS, SCUDERIA POPS UNDER SUNLIGHT"

Sport just wasn't fast enough. He'd already added an aftermarket air filter and an uprated exhaust, but he was itching for more horsepower. Eventually, a locally-advertised Calibra presented itself as available for purchase, leading to the mechanic from Kettering killing the coupe for its C20XE 'Red Top' engine.

MONEY, MONEY, MONEY

In his own words, the car was "the mutt's nuts", but the warm glow didn't last long; the two-litre Vauxhall engine hit the skids when the Astra was out-accelerated by a Honda Accord Type R. To rub salt into the wound, the Japanese saloon was pretty much standard spec. Our man wasn't going to stand for that, and set about the search for an alternative powerplant. A C20LET was the obvious next step, but lofty asking prices proved prohibitive.

Like all the very best stories (ahem!), *Performance Vauxhall* came to the rescue, in this case with an article we presented in 2009 about a B234-engined Astra van. Okay, we were known as *Total Vauxhall* back then, but you know what we mean! Germaine read the feature and fast fell in love with the concept of SAAB power. Within a couple of months, he'd bought a SAAB 900 NG ('Next Generation', indicating a 900 built under GM rule) and dropped its two-litre, turbocharged B204 into his Astra.

"It's a great engine because it'll make strong power on a small budget," he explains. "More importantly, it's not that hard to fit a B204 into the front end of a Vauxhall. The majority of the parts required for the job are most likely available between the donor car and the Vauxhall benefitting from the transplant. The B204 I installed married up to the Astra's F20 five-speed gearbox without any hassle. I had no previous knowledge of SAAB conversions, yet I had a fully operational SAAB-powered Astra within six weeks of buying the donor car!"

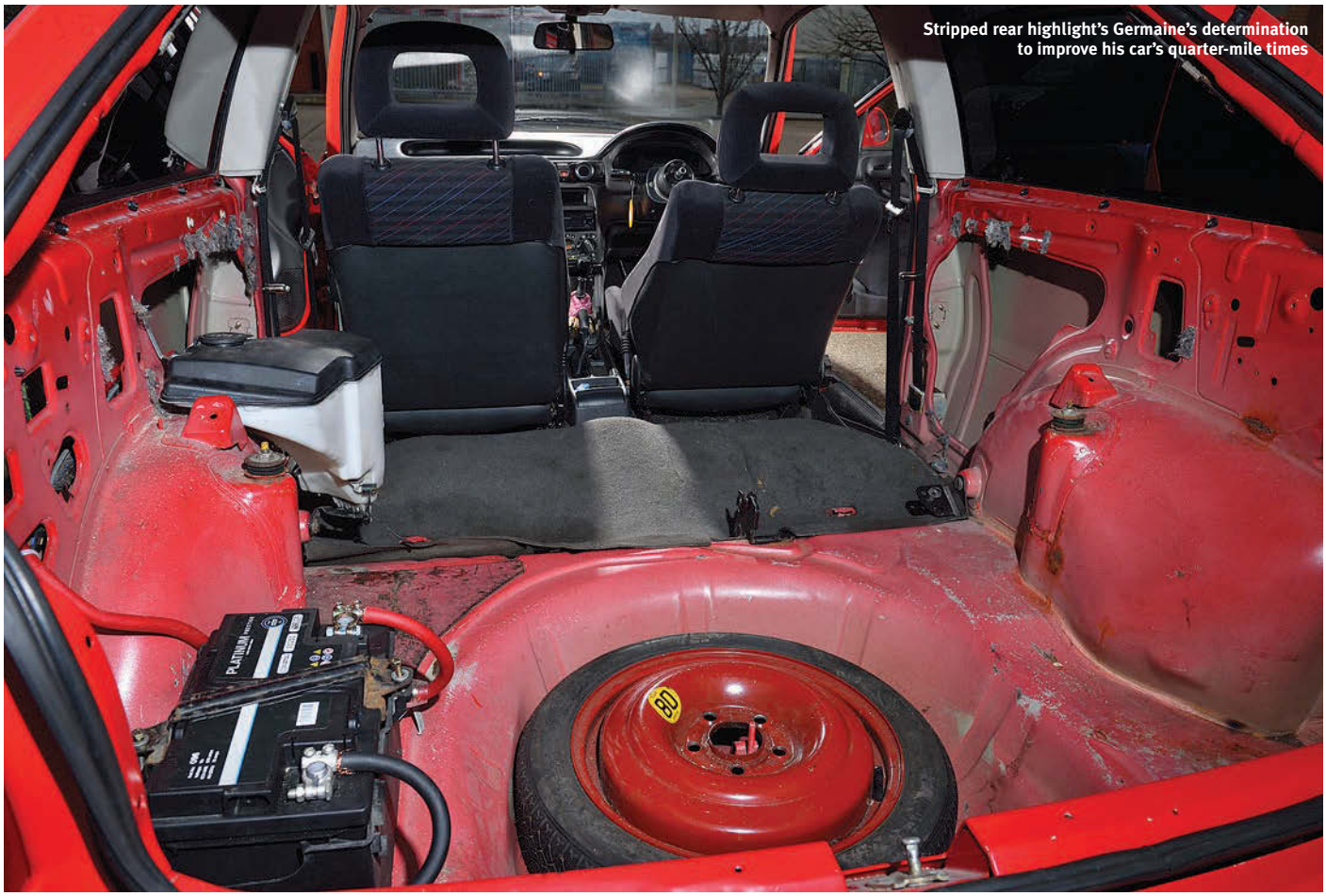
"The one problem I did enounter concerned wiring," he continues. "The SAAB loom falls into the same recesses as the Vauxhall's equivalent part, so that's fine, it's just a case of trying to get all the corresponding parts to work without error. I bought a SAAB workshop manual, which helped with wiring diagrams and the like, but I was still having difficulty getting the car to start. I discovered that the ignition live was being taken from the back of the ignition barrel, and every time I turned the key, I was removing feed from that wire! Once I'd worked out that ignition live wasn't permanent, I sorted proper wiring and the car fired up without any further complaint."

UNDER ATTACK

Sadly, the car was written-off in an unfortunate smash, and its replacement, a Corsa Sport, lasted only three weeks before being stolen. Drat. Germaine decided another Mk3 Astra was in order, eventually finding his current ride, the bright red '95-plate GSi we've come to look at outside the workshop of his car maintenance business, GS Automotive.

The GSi was already lightly modified, but it was mechanically standard. A couple of weeks of driving the car was all it took for its new owner to decide that a significant change was required, and so the B204 from the yellow Astra was fitted. "I added a Stage 3 map. Modifications snowballed from that point onwards!" he tells us.

Flame Red was in danger of turning Flame Pink. New paint was needed. Red was still Germaine's colour of choice, but the shade was up for debate. A handful of options were considered before he settled on the pigment plastered to the Fiat Stilo Schumacher, a risible special edition marketed to commemorate the Formula One legend's fifth consecutive driver's title. Every Stilo Schumacher was finished in the same colour. Fiat gave it the sexcellent name, '231.172'.



Stripped rear highlight's Germaine's determination to improve his car's quarter-mile times

SAAB 'Double Y' wheels hint at what lies within

OWNER

GERMAINE SHELTON
AGE 34
JOB Owner of GS Automotive
FIRST VAUXHALL
Mk3 Astra Merit
FAVOURITE VAUXHALL
VXR220
BEST THING ABOUT YOUR GSi
The paint job
MOST EXPENSIVE MOD
The Wössner pistons and PEC rods

We'll happily admit that a six digit paint code doesn't sound particularly exciting, but a little digging reveals that it's identical to Rosso Scuderia, the hue applied to Ferrari's factory race cars. It would seem the Stilo had some style, and now Germaine's GSi does too! It's a gorgeous colour, far removed from the *de facto*, formulaic Rosso Corsa of every 360 Modena in the metropolis. Scuderia pops under sunlight, radiating pangs of vibrant orange.

With a full respray and engine bay highlights in the same colour, Germaine's Astra grabs stares like little else. A striking US-sourced 'shave' door kit and gloss black SAAB Three-Spoke Double alloys set off the eye-catching aesthetic. And under the bonnet, the B204 – which expired part way through the build – has been replaced by a 2.3-litre B234 pulled from a donor 1995 SAAB 9000 before finding a new home atop SAAB subframes in the belly of the Astra. The engine features the posh parts of its predecessor and plenty more. Highlights include hefty Denso fuel injectors, Wössner oversized forged pistons, PEC connecting rods, an Abbott Racing flywheel, a Cosworth three-bar MAP sensor and Coolingmist water-methanol injection.

Around 450bhp ricochets through an Abbott Racing lightened flywheel, a five-paddle Drivetorque clutch and a Cavalier Turbo 4x4's Getrag F28 six-speed gearbox (another straight fit) before grinding through a Quaife ATB limited-slip differential to Toyo Proxes R888R front tyres. With a specification like that, you'd be forgiven for thinking this Astra was built for the trackday scene. Not so.

"It was never going to be a track car," explains the Griffin nut. "I wanted to build a car for the point and squirt. That's why it's got unbranded tyres on the rear axle. What use

Is any old-school modified Astra complete without a GTE digidash?!

would posh rubber be?! I didn't build the car to tackle corners." It was, however, assembled with the quarter-mile in mind, hence the GT30 turbocharger and a new map. Germaine's setting his sights on a low twelve second run with a trap speed of around 120mph.

You might remember seeing this radiant red rocket on the *Performance Vauxhall* stand at PVS where it attracted plenty of interest and appreciation, but don't think that Germaine has completed his Astra journey. "Is any project car ever finished?" he quips. "My goal is 500bhp. I should be able to achieve that power with a change of turbocharger and a twin-plate clutch. I need to upgrade the brakes too. K-Sport eight pot calipers are on the cards, with Omega discs or similar at the rear. The GSi's standard stoppers are shocking when being asked to cope with big power, even when the calipers are loaded with SAAB 308mm discs!"

NAME OF THE GAME

His is a GSi full of surprises. Is that a screamer pipe sticking out of the bonnet? Yep. Is that a Mk2 Astra GTE digidash? Sure is. Are those standard GSi Recaros? Yes they are. Germaine loves their mixture of comfort and support. What's that on the gear stick? His daughter's hair bands. There's a mod you won't see anywhere else! Most surprising of all, though, is that he didn't view his Astra as being anything particularly special prior to PVS. "My eyes were opened to how good the car is following positive feedback from people who took time to talk to me after they had a good look at the car when it arrived at the show," he admits. Proof, if proof were needed, that this B234-powered sprint star has hit the Swede spot!

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NEWSFEED

Vauxhall news registering on our radar

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VXR8 GTS-R ANNOUNC

THE MOST POWERFUL PRODUCTION CAR TO EVER WEAR A VAUXHALL BADGE

The new Vauxhall VXR8 GTS-R is powered by an evolution of the current GTS's supercharged 6.2-litre V8 engine, producing 587bhp and 546lb/ft torque, making it the most powerful production car to wear a Vauxhall badge in the company's 114-year history.

Production of the Holden Commodore, on which the GTS-R is based, comes to an end in Australia this October, when Holden's manufacturing plant finally closes. Vauxhall – a sister brand to Holden in the GM family – has been importing the VXR8 in various forms since 2007, and sells the car through selected dealerships in its network.

As befits its last-of-line status, the GTS-R is no ordinary VXR8 – and in this form it's exclusive to the UK, too! Sending drive via a limited-slip differential to the rear wheels, the GTS-R retains the previous GTS's clever torque vectoring system, but adds an upgraded brakes with six-piston monoblock calipers and 410mm discs. Additionally, the GTS-R wears all-new twenty-inch forged alloy rims (ten-inches wide at the rear, nine-inches at the front).

Visually, the GTS-R has a fresh front end, with a new front fascia, splitter, wings and carbon-fibre vents, while at the rear there's a new-look diffuser, spoiler (with carbon-fibre upper), lower panel and quad exhaust outlets with diamond-shaped tips. Inside, the diamond theme continues with beautifully trimmed leather and Alcantara, the latter wrapping itself around the GTS-R's dashboard and displaying special stitching.

The VXR8's current supercharged LSA engine has been re-mapped and fitted with a high-flow air filter to achieve its hike in horsepower (and a 0-60mph time of just 4.2 seconds), but just fifteen Vauxhall VXR8 GTS-R's will be available to buy. Listed with a an on-the-road price of £74,500, we don't suppose they'll be hanging around dealer showrooms for long!

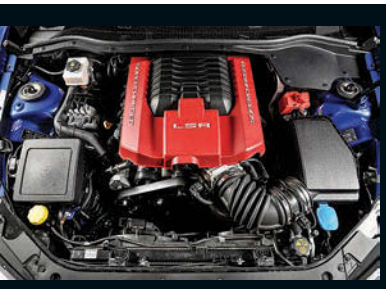
In addition to Side Blind Zone Alert with Reverse Traffic Alert, Automatic Park Assist, Front and Rear Park Assist, Reversing Camera and Passive Entry/Push Button Start, the GTS-R also picks up a number of additional driver convenience and safety technologies. Heads-Up Display (HUD) is fitted as standard. It shows a raft of driver information on the car's windscreen, such as current vehicle speed, engine temperature, and even G-force data!

Forward Collision Alert is another technology fitted standard to the GTS-R, and is the first system of its kind to be available in a Vauxhall product. A camera located above the rear-view mirror scans the road ahead up to fourteen times per second. When a crash is predicted, the driver is alerted by an audible

NEWS > SHORTS

*ONE FOR THE LADIES

Broadcaster, Kirsty Gallacher, is joining forces with Vauxhall to encourage the nation to get behind the women's football team this summer. Vauxhall is the sponsor of home nations football, and Gallacher has spent time penning catchy chants for fans to repeat on the terraces when they're watching the girls in action. Have a listen at *bit.ly/kirstyg*



ED

tone and graphics on the car's HUD. Anticipating hard braking, the system applies sufficient brake pressure to close the space between the brake pads and discs, thus delivering a quicker brake response time. Using the same camera technology, the VXR8 GTS-R also has Lane Departure Warning. Designed to combat driver fatigue, a warning indicator and audible sound alerts the driver to any unintentional lane departures.

We've been lucky enough to get hold of a GTS-R for testing. Keep 'em peeled for our forthcoming 'Dream Drives' feature. Subscribe and avoid missing out: *bit.ly/subscribepv*

VAUXHALL HERITAGE CENTRE OPEN DAY

Manufacturer lifts the lid on its classics

Vauxhall held its annual Heritage Centre open day a few weeks ago, an event timed to coincide with the Luton Festival of Transport. More than 300 turned out to have a look at the manufacturer's collection of classics, with the recently restored Viva HB GT and a collection of Victors (celebrating the model's sixtieth birthday) joined by the Heritage Centre's own Lotus Carlton. A range of activities for children included a bouncy castle, soft play, ride-on cars and face painting.

"It was great to see so many people at the event," said Vauxhall's Heritage and Events Officer, Veronica Borrelli-Painter. Many of those in attendance travelled long distances, but were able to take souvenirs away with them (no, not the Lotus Carlton) thanks to a well-stocked Vauxhall merchandise stand. We're looking forward to next year's open day already. See you there!

A small selection of the Vauxhall Heritage Centre's fantastic exhibits

VAUXHALL TAKEOVER BY PSA APPROVED

The European Commission has finally given the go-ahead for the highly publicised takeover of Vauxhall and Opel brands by France's PSA Group, maker of Peugeot and Citroen cars. The deal will mean that Peugeot becomes Europe's second-biggest carmaker (after Volkswagen), and will enable PSA to boost its presence in the UK before re-entering the US market, which Citroen left in 1974 and Peugeot exited in 1991. Giving "unconditional" approval to the transaction, the Commission looked at the overlapping activities of the brands and how they might have an impact at both European and national level. In conclusion, investigtors determined that the deal was unlikely to raise competition concerns from the likes of Ford, VW, Audi, Renault and Fiat. Onwards and upwards...

*GAME-CHANGING ASTRA K

Own an Astra K? Want to punish it around the world's greatest race circuits? Worried about the cost and damage of doing so? Well, providing you own a PS4, Xbox One or PC, you'll be able to drive as carefree as you like thanks to the inclusion of an Astra K touring car in *Project Cars 2*. Check it out at *bit.ly/projectastra*

*YOUNG AT HEART

Vauxhall recently launched a programme to help young drivers (aged 18-24) cover the initial cost of getting on the road. Offering a £1000 insurance contribution with the purchase of a new Corsa Limited Edition, the scheme highlights our favourite manufacturer's awareness of the lofty premiums faced by young drivers.

GEAR

facebook.com/PerformanceVauxhallMag @PerformanceVaux

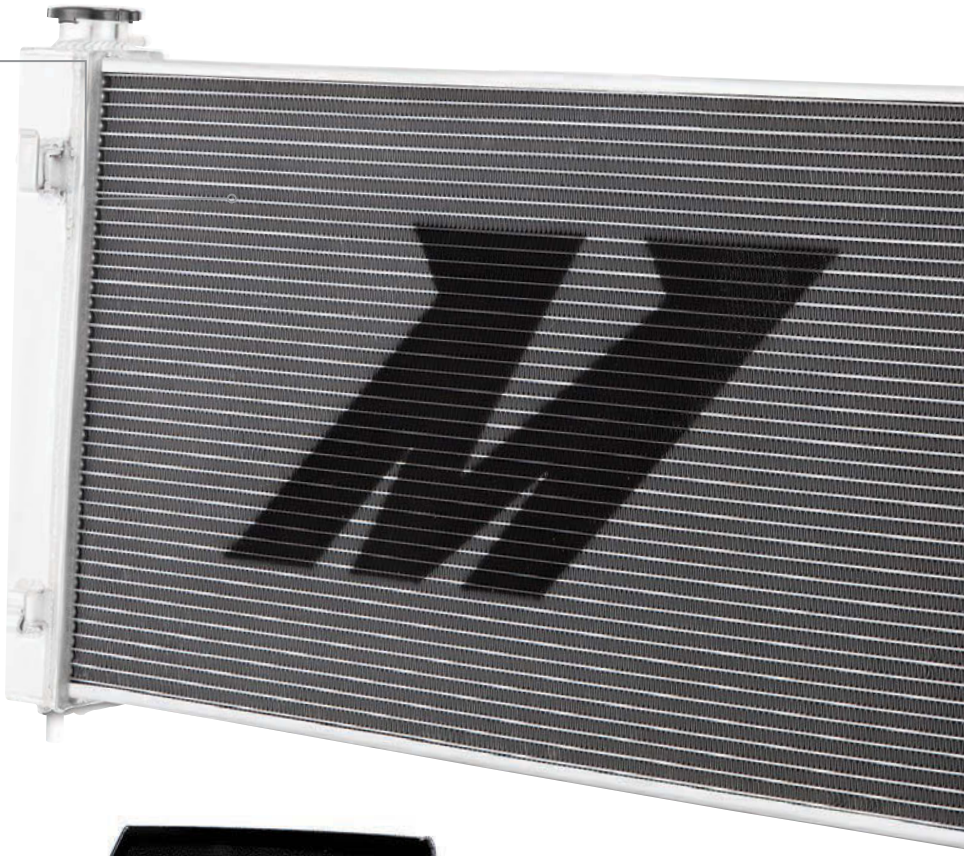
Hot products on planet Vauxhall...

MISHIMOTO ALLOY RADIATOR FOR MONARO

Stock plastic radiators are prone to significant wear from constant temperature variation. In contrast, Mishimoto's performance radiator for 2004 and 2005-06 Monaros is constructed from high-quality aluminium for optimal heat dissipation and superior reliability. This radiator features a large, efficient, and robust twin-row brazed aluminium core which provides optimal coolant temperatures whether you're driving on the street or the track. An in-tank transmission fluid cooler compatible with stock transmission cooler lines makes this a true bolt-on performance part. A magnetic drain plug is included, removing any metal fragments from your coolant system. For further protection, this radiator includes a 1.3bar high-pressure cap which effectively raises the boiling point of your car's coolant, providing safer and more efficient operation. A 0.64-litre increase in fluid volume allows for a proven reduction in coolant temperature of +6°C . And as we've come to expect from all Mishimoto products, these mega Monaro radiators come supplied with the company's legendary lifetime warranty.

PRICE £324

CONTACT 2004 MONARO *www.bit.ly/mishirad1*, 2005-06 MONARO *www.bit.ly/mishirad2*



FORGE MOTORSPORT CAR BADGES

Following demand from petrolheads keen to announce to the world that their cars are packing Forge Motorsport tuning equipment, the company has created high quality, cast, mirror-finished enamelled badges. Each badge measures 73x32mm and is backed by a strong adhesive strip suitable for any flat surface, making the products ideal for bodywork, interiors or engine bays. What these badges won't do, however, is add any extra horsepower, although Forge's extensive range of modifying gear should satisfy your requirements in that department!

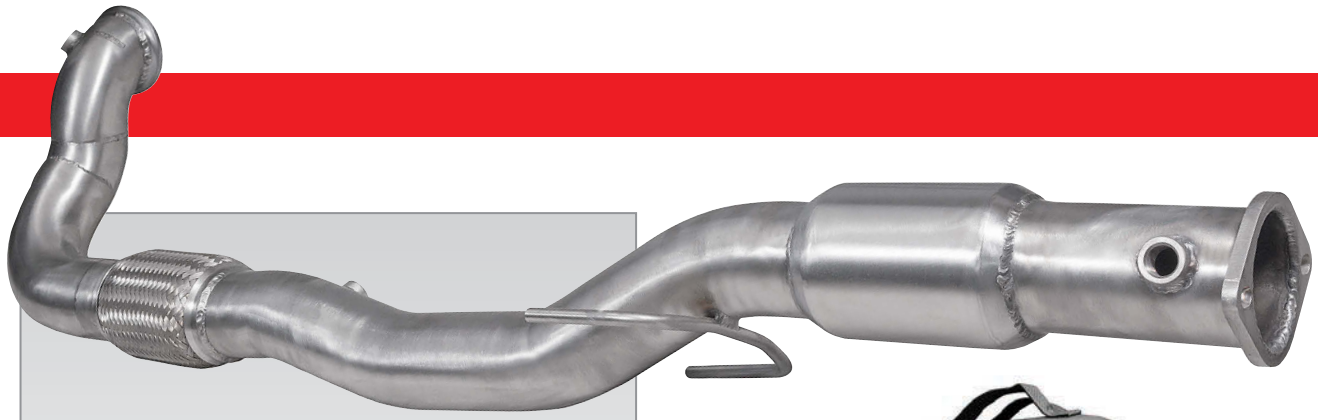
PRICE £11.99

CONTACT *forgemotorsport.co.uk*

TOYO PROXES SPORT

The Toyo T1-Sport has been one of its maker's most successful products, a tyre able to perform at the limit on the road in all seasons and conditions. This multi-faceted ability has made it a firm favourite with Vauxhall drivers, but never one to rest on its laurels, Toyo has wasted no time in drawing up a replacement in the form of the Proxes Sport, a tyre that delivers class-leading wet and dry weather handling with enhanced stopping and comfort. The Toyo Proxes Sport really is an astonishingly capable tyre, more than fit to follow on from the illustrious T1-Sport. Available in a wide variety of sizes and fitments (and suited to wheels ranging from seventeen to twenty inches in diameter), it'll no doubt prove itself to be a useful tool for any performance Vauxhall driven on the road, on a track... or both!

PRICE VARIES **CONTACT** *bit.ly/toyotiresuk*



COBRA SPORT EXHAUST FRONT PIPE WITH SPORTS CATALYST FOR CORSA E VXR

Designed to fit to both the Corsa E VXR's standard exhaust system and Cobra Sport's excellent Corsa E VXR cat-back exhaust system (thereby creating a full turbo-back performance exhaust system), this three-inch front pipe is manufactured from T304 stainless steel and features a high-flow 200-cell sports catalyst which significantly improves the flow of gas whilst still allowing your car to pass a UK MOT emissions test. All relevant fittings and gaskets are supplied with each guaranteed purchase, a move that will bring enhanced sound, looks and quality to your cool Corsa.

PRICE £617.51

CONTACT *bit.ly/cobracorsapipe*

MEGUIAR'S MIRROR BRIGHT DETAILING KIT

"Creating something new, but with a solid respect for the traditions of the past." This is how Meguiar's describes its new Mirror Bright detailing range, a retro-styled collection of car cleaning products that owes more than a passing nod to some of the firm's oldest research and development programmes. Available as individual bottles or as a kit presented in a specially-stitched carry bag, these fantastic fluids include wheel cleaner, detailing spray, polishing wax and shampoo. Each unique formula is designed to complement others in the range, and each is safe to use on all paint types, lacquers, enamels and clear coats. An optional Mirror Bright leather lotion and air freshener are also available to purchase at the Meguiar's online store.

PRICE DETAILING KIT £50, LEATHER LOTION £12, AIR FRESHENER £2

CONTACT *bit.ly/mirrorbright*

KROWN PREMIUM WASH CONCENTRATED SHAMPOO

Give your car an eco-friendly, high-foam clean with Krown's Premium Wash concentrated shampoo. Simply dilute a fifth of a cup of concentrate in five-litres of water, then mix, foam and wash. It's that simple! Easy to apply and equally straightforward to rinse off, the contents of each 500ml bottle last for up to thirty washes, making the £8.99 asking price an absolute bargain. The product is easy to get hold of too, with every branch of Halfords stocking it. Off to the shops with you!

PRICE £8.99

CONTACT *halfords.com*

IRMSCHER STYLING FOR ASTRA K

Vauxhall performance partner, Irmscher, has done itself proud with a newly-released range of exterior styling products designed specifically for the Astra K. Including a front splitter, a cross-hatch grille (with a choice of carbon or stainless steel upper trim bar), a 30mm lowering spring kit, decorative body stripes and twenty-inch Heli-Star alloy wheels decorated with an exclusive twin-tone finish, these premium parts will massively enhance the appearance of your seventh-gen Astra. For those in charge of Sports Tourers, additional product choices include tailgate loading edge protectors. Chrome or carbon-effect number plate holders are also available to order direct from the Irmscher website.

PRICE FROM £40.97

CONTACT *bit.ly/irmscherk*

PRODUCT SPOTLIGHT

AMSOIL SYNTHETIC OILS

Amsoil is the first oil brand to have produced synthetic oils, and now it's re-entering the UK aftermarket with a selected range of high performance engine oils, gear oils, additives and greases. The company is also bringing to market a special manual transmission fluid designed to protect and extend the life of your Vauxhall's gearbox while delivering slick and easy shifting. Outperforming conventional gearbox oils, Amsoil's offering is rated at between -40°F to 300°F, maximising energy efficiency and resisting the effects of heat, oxidation, sludge and varnish deposits.

Amsoil is known for developing synthetic lubricant technology designed for those who want to harness the full power of their cars. The company's engineers start by identifying inefficiencies in automotive hardware before they formulate and test lubricants designed to solve these challenges whilst offering a range of benefits, including increased protection of mechanical components. Testing takes place in-house as well as out in the field, with 'real world' studies involving the most demanding of applications (such as taxi fleets, wind turbines and race cars).

Over the years, Amsoil has remained loyal to the principles of its founder, Al Amatuzio. As a jet fighter squadron commander, he relied on excellence, integrity and strong leadership to forge a decorated and respected military career. In the early 1960s, he used those same traits to guide his newly formed company.

His breakthrough came in 1972 when Amsoil 10W-40 synthetic motor oil became first lubricant of its kind to meet American Petroleum Institute service requirements. Outperforming conventional oils on all counts, Amsoil's product provided maximum performance for motorists. It also signalled a new age in lubrication science.

Steady leadership and commitment to developing the best synthetic oils possible have driven Amsoil's growth ever since. The company remains steadfast in its commitment to developing lubricants that help its customers to get the most out of their vehicles and equipment.

For more information visit *bit.ly/amsoiluk* or call 02476 717100.

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PVS
THE PERFORMANCE VAUXHALL SHOW

WORDS Dan Furr **PHOTOS** Chris Frosin and Dan Sherwood

PERFORMANCE VAUXHALL SHOW 2017

Sun, fun and hardcore Vauxhall action made this year's PVS the best in recent memory...

Roger Guigno's 592bhp Astra van took pride of place on the *Performance Vauxhall* stand

Two very different flavours of Vauxhall track machinery

When it comes to car meets, weather can make or break your day out. As if to prove the point, compare and contrast last year's Performance Vauxhall Show with the same event a few weeks ago. In 2016, heavy rain hampered track action and left many with little choice but to seek shelter in their cars. In contrast, the blazing sunshine and summer heat experienced at this year's PVS allowed for an uninterrupted day of sprinting along Santa Pod Raceway's hallowed quarter-mile, not to mention leisurely wandering around the many club and trade stands exhibiting some of the best tweaked and tuned motors (and the parts that power them!) the Vauxhall scene has to offer right now.

Feedback from those of you who attended the event has been fantastic. A vastly improved layout featuring a bigger retail village and stands dedicated to showcasing special Vauxhalls was well received, as was a centrepiece that enabled us to exhibit close to fifty past, present and future *Performance Vauxhall* magazine feature cars. We were thrilled to have these magnificent machines gathered together, a collection that spanned more than four decades of sporty Vauxhalls, ranging from Mk1 Astras to VXR8s. The *Top Gear* reasonably-priced Astra was also a popular attraction!

A retro paddock paid tribute to classic GM metal, with highlights including a trio of Novas, a Calibra LE, a Firenza, Chevette HSRs and a Lotus Carlton. There were birthdays to be celebrated too, with ten of the best Cavalier Turbos brought together to mark the model's twenty-fifth year (more about that on page 32) and a gaggle of Corsa VXRs flying the flag for the model's decade-long reign as king of the superminis. Yes, you read that correctly. Ten years of Corsa VXR. Where has the time gone?!

Vectra VXR fan, Shania Austin, made a welcome return to the show following her dramatic departure from the event a year earlier. Many will remember she was in need of urgent medical assistance at PVS 2016 following an unexpected epileptic seizure that put paid to her weekend. She's been living with the condition ever since, but not even an epileptic episode the night before this year's show could stop the seventeen-year-old from returning to Santa Pod where she took to the quarter-mile in a battery-powered buggy, clocking a quarter-mile time of more than seven minutes!

As ever, the hotly contested PVS 'Show and Shine' competition served as a popular attraction, with Thomas Parkes' Cadbury's Purple Corsa B bagging top honours. Elsewhere, VX-Enthusiast won the EBC Brakes 'Best Club Stand' award, while special mention has to go to the Zafira VXR Owners Club who managed to bring together close to fifty boosted buses, thought to be the largest gathering of the model since it was launched.

In previous years, that'd be it for another twelve months, but with the highly anticipated Performance Vauxhall Show Rockingham taking place on Sunday 15th October, we're looking forward to enjoying octane-fuelled Vauxhall action all over again in just a few short weeks. And with plans already coming together for a bigger, bolder PVS at Santa Pod in 2018, the future's looking very bright indeed!

PURPLE REIGN

Congratulations to Thomas Parkes and his spotless Corsa B for staving off stiff competition to win this year's PVS Show and Shine award. Resplendent in pearlescent Cadbury's Purple, the car wowed judges with its immaculate engine bay, bright white leather and stunning Porsche D90 rims.

It's difficult to believe after looking at this cool Corsa up-close, but it started life as a grey 1.4-litre Sport that the 25-year-old breaker used as a daily after his name appeared on its logbook four years ago. A short while later, he began the process of stripping, refurbishing, restoring or replacing much of the car's key mechanical equipment, a move that saw the installation of a rebuilt C20XE engine and powdercoated suspension components. A Mk2 Astra GTE digidash and a beautifully-trimmed interior with colour-coded dash trim followed, as did a lot of spit and polish, enough for the guys from detailing concern, ValetPRO, to crown this cool Corsa as a worthy winner. Hoorah!

Daz Cox's Mk2 Cavalier SRi130 sparkled on the Autobrite Direct trade stand

Keep your eye on the track, mate!

A bird's eye view of the Pod party

Testing, testing. One, two...

SEVENTH HEAVEN

Graham Morley's Astra GTC VXR was one of the star attractions in the PVS retail village where the car took pride of place on the Cobra Sport stand. "I bought my GTC new in 2015 after owning and modifying a Mk5 Astra VXR," explains the HGV driver from Nottingham. Since taking delivery of the white wonder, he's fitted Rota GTR wheels, a Maxton splitter and genuine carbon-fibre trim, including custom door mirror cases. As its presence on the Cobra stand suggests, the car is loaded with one of the firm's superb turbo-back decat exhaust systems, kit that works alongside a Regal Autosport intake and map to release ponies to the tune of 326bhp. Graham tells us that a bigger air filter, a Forge Motorsport intercooler and updated ECU software are next on his 'to do' list, items that will help him in his quest to extract 500bhp out of the mint Mk7.

The Santa Pod jet car never fails to excite

The retro paddock featured classic GM metal

A FAMILY AFFAIR

We were thrilled to have Adam Beard's 973bhp twin-engined Corsa B back on the *Performance Vauxhall* stand at PVS. The car's appearance at the show took on extra significance this year due to it being paired with the 320bhp nitrous-injected, V6-powered, carbon-clad Corsa B Beardy built well over a decade ago. The wide-arched six-shooter first starred in print in 2004, with its last outing to PVS occurring two years later. Now in the hands of its creator's lad, Robert, the black beauty's return to the limelight signalled the first time father and son have exhibited at a show together. Keep 'em peeled for the dynamic duo and their killer Bs at events throughout the summer.

Look out for Ryan Davies' awesome Astra in our next issue

COBRA SPORT

"It's been a brilliant show. We've been very busy!" beamed Cobra Sport head honcho, Pete Jarvis, when we paid a visit to the Sheffield-based exhaust manufacturer's stand in the PVS retail village.

In addition to the various turbo-back and cat-back performance exhaust systems Cobra makes for Vauxhalls, the firm was on hand to promote its range of apparel, which can be ordered at the Cobra Sport website (*cobrasport.com*).

"We've been busy with the development of a new exhaust system for the Astra GTC 1.4 Turbo SRi," explained Pete. "There's a lot of demand for us to produce tuning equipment for the model alongside our VXR range," he added, highlighting the potential for big power out of Vauxhall's newest line of small engines.

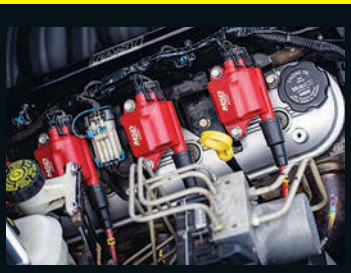
Cobra kit for Mk5 and Mk6 Astra VXRs still forms a good portion of the company's output, a fact highlighted by the welcome appearance of Suzi Stubbs' super-clean Astra VXR Arctic Edition on the Cobra Sport stand. Regular readers may remember the GCAP-built Mk5 from its recent 'Hall of Fame' feature.

On your marks. Get set. Go!

BLUE THUNDER

The Mk4 Astra GSi is a performance Vauxhall bargain right now, with well presented examples shifting for little more than a couple of grand. That's crazy when you consider how much car (and potential for seriously enhanced performance) you get for your money.

Shane Moriarty has owned his modified Arden Blue GSi for seven years, during which time he's fitted a Z20LEH with a gas-flowed head, an uprated valvetrain, a GTX3071R turbocharger, a Turbosmart Hypergate 45 wastegate, a Nortech tubular exhaust manifold, a Cobra Sport exhaust system, Alcon four-pot stoppers, an M32 six-speed gearbox, a Quaife diff and Astra GTC VXR leather. Complete with their blue stitching, the seats perfectly suit the Arden stunner. "I had to fabricate custom runners to make them fit," says the 32-year-old mechanic. "It was a nightmare job. I'd rather forge another engine than go through that again!" he laughs. His is a stunning example of a modern classic. Do yourself a favour and buy a GSi before prices rocket skyward.



So much win!

PERFORMANCE ENGINE COMPONENTS (PEC)

Pushing the performance potential of your Vauxhall's engine is likely to require the appointment of forged pistons and connecting rods. Dave Wheeler, owner of Performance Engine Components (PEC), was on hand at PVS to advise Griffin owners how to ensure they build engines that not only perform, but can withstand the stresses of hard driving. The PEC stand, located in the heart of the retail village, featured a display cabinet containing Wössner forged pistons, PEC rods, Supertech valve components and other products designed and sold by Dave and his team. The company's portfolio of parts covers Vauxhalls and Opels ranging from old-school CIH engines through to the latest VXR powerplants, not forgetting turbocharged and naturally aspirated Red Tops. Have a look for yourself at *steelconrods.co.uk*

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STAGE one

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- Sold as separates or save 15% if bought as a Pad+Disc kit.

STAGE two

PERFORMANCE PACKS (YellowStuff™ Pads & Lines)

TRACK PACKS (OrangeStuff™ Pads & Lines)

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- Kit includes free Super Dot 4 brake fluid and saves 10% on buying as separates.

STAGE three

NEW Balanced Brake Kits™

The ultimate full vehicle braking upgrade, delivering massively improved braking performance and feel whether used on road or on track.

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WORDS Dan Furr **PHOTOS** Dan Sherwood

TURBO ZONE

We hit Santa Pod with a gang of fellow Cavalier Turbo enthusiasts to celebrate twenty-five years of the legendary performance Vauxhall...

K312 PAB
M20 VXL
D20 TUB

Whenever we ask *Performance Vauxhall* feature car owners to list their favourite Griffins, it doesn't take long for the Cavalier Turbo to be name-checked (usually in the same breath as the Lotus Carlton and the mighty VXR8). Notwithstanding its brief spell as a Formula One course car, the model has nothing in the way of a motorsport pedigree, yet there's no denying its status as a Vauxhall legend, combining power and style with practicality and usability. Best of all, this mega Mk3 is highly tuneable and delivers a serious amount of fun thanks to model-specific leather, a turbocharged two-litre engine, a six-speed gearbox, independent rear suspension and four-wheel drive.

Seldom does a car have such a dedicated following of enthusiasts, although the Cavalier Turbo's low volume production has meant that modern day demand simply can't be met by the small number of surviving cars. Those of you who have been into modifying Vauxhalls for a while will know that the cool Cavalier's C20LET engine (arguably Vauxhall's most desirable powerplant) and its accompanying Getrag F28 gearbox were – and continue to be – the envy of those in charge of lesser Griffins, resulting in a huge number of Turbos being stripped for their vital organs before violated shells were despatched to the great scrapyard in the sky.

Back then, it was cheaper to kill a Cavalier Turbo for its guts than it was to buy them already removed, but the times they are a-changin', and the value of complete cars in excellent order has shot up dramatically in the last few years.

2017 marks the Cavalier Turbo's twenty-fifth birthday. We couldn't let this significant milestone pass without a celebration, which is why we got together with a group of likeminded fans of the fantastic 'fourby' to mark the occasion with a special photo shoot. The cars present spanned the entire spectrum of Cavalier Turbos, from spotless standard to mentally modified. Some of you may recognise former *Performance Vauxhall* feature cars in the mix! The line-up certainly included a diverse selection of Turbos, and we're pleased to have been able to gather together at least one of every factory colour.

If you like what you see, then be sure to have a look at our Cavalier Turbo buying guide on page 94. In the meantime, sit back and join us in wishing the greatest production Mk3 of them all many happy returns. Here's to the next quarter-century of Cavalier Turbo coolness!

DAVIDE RIMONTE

AGE 38
JOB Vauxhall technician
FIRST VAUXHALL
Corsa B 1.4 Sport
FAVOURITE VAUXHALL
My Cavalier Turbo!
BEST THING ABOUT YOUR CAVALIER TURBO
The RWD conversion
LEAST FAVOURITE THING ABOUT YOUR CAVALIER TURBO
It's been a challenging project, there's always something to fix!

TAHIR RASOOL

AGE 45
JOB Panel beater
FIRST VAUXHALL
Mk2 Cavalier SRi 130
FAVOURITE VAUXHALL
Mk2 Cavalier Calibre
BEST THING ABOUT YOUR CAVALIER TURBO
Its originality and colour
LEAST FAVOURITE THING ABOUT YOUR CAVALIER TURBO
Standard power

Flying the flag for Cavalier Turbos in completely standard specification is Tahir Rasool's immaculately presented Spectral Blue machine. This isn't the panel beater from Leeds' first Cavalier Turbo, and it's unlikely to be his last (he's got no fewer than three tucked away in various states of repair, cars that live at the Rasool residence alongside a low mileage Mk2 Astra GTE, a Calibra Turbo, a Mk5 Astra VXR Nürburgring Edition and a selection of Mk2 Cavaliers, including two Calibres and an SRi 130), but the chance to buy this K-reg rolling restoration was too good an opportunity to pass up.

"Over the course of a year, I refurbished or replaced many of the car's original components," says the Griffin nut. All new mechanical parts, a strip and full respray formed the main body of the restoration, with a mountain of genuine 'no longer stocked' parts finding their way onto the build.

Tahir's road to Cavalier Turbo ownership is a familiar one. "I owned GSi2000s prior to the launch of the Turbo. I wanted the newer model as soon as it was released into dealer showrooms! I had to wait a while, but I'm pleased to say that I've owned a few Turbos over the years. The model's specification was way ahead of its time, and it still holds its own against much newer cars today," he grins excitedly.

The only Turbo at our photo shoot without any aftermarket equipment or modifications onboard ("it's exactly as Vauxhall intended it to be"), Tahir's car went on to wow punters at PVS before doing exactly the same at the recent VBOA National Rally, where it was shortlisted for the coveted Chairman's Cup.

"I intend to keep the car how you see it today, ensuring that I get plenty of seat time in order to enjoy the fruits of my labour," says our man from North Yorkshire. We don't blame him. After all, there can't be many Cavalier Turbos left in 100% factory spec, and certainly none as well presented as this.

Davide Rimonte's Satin Red stunner was a completely standard Cavalier Turbo when he bought it seventeen years ago. Sadly, the car snapped its timing belt three days later. He decided there and then that he might as well rebuild with big bhp in mind. "400bhp was my target," he tells us. Make no mistake, that was a phenomenal number of ponies from a Vauxhall in a pre-VXR age. It's easy to forget how C20LET ECUs can't be reprogrammed like their modern day counterparts; as the cars featured here demonstrate, serious power from a 'charged Red Top usually requires a wide range of bespoke hardware.

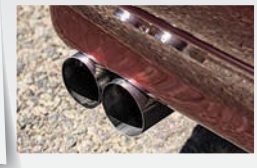
The Vauxhall main dealer technician's efforts to achieve high horsepower saw him reconfigure the car's airflow system. A custom inlet was designed and fitted. There was only one snag: the nearby alternator refused to return to its original position. Head scratching followed. So did beer. Lots of it.

"In my drunken state, I reasoned that lifting the engine out of the car and cutting the shell to pieces in order to allow power to be sent directly to the back wheels was less hassle than repositioning the alternator!" And why not, eh?!

A knackered Sapphire RS Cosworth was sourced (they were pretty cheap back then too!) and promptly relieved of its T5 gearbox. The unit was then mated to the fully forged, longitudinally-mounted Cavalier's engine by a TJ Motorsport bellhousing. A custom propshaft was made to allow power to feed from the Blue Oval 'box to a Harrop limited-slip rear diff. The Sierra's transmission tunnel and floorpan was also called upon to assist, as evidenced by the Ford centre console inhabiting the Vauxhall's leather-clad cabin.

Today, the car makes use of a GTX3076 twin-scroll turbocharger that enables the release of more than 530bhp from the heavily modified C20LET up front. Suspension duties are handled by GAZ dampers, while a HiSpec big brake kit can be seen behind Mille Miglia EVS nineteen-inch five-spokes.

The amount of work that has gone into transforming this particular Cavalier Turbo from a broken stock-spec car into the rear-wheel drive monster it is today is phenomenal, making it one of the greatest C20LET-powered Vauxhalls we've ever featured.



MIKE PRICE

AGE 33
JOB Car sales manager
FIRST VAUXHALL
Nova SR
FAVOURITE VAUXHALL
Cavalier Turbo
BEST THING ABOUT YOUR CAVALIER TURBO
The wheels
LEAST FAVOURITE THING ABOUT YOUR CAVALIER TURBO
It's too clean to use as a daily

"I've always been a fan of the Cavalier Turbo," confirms Mike Price. His admission goes some way to explaining why he bought the utterly stunning Glacier White example you see on the pages before you. The car features a stainless steel exhaust system (retaining rare OEM tailpipe tips), Eibach lowering springs, Black Diamond slotted brake discs and clear side repeaters, but it's that favourite wheel of C20LET tuners that makes this Turbo stand out even more than its pristine paintwork. "The Speedlines are my favourite aspect of the car, but I'm tempted to replace them with standard 'fanblades' when I embark on a full nut and bolt restoration of its chassis," he says.

Looking at the white wonder as it reflects blazing sunshine at our photo shoot on the hallowed ground of Santa Pod Raceway, it's difficult to comprehend how the car could be any cleaner than it already is, although therein lies Mike's frustration. "It's so tidy that I can't justify using it every day. I've been the car's owner for eight months, yet in that time I've clocked no more than three hundred miles!" he laughs, acknowledging the journey from his home in Wrexham to our gathering of Turbo fans accounts for a fair chunk of that mileage!

Much of his car's amazing cosmetic condition can be attributed to Daz Cox, himself a *Performance Vauxhall* feature car owner (PVS attendees will have seen his Mk2 Cavalier SRi on the Autobrite Direct stand in the show's retail village). The Turbo was his late father's prized possession. Darren committed himself to getting the car in tip-top shape when it seemed as though it would be a permanent feature of his garage, but with the SRi and a Mk5 Astra VXR Nürburgring Edition competing for space on the Cox family driveway, something had to give. Enter Mike and a generous offer that saw the Cavalier relocate to North Wales.

And for those of you wondering about the car's spark plug cover, a handful of late C20LET engines wore a black plastic insert decorated with the (in)famous ECOTEC logo. So now you know!

STEVEN COMRIE

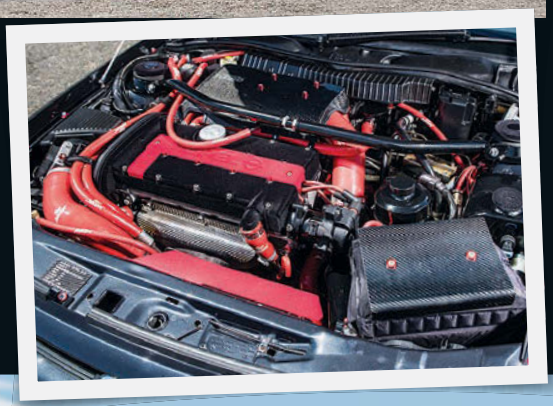
AGE 36
JOB Joiner
FIRST VAUXHALL
Nova Club
FAVOURITE VAUXHALL
Nova GSi
BEST THING ABOUT YOUR CAVALIER TURBO
The brakes
LEAST FAVOURITE THING ABOUT YOUR CAVALIER TURBO
The brakes!

When this humble bi-monthly changed its name from *Total Vauxhall* and relaunched as *Performance Vauxhall*, it was Steven Comrie's Diamond Black beauty that graced the cover of the first edition of the newly-branded magazine, and with good reason. His is a 340bhp Cavalier Turbo that has become well-known for its appearances on the show scene, whether it be Vauxhall-specific events such as the annual VBOA National Rally, or massive multi-marque get-togethers, inlcuding Birmingham NEC's Classic Car Show.

Steven has owned his Turbo since 2010. It was the logical progression from the naturally aspirated GSi2000 that preceded it. The joiner from Scotland has ensured that his love for the newer car has remained strong over the years by continually changing its specification. "I started by improving airflow with an EDS inlet, a bigger throttle body, an enlarged top hat and a free-flowing exhaust," he recalls. Since then, a wide variety of mechanical and cosmetic updates have been thrown at the car, including Wilwood four-piston brakes, Compomotive rims, genuine carbon-fibre trim, an exaggerated boot lip spoiler, a modified rear reflector panel, bonnet louvers and a modest aftermarket audio upgrade.

It is, perhaps, the presence of flocked timing belt, spark plug and cam covers that astonishes most when they look at Steven's pride and joy up close. Surely he risks ruining the attractive parts through spillage when topping up engine oil? Not so, as he explains. "It's a fireproof material rated to withstand 2000°C. It's also washable. I've spilled oil on most of the flocked parts. Furthermore, they attract dirt due to my determination to get plenty of use out of the car. I've cleaned the flock many times. It always comes up like new!" he beams.

His future plans include full powdercoating of his Cavalier's suspension components and mega rare Mk2 Astra GTE 'Champion' leather seats to replace the standard sports Recaros that currently live in his car's cockpit. Watch this space!



MARK BULLOCK

AGE 33
JOB IT network administrator
FIRST VAUXHALL
Corsa B SRi
FAVOURITE VAUXHALL
Lotus Carlton
BEST THING ABOUT YOUR CAVALIER TURBO
Everything is exactly how I want it to be
LEAST FAVOURITE THING ABOUT YOUR CAVALIER TURBO
Trying to keep the paintwork in mint condition is tough

ADAM HODGSON

AGE 35
JOB Garage door retailer
FIRST VAUXHALL
Facelift Mk3 Cavalier SRi
FAVOURITE VAUXHALL
Mk2 Astra GTE
BEST THING ABOUT YOUR CAVALIER TURBO
The locked transfer box
LEAST FAVOURITE THING ABOUT YOUR CAVALIER TURBO
There's always something about it that requires my money!

Adam Hodgson's Cavalier Turbo starred in its own dedicated *Performance Vauxhall* feature almost exactly a year ago. Regular readers will remember the Smoke Grey example for its classic C20LET mods, chiefly a VMAX EV05 ECU chip that works to extract close to 300bhp out of an engine with a GT28 turbo strapped to it.

"It's a top of the range Cavalier, definitely the model to own," says the garage door warranty manager. He should know. After all, his name has appeared on the logbook of pretty much every performance variant of the Mk3, including ECOTEC and Red Top SRis, turbo diesels, GSi2000s (including the ultra-rare 4x4) and a V6.

"What really sets the Turbo apart from other Cavaliers," he says, "is its four-wheel drive system. The difference felt when jumping into a genuine Cavalier Turbo 4x4 after piloting a front-wheel drive Cav is like night and day. It really is that pronounced."

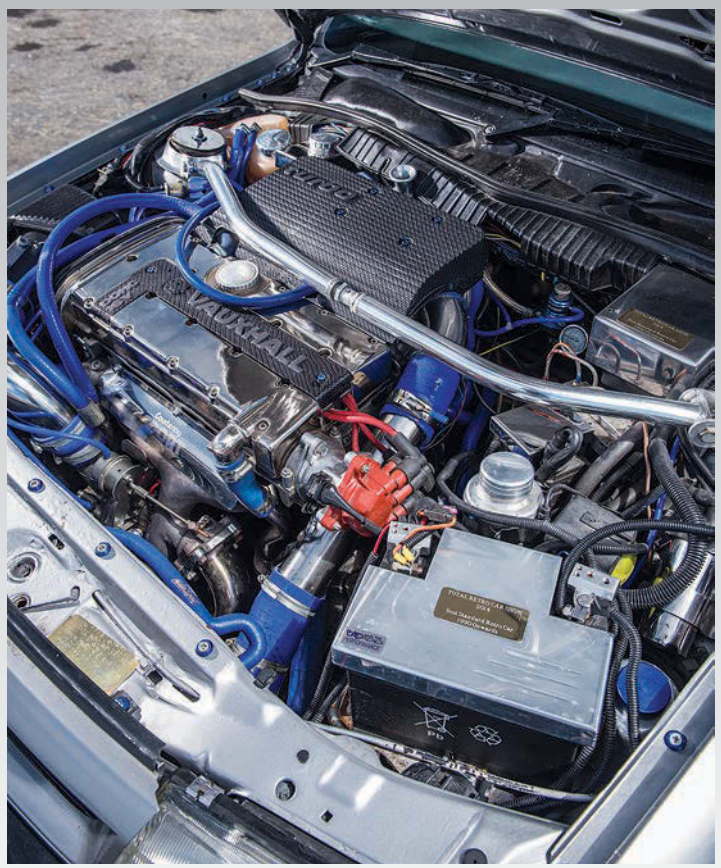
Adding to the surefootedness of his car's four-wheel drive transmission is a set of transfer box locking rings supplied by automotive engineer, Mike Hayward (*http://bit.ly/txbsolutions*). We wax lyrical about how these popular parts operate on page 99 of this magazine, but the short explanation is that they lock the model's transfer box, meaning that four-wheel drive is permanently engaged (the standard system disengages drive to the rear wheels under braking conditions). Adam cites this upgrade as his super saloon's strongest feature, a sentiment echoed by many Cavalier Turbo and Calibra Turbo owners when asked what modification has made the biggest improvement to the driveability of their cars.

This 310bhp Polar Sea Blue belter is regularly referenced as a firm favourite among admirers of modified Cavaliers. It's easy to see why. Owned by serial *Performance Vauxhall* feature car custodian, Mark Bullock, every aspect of this late 1994 Turbo has been treated to well thought through updates, from sensible engine upgrades (not limited to a rebuilt block, ARP fasteners, a Cosworth oil pump, a Turbo Technics double-sealed turbocharger and Roose Motorsport silicone hoses) to a striking interior that makes use of OEM Recaros complete with Alcantara centres, matching door cards and a similarly-trimmed MOMO steering wheel.

"I love the shape of the Cavalier Turbo," answers Mark when asked what he enjoys most about his car. "It looks great, and it's such a driveable performance Vauxhall. I grew up in awe of the model, so it was inevitable that I'd end up owning one," he adds. And what a Cavalier he's in possession of! Expertly resprayed (with the addition of red pigment) by OCS Paint, the car is one of the tidiest Turbos out there. As Tahir puts it so eloquently, "if you don't like Mark's car, then there must be something wrong with you!"

Down below, aftermarket chassis kit is in abundance; a Dorfbrunnen 'Racebox' transfer box with a dedicated oil cooler lives alongside a Bilstein B12 suspension kit (comprising B8 dampers and Eibach lowering springs) and swish AP Racing four-pot stoppers with two-piece discs housed behind gorgeous Speedline Mistral wheels powdercoated 'Dark Sparkle' and wrapped in Yokohama rubber.

"There's always something you can do to a modified car, but I'm satisfied that mine is close to how I always hoped it would be," muses the 33-year-old from Staffordshire. That may well be the case, but he can still identify find parts ripe for replacement, as evidenced in a recently installed custom headlining and colour-coded seat belts.



STE LOWIS

AGE 34
JOB Postal worker
FIRST VAUXHALL
Brand new Corsa C 1.2
FAVOURITE VAUXHALL
John Welch Astra 4S
BEST THING ABOUT YOUR CAVALIER TURBO
Its standard appearance
LEAST FAVOURITE THING ABOUT YOUR CAVALIER TURBO
Seeing the quality of Tahir's car!

223bhp isn't a huge lift over the 204bhp the Cavalier Turbo was blessed with when it rolled off the production line, but Ste Lowis's decision to keep his Diamond Black L-reg in more or less a standard state of tune has made it the envy of those who appreciate a minor nip or tuck here and there to bring the a formerly top-of-the-range Vauxhall up-to-date in terms of its performance and handling qualities.

"I've fitted Pi springs that drop the car's right height just enough to eradicate the wallowy handling Mk3 Cavaliers are known for. I've also added an EDS Phase 1 chipset to provide a little extra power," he says. Mike Hayward locking rings engage permanent four-wheel drive, while a Scorpion rear exhaust and an obligatory Renault Laguna front splitter can be seen at opposite ends of the car.

"The specification of the Cavalier Turbo is astonishing today, let alone when the model was first launched back in 1992," gasps Ste. "Sports leather, electric everything, optional air-conditioning, four-wheel drive, a six-speed gearbox, more power than a standard Ford RS Cosworth... it's a very capable car. It's comfortable too, even at top speed!"

Ste has owned his Turbo for a decade. Various top-notch Vauxhalls have come and gone from his driveway during that time (a Mk5 Astra VXR and an Insignia are the most noteworthy), but the modern classic that is Vauxhall's only C20LET-powered four-door saloon has remained. Little wonder when it's a specimen this good!

DARREN BRYCE

AGE 37
JOB Security operative
FIRST VAUXHALL
Mk3 Cavalier SRi
FAVOURITE VAUXHALL
I'd love an AWD Mk1 Astra GTE!
BEST THING ABOUT YOUR CAVALIER TURBO
Achieving big power
LEAST FAVOURITE THING ABOUT YOUR CAVALIER TURBO
Chasing big power!

What is it about red Cavalier Turbos that makes them so good at hitting high horsepower?! Hot on the heels of Davide's rear-wheel drive road warrior, Darren Bryce has employed the services of Chesterfield-based Noble Motorsport to tune his car to more than double its original power output. "It's currently producing 475bhp and 365lb/ft torque," he reveals. The release of all those ponies is made possible by a thoroughly rebuilt and upgraded engine, a Dewis Motorsport inlet plenum, a Turbo Dynamics TD05 turbocharger (mated to a Gary 'CrazyCage' Hughes flow-matched tubular exhaust manifold), an MBE 9A5 ECU, Deka 875cc fuel injectors and a just-installed Garrett front-mounted intercooler.

Coping with all that power is a fully rebuilt F28 gearbox complete with a shot-peened and superfinished gear set, all new synchros, seals and springs. The attached uprated transfer box features its own dedicated oil cooler and a strengthening plate. So far, the unit has coped admirably with what Darren's lead foot is asking of it.

Slowing the car is a HiSpec big brake kit, while Koni adjustable dampers, Eibach springs and a full complement of Powerflex polybushes keep the car on the straight and narrow. Interestingly, it's the only Cavalier Turbo to have joined us wearing the Morette headlights, a once popular cosmetic alteration that's accompanied here by smoothed front wings, smoothed bumpers and a full respray in Bordeaux Red. So long, Satin!

The car's front seats have been replaced by Recaro Sportster CS heated 'tombstones' that keep Darren fixed firmly in place as he hurtles towards even more power. "The goal is 500bhp and 400lb/ft torque," he smiles. "I don't care how long it takes to get there, but I'm determined to reach those figures!" Looking at the the rapid progress he's made taking the car from a tired, mildly modified Turbo to the powerhouse of performance it is today, we have no reason to doubt him.

KEV HODGES

AGE 42
JOB Vauxhall technician
FIRST VAUXHALL
1.6-litre Mk2 Cavalier
FAVOURITE VAUXHALL
Lotus Carlton
BEST THING ABOUT YOUR CAVALIER TURBO
The whole car
LEAST FAVOURITE THING ABOUT YOUR CAVALIER TURBO
Nothing!

The fact that two of the Cavalier Turbo owners who joined us at Santa Pod are time-served Vauxhall employees speaks volumes about the quality and many plus points associated with the model. "I work on new cars every day, yet my quarter-century old Cavalier affords me much more room to play with than the available space in and around a modern Astra's mechanical components. The Turbo is a brilliant design," says main dealer technician, Kev Hodges.

His Diamond Black K-plate confirms the argument that a set of wheels is all it takes to completely change the appearance of a car; his terrific Turbo is dropped on Irmscher springs and Bilstein dampers over Vectra C Phase 2 SP wheels. The eighteen-inch multi-spokes look fantastic and are plenty big enough to accommodate the Astra GTC VXR four-pot Brembos that he recently altered in order to fit his '90s automotive icon.

Lifting the bonnet of his car highlights the presence of a GT28 turbo strapped to a C20LET loaded with Piper camshafts, 1mm oversized valves, a 68mm throttle body, an EDS top hat, a front-mounted intercooler, a Scorpion exhaust, Aquamist water/methanol injection and VXR fuel injectors managed by an EDS Phase 3.5 chipset.

Other rare parts on the car include classic Vauxhall accessories, notably OEM headlamp protectors and a rear blind. "I love the Cavalier Turbo," exclaims the boy from Burntwood. "People moan about having to maintain its 4x4 system, but I haven't had any problem with the kit in my car during the thirteen years I've owned it. As long as tyre tread wear is monitored, then there shouldn't be cause for complaint," he says. Take note, prospective Turbo owners!

THANKS
Thanks to each and every one of the Cavalier Turbo owners who brought their car along to Santa Pod for the photo shoot. Top work, lads!

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BRAKE TIME

WORDS Dan Furr **PHOTOS** Various

When it comes to fast Vauxhalls, stopping power is just as important as being able to achieve high speed. With that in mind, we took time out in order to answer commonly asked questions concerning braking systems...

What are brake pads made of?

Brake pads are often made from a variety of different materials. Standard street compound pads are usually a non-metallic composite of synthetic properties. They offer excellent bite in the cold coupled with low noise when called into action, but they lack friction and their effect will 'fade' at relatively low temperatures when compared to performance pads.

At the other end of the scale, race compounds are usually fully metallic or ceramic in their make-up. Offering much higher levels of friction, these pads are lot less susceptible to fade, but they do need warming up in order to operate properly – their cold bite is poor. Great for the track or 'spirited' driving, but poor for nipping to the shops and back.

A good 'middle ground' is a sport compound pad. Made from semi-metallic materials, the cold bite is good and the warm bite is even better. You may get a small amount of noise depending on your driving style, but it's a small price to pay for big gains in friction and reduced fade. EBC Brakes offers pads to suit all applications.

Why is it important to change brake fluid regularly?

Glycol-based brake fluid is hydroscopic, meaning that it loves to absorb moisture. This is terrible for the continued effectiveness of brake fluid, primarily because it dramatically reduces the desired boiling temperature. Put it this way, just three percent water in DOT4 fluid can halve its boiling point! Over time, moisture can find its way into brake fluid via micro pores in a brake fluid reservoir filler cap, poor quality brake lines or compromised seals. Furthermore, moisture in brake fluid forms bubbles which causes spongy pedal feel. Don't ignore Vauxhall's recommended brake fluid service schedule.

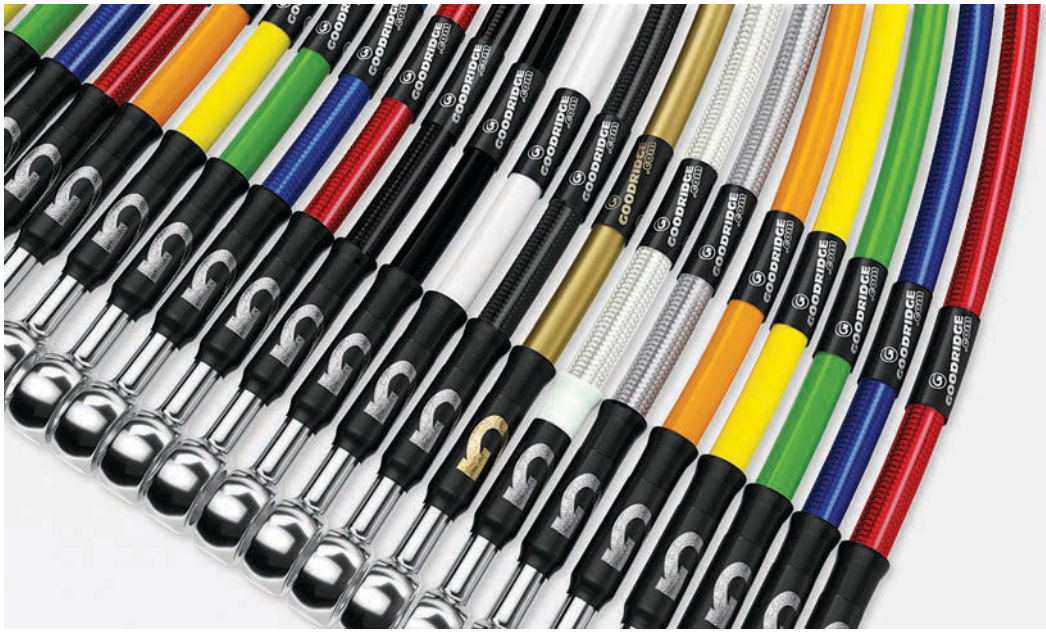
What does bleeding brakes do?

As is the case with moisture, air will find its way into your car's braking system over time, so it needs to be bled out, much like the air that occasionally needs to be released from the radiator in your living room. The biggest problem with having air in your Vauxhall's braking system is that unlike brake fluid, air is compressible.

AZGOLD
Snap-on
NEDVA
ADVAN

WHAT DOES 'DOT' MEAN WHEN IT COMES TO RATING BRAKE FLUID?

DOT is a system create by America's Department of Transport (see what they did there?!) to grade brake fluids based on their boiling points. DOT4 has a minimum boiling point of 230°C, more than enough for street driving. DOT5 has a much higher boiling point, ideal for racing. It's worth noting that DOT5 fluids include silicone-based ingredients, so check to make sure your Vauxhall's braking system is compatible before shelling out.



This causes 'spongy' pedal feel. If left unattended for significant periods of time, complete brake failure may occur. Bleeding the brakes allows the air to escape. Good riddance!

Why are bigger discs more effective than smaller discs?

When you increase the diameter of a disc (and change your car's calipers accordingly) the amount of braking torque exponentially increases. In theory, the bigger the disc, the faster you'll stop, but you're limited by how much grip your Vauxhall's tyres will allow. For example, depending on the quality of the tyre you've bought, discs over a certain size will force you to brake so hard that a loss of tyre grip encourages ABS to kick in (if the car is new enough to be equipped with the feature!). Keep in mind the fact that brake discs are very heavy items which may affect the effectiveness of your car under acceleration. Of course, the recommended size of discs depends on the model of Griffin you own and your driving style, but generally speaking, the short answer to the question is that heavy cars require large discs for effective braking, while lighter cars can get away with running smaller discs.

Why do people fit braided hoses?

Braided hoses, such as those made by Goodridge, feature a Teflon inner wall with an outside layer comprising strands of braided stainless steel designed to offer massively increased safety and durability over factory rubber hoses. Furthermore, OEM hoses tend to expand during operation, whereas braided hoses retain their shape, allowing for a much firmer pedal feel. A firmer brake pedal means better feedback and better braking.

Ceramic brake discs are ordinarily the reserve of supercars

Why are ceramic brake discs so ridiculously expensive?

Ceramic discs are made from a compound of carbon and ceramic materials. The manufacturing process is complicated and drawn out. A single disc can take up to a month to produce! Ceramic discs are ordinarily only used in ultra high performance applications. Disc manufacturers won't admit it, but supercar tax may be at play!

What's a hydraulic handbrake?

A hydraulic handbrake replaces a car's conventional cable-operated part by connecting to the main

Nice anchors, mister!

WHY DO MANY PERFORMANCE BRAKE DISCS FEATURE GROOVES?

Grooved discs look good and aid heat dissipation

There are a couple of reasons for having grooves (or slots) and/or drilled holes in your car's brake discs. Firstly, the friction created between pad and disc under load produces a lot of heat. Toasty temperatures can lead to brake fade. Grooves and holes allow heat to escape. They also help to channel water, dirt and other unwanted materials away from the contact surface of the disc, thus maintaining maximum friction. EBC's Ultimax design is a great example of a powerful grooved disc.

braking system and using the same hydraulic pressure to clamp the rear calipers. The advantage of a handbrake of this nature is its immense power, but it's illegal for street use and will reward you with an MOT failure if you don't obey the rules. You have been warned!

Why are they outlawed?
In addition to keeping your Vauxhall in place when you've parked it on a steep incline, a handbrake is considered to be your car's 'emergency' brake (a kind of backup in case your main braking system fails). The law states that a road car's handbrake must be cable operated and fully independent from the main stoppers in an effort to avoid disaster in the event of a major braking system failure. Difficult to argue with that logic, isn't it?!

Why are fixed calipers regarded as being better than floating calipers?
Many modern cars come with floating/sliding calipers loaded with one or two pistons. When hydraulic pressure from the master cylinder forces the piston against the pad, the whole caliper is pulled inwards as the pads clamp down on the disc, hence them being referred to as 'floating'. A downside to this mode of operation is that the pads on the outer side of the caliper tend to wear unevenly. Another is that since the pistons need to travel so much, the brake pedal can feel unresponsive. Fixed calipers, like those on many sporty Vauxhalls, feature multiple pistons on each side. Since the pistons are clamping from both sides, the caliper doesn't need to move. It remains fixed in place. This allows for much more even pad wear, more effective braking and a firmer, more responsive pedal feel.

Why are two-piece discs considered to be better than single-piece discs?
The last thing you want when flying down a straight at 100mph and slamming on your car's stoppers is sudden brake fade. Two-piece discs come supplied with aluminium centres often referred to as 'bells'. Surprisingly, the contact area between the disc and bell is minimal. This is great for heat dissipation and makes the disc very light. More often than not, however, a brake kit of this nature is overkill for a road car. Furthermore, you may need to invest in a bigger set of wheels to accommodate the increased size of bigger calipers and their supporting brackets. Two-piece discs are a great idea for a Vauxhall that doubles up as a track weapon, though. They look cool too, especially with anodised centres.

I want to impress the ladies. How do I go about performing the perfect handbrake turn in my new Corsa?
We've often pondered the same question. Ask Ken Block. Let us know what he says.

WHAT IS A MONOBLOC CALIPER?

A monobloc caliper, such as those available to buy from KSport, is a brake caliper machined from a single piece of metal, ordinarily billet. This design differs from two-piece calipers which are essentially two 'halves' bolted together. No matter how tight the bolts are between these two parts, they can shift under extremes of stress and heat. Force generated by the foot pedal and master cylinder can be wasted spreading a two-piece caliper apart. This can result in increased pedal travel and inconsistent pad wear.

CONTACT

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The Forged Monoblock technology is standard on all front and majority of rear KSport brake kits from 286mm up to 444mm.

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Every step forward in reducing caliper flex can be felt directly through the drivers foot as an improved and firmer pedal, with more immediate braking response. Excessive pedal movement is often due to the caliper halves flexing apart, whereas the KSport Forged Monoblock design ensures all pressure applied to the pedal is transferred directly to pushing the pads against the rotors.

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DREAM DRIVES

GRIFFIN GREATS

We drove 113 years of performance Vauxhalls... in a single day!

WORDS Dan Furr **PHOTOS** Dan Sherwood and Simon Collins

Vauxhall can trace its roots back more than 160 years to when it was founded as a pump and marine engine manufacturer in 1857. The company changed hands in 1863, was swiftly named Vauxhall Iron Works and become known as a maker of travelling cranes thereafter. It wasn't until 1903 – coincidentally, the year Ford Motor Company was established – that Vauxhall built its first car. The 5HP (guess how powerful it was!) single-cylinder machine was steered around corners by way of a tiller, the kind of lever you might expect to find controlling the rudder of a boat. The car featured two forward gears, no reverse and no damping suspension. Just a single 5HP is thought to have survived to the present day. In case you were wondering, it has no VXR button.

The 6HP was introduced to the world in 1904. Vauxhall is lucky enough to have one of the earliest examples of the car in its Heritage Centre collection. Costing £150 when new, JNM400 is one of just seventy 6HPs made in the model's first year of production. It's fully restored, and has participated in the London to Brighton veteran car run no fewer than fifty-three times. It'll hit 25mph downhill, but believe us when we tell you that travelling at this low speed feels like 300mph in the bright green *al fresco* machine. How do we know? We took it for a spin, that's how!

SUPER MODELS

There are few car companies that can put you in a 113-year-old model packing six ponies, tiller steering and chain drive before letting you go nuts in a supercharged V8 ute with 536bhp, but thanks to Vauxhall's determination to keep all of its Heritage Centre fleet in a fully operational state, we were lucky enough to be able to spend a day sampling a selection of the manufacturer's most significant sports cars. With the keys to the 'family jewels' laid out before us, all that was left for us to do was decide which motors to take for a drive!

Bicester Heritage (*bit.ly/bicesterh*) provided the backdrop to our day of fun in the sun. Surrounded by fantastic driving roads in the heart of Oxfordshire, the former RAF base is Britain's newest Centre of Excellence for the rapidly

Whaddya mean 'there's no steering wheel'?!

The Heritage Centre's Lotus Carlton has covered just 32k miles

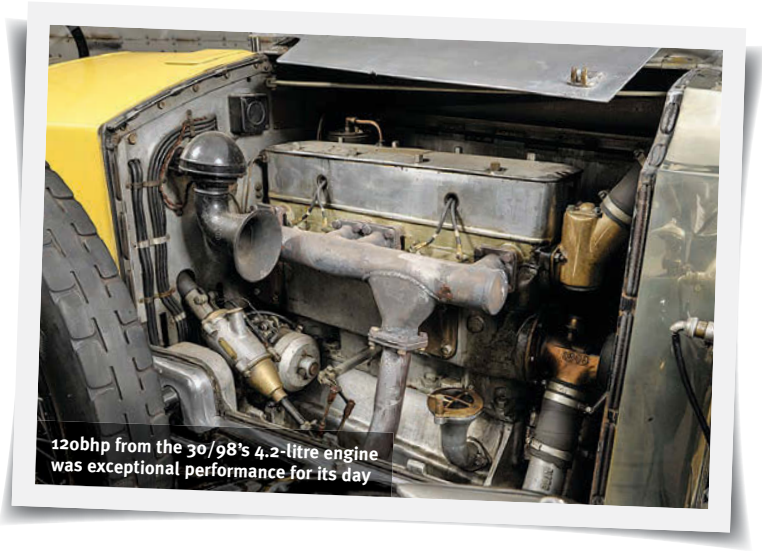
Parp, parp! Editor coming through!

growing classic car industry. More than thirty related on-site businesses form a hub of skills and enterprise concerning vintage automotive and old-school aviation activities, with a working airfield and race track buzzing with action each and every day of the week.

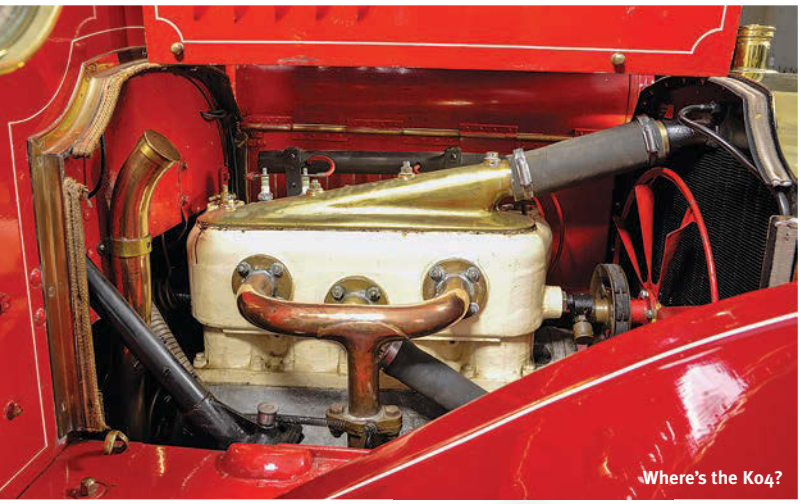
Driving our project Vectra VXR through the site in order to get to the aircraft hanger that housed the fleet we'd come to enjoy took us through a maze of listed outbuildings, each housing a company specialising in services relating to historic race car or aircraft preparation. Interestingly, this is where the Benedict Cumberbatch movie, *The Imitation Game*, was filmed. It's a fantastic place to be.

We couldn't help but take a peek through the open door of each workshop we passed, spotting classic Porsches, old Bentleys, Minis and Bugattis being worked on. These cars became a distant memory, however, the moment we spotted a 6HP, B-Type, Prince Henry, Viva HB GT, Lotus Carlton and Maloo R8 waiting to greet us!

In fact, we had no fewer than seventeen different vintage Vauxhalls at our disposal, but with just a day to enjoy them all, we decided to focus our attention on the performance models present. We tackled the fleet in chronological order, starting with the 6HP, one of only two cars in the Heritage Centre collection built at Vauxhall's original London site.


120bhp from the 30/98's 4.2-litre engine was exceptional performance for its day

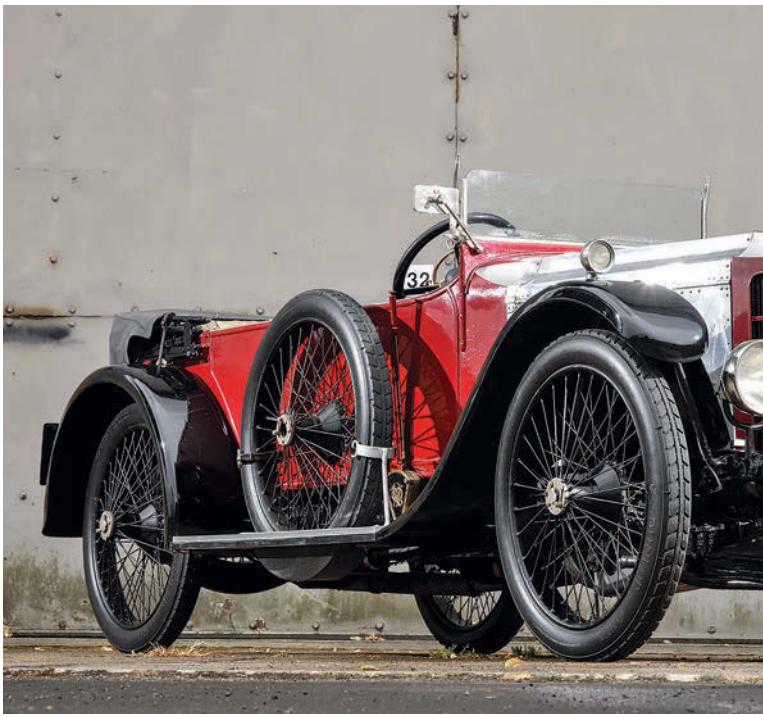
The B-Type was a popular hill climb machine


Where's the Ko4?

The first thing we had to do is forget everything we thought we knew about driving. The tiller steering is strange enough (it's incredibly responsive, and will set you on an entirely unexpected course with the slightest input error), but what looked to be a familiar pedal arrangement turned out to be anything but. What you'd think is the clutch pedal is actually first gear engagement and drive, with throttle and second gear operated by a lever attached to the tiller arm. The 6HP's crude braking system is managed by the remaining foot pedal. It sounds simple, and we'll admit that moving forward in a straight line isn't the most taxing of affairs in a 6HP, but having to navigate your way around corners, traffic or obstacles in the road while operating an alien set of controls is a something of a challenge. Much to the amusement of Heritage Centre technician, Terry Forder, it really did seem as though we'd never driven a car before!

ONE OF A KIND

If the 6HP represented Vauxhall's first steps in the automotive world, then the next car we drove signalled the company's early motorsport aspirations. One of approximately 150 built, the Heritage Centre's 1909 B-Type is widely believed to be the sole surviving example. Powered by a 2.3-litre four-cylinder side-valve engine producing a whopping 16bhp, the car cost £360 new (about £40k in today's



"BUILT BETWEEN 1923 AND 1927, THE 30/98 WAS SOLD WITH A WARRANTED TOP SPEED OF 100MPH"

30

You're looking at what was the fastest catalogued car in Britain

The Vauxhall Prince Henry is the world's first proper sports car

Steering wheel features lever-operated ignition control

money). Its transmission comprises three forward speeds plus reverse, while an external handbrake clamps the rear wheels. In 1959, *Motor* recorded the then fifty-year-old B-Type's maximum speed as 50.1mph. It took 29.1 seconds to get there.

The car feels more familiar than the 6HP (primarily due to the presence of a steering wheel!). It's a lot of fun, and delivers a much smoother ride than the earlier Vauxhall, although a continued lack of shock absorbers provided a fairly bouncy time for myself and Terry's colleague, Andrew Boddy, as we hurtled along Bicester Heritage's race track.

In its day, the B-Type proved

The Heritage Centre's restored Viva HB GT is simply stunning

Slant Four is a Vauxhall classic

to be a popular hill climb machine, and the huge variety of bodywork and trim options available to Vauxhall's customers made the car an attractive proposition to a public hungry for high-octane adventure. The B-Type helped the manufacturer to forge a reputation for producing vehicles with a sporting flavour, a standing it nailed with the arrival of our next ride, the extraordinary 'Prince Henry'.

The most famous Edwardian Vauxhall of them all, the Prince Henry was built to compete in the 1910 German time trial of the same name, a competition designed to discover the world's best all-round touring car. The three-litre Vauxhall has since been recognised as the world's first proper sports car due to the fact that its high performance relies less on brute strength and more on overall excellence of design (the car's pointed radiator is an early exercise in aerodynamics), mechanical reliability and sturdiness of construction.

RARE ROYAL

Only seven Prince Henrys survive today. The bright red example we were lucky enough to experience is the oldest of those still in existence. It's been part of Vauxhall's Heritage Centre collection since 1946 and is thought to be a pre-production car tuned and raced before the 'on sale' version was catalogued for the 1912 model year.

As was the case with the cars we drove before climbing inside the Prince Henry, a baffling foot pedal arrangement is present. Where the brake pedal sits in a modern car lives the Prince Henry's throttle control. It's actually more of a button than a pedal, and pressing it releases a cacophony of sound from the 60hp three-litre engine up-front. Imagine the deafening noise of a Supermarine Spitfire and you're on the right track!

The car's multi-plate clutch is more 'on/off' than that of a Time Attack Astra. Releasing it propels a tonne of 107-year-old metal forward at full pelt! Our driving instructor (and Prince Henry aficianado) David Kirke, told us that the car will easily reach 90mph, performance that enabled it to win challenging speed trials at Brooklands at its original point of sale.

The OE-Type 30/98 soon stole the Prince Henry's thunder. The newer Vauxhall was pitched as the fastest catalogued car in Britain. Built as a tourer between 1923 and 1927, it was sold with a factory-warranted top speed of 100mph, a level of performance that was unheard of from a production car. Only 600 30-98's were built, yet a staggering 170 survive to the present day. Many of them are still in regular use!

4.2-litres of fury release 120bhp, but a centre throttle, an extremely heavy flywheel and weak brakes make driving the car a challenge on modern roads. It was time for us to hop into a more modern performance Vauxhall.

The first thing we noticed when firing up the Series 2 Viva HB GT recently restored by Andy and Terry is how similar the sound of its two-litre Slant Four is to the engine of the Prince Henry! The car was worked on over a two year period in the Heritage Centre workshop, and is thought to have been called into service as a Vauxhall company car immediately after it rolled off the production line in 1970.

Lotus Carlton mission control

377bhp, bags of torque and twin turbos

"IT'S DIFFICULT TO BEAT THE FEELING OF BEING AN EXTENSION OF THE IMPERIAL GREEN GIANT"

The lads have done an amazing job of the restoration, and we thoroughly enjoyed hitting Bicester's B-roads in the Monza Red marvel.

LOOKING BACK

GTs have substantially different engine, running gear and interior from standard Viva HBs. Complete with distinctive bonnet scoops, the model is noted for its motorsport success in the hands of racing driver, Gerry Marshall, and tuner, Bill Blydenstein. Channeling the spirit of these two giants of the Vauxhall racing world, we loved throwing the H-plate two-door into the twists and turns presented to us by the rural road network we found ourselves on, although a lack of door mirrors and a notchy four-speed gearbox did take a bit of getting used to!

The GT's cockpit screams '1960s race car', a sentiment carried by the model's side stripes, sporty dampers and Rostyle wheels. More than 13,500 GTs were made during a two-year production run ending in 1970, meaning that the vivacious Viva is a tad easier to get hold

The world's most powerful utility vehicle

of than many other performance Vauxhalls. We had so much fun that we found ourselves scanning eBay almost as soon as we stepped out of the car. Not that we remained glued to our phones for long. After all, we had a date with a Lotus Carlton to attend!

LIVING LEGEND

How times change. Seventy years before the Lotus Carlton was launched, Vauxhall was being lauded for bringing the 100mph 30/98 to market, yet in 1989, the company's chairman, Paul Tosch, was being hounded in the press for launching a family car with a top speed of close to 180mph encouraged by a 3.6-litre straight-six engineered by Lotus and fed by twin Garrett T25 turbochargers linked to a duo of intercoolers. Even while carrying four passengers, the crazy Carlton (the world's fastest four-door saloon), could outrun most luxury sports cars. Vauxhall had created a modern classic. The tabloids called it a monster.

377bhp and 419lb/ft torque is still respectable by today's production performance car standards, but the Lotus Carlton's reputation as "the car they tried to ban", plus the imposing nature of its typically '80s chunky body kit, makes it just as awe-inspiring today as it was when launched to unsuspecting public almost thirty years ago. So what's it like to drive?

536bhp of fire-breathing, supercharged, eight-cylinder anger

Make no mistake, the Lotus Carlton is a comfortably quick car, but it pulls a lot of weight and suffers from the effects of lag. The car's standard dampers are 'wallowy', much like the shocks fitted to other performance Vauxhalls of the era (hello to all you Cavalier Turbo owners!), and its brakes – four-pot AP Racing calipers hidden behind seventeen-inch Ronals – could do with an extra couple of pistons on each side. That said, this is a superbly assured and blindingly fast car, and one that that would take pride of place in the dream garage of many whose blood has its own octane rating.

We absolutely love the Lotus Carlton, and we'll be presenting a more detailed showcase of its abilities after we pair it with the VXR8 GTS-R in the coming weeks. We're looking forward to getting behind the wheel of the 587bhp Aussie bruiser (see this issue's news pages), especially after we were reunited with its older stable-mate, the Maloo R8, at the end of our day of fast-road fun. Equipped with the same 6.2-litre supercharged LSA V8 as the super saloon, the ute produces 536bhp.

Putting the pedal to the metal immediately highlights how much automotive technology has moved on since the day of the Lotus Carlton. The R8 remains surefooted at all times, with no body roll experienced around high speed bends, even when a linear delivery of power rockets through the rev range. The noise generated by the eight-cylinder powerplant beneath the snarling front end of the blown beast forces a grin to spread from ear to ear. Let's not forget, this is the world's most powerful utility vehicle, capable of hitting 60mph from a standing start in less than 4.5 seconds!

NEXT IN LINE

From a technical perspective, a dizzying array of modern driver aids, interactive menus and selectable 'modes' make the R8 more of an involved drive than the Lotus Carlton, but for sheer sensory pleasure, it's difficult to beat the feeling of being an extension of the Imperial Green giant when you're sat in its pilot's seat. In fairness, each of the cars we drove offered something different to the others, all of them highlighting Vauxhall's long and colourful history of presenting groundbreaking performance cars. And with the recent PSA Group takeover heralding the start of a new chapter in the story of our favourite manufacturer, we can't wait to see what Griffin greats we'll be driving in the years ahead.

GRANDLAND X

We were lucky enough to get a 'world first' look at the all-new Grandland X during our time at Bicester Heritage. Presented by the crossover car's designer, Richard Shaw, Vauxhall's director of communications, Denis Chick, and the company's CEO, Rory Harvey, the highly-equipped Griffin is poised to take on the VW Tiguan and the SEAT Ateca in the mind-bogglingly popular SUV market. Grandland X is set to make its public debut at the Frankfurt Motor Show in September, and is the first Vauxhall to emerge since the company's takeover by PSA Group. More detail to follow in the next issue of *Performance Vauxhall*.

Dan with Vauxhall's director of communications, Denis Chick

TELL US ABOUT IT!

Get in touch if you want to tell us about an exciting driving road packed with thrills, spills and activities that you think we should share with the world. Fire up your 'puter and email *dan.furr@kelseymedia.co.uk*

THANKS

Andrew Boddy, Terry Forder, Pam Meegan, Laura Margott, Simon Hucknall, David Kirke and Veronica Borelli-Painter

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WORDS & PHOTOS Dan Furr

VBOA NATIONAL RALLY 2017

Griffin fans far and wide travelled to Market Harborough Showground to enjoy one of the best weekends on the Vauxhall calendar...

Most of us involved in the Vauxhall scene expressed alarm at the decision taken by new management at Billing Aquadrome to dispense with automotive events at the popular Northamptonshire holiday park. The announcement came at the back end of last summer (without affording show organisers enough notice for each of them to make suitable arrangements at an alternative venue in time for their next big gathering). It looked as though the writing was on the wall for many long-established Billing-based events, not least of all the Vauxhall Bedford Opel Association (VBOA) National Rally.

The scale of the VBOA show means that the venue managers who were approached with a request to accommodate the 2017 bash had to decline on the grounds of not being able to cater for the volume of cars expected to attend. After all, what's known to be one of the most popular events on the Vauxhall calendar has attracted close to 3000 vehicles in recent years, many of which make their way to the show from overseas. Fortunately, help was at hand.

"I could see the struggle the VBOA was facing," explains Steve Crook, top dog at Griffin parts retailer, LMF Vauxhall (*lmfvauxhall.co.uk*). "A friend of mine owns the recently established Market Harborough Showground. I spoke to him about the possibility of hosting the VBOA National Rally with LMF providing necessary ticket ordering infrastructure. The VBOA responded positively to the suggestion. Consequently, my team and I worked with the Chairman to make the show's transition from one venue to another as smooth as possible," he says.

Taking place across the weekend of 8-9th July, the event settled into its new home as though it had been there for years! Footfall was counted at close to five thousand, with everyone in attendance acknowledging that the new venue has enough space to allow the show to grow.

A number of high profile traders, including Bilstein, Autobrite Direct and Roose Motorsport, exhibited their wares, while the traditional VBOA autojumble yielded bargains galore for owners of cars in need of rare parts. Other familiar activities included club parades, a fun fair and the highly anticipated Chairman's Cup contest.

"I'm very happy with how the show panned out," continues Steve. "It's

Viva la Market Harborough!

been great to see positive feedback shared across social media, although there's always room for improvement," he concedes. A revised layout is chief among his plans for 2018, but considering the mammoth task he faced in facilitating the VBOA show's switch from the home it has known for decades to an entirely new venue, we should all take time out to congratulate the LMF team, its security staff, the VBOA and its club reps for ensuring the survival of what is one of the best shows of the summer. Keep an eye on the VBOA website for the announcement of dates for next year's get-together: *www.vboa.org.uk*

OPEL FRUIT

Dave Stokes is the proud owner of one of the VBOA National Rally's standout Opels. "I've owned the car for nineteen years," he says, referring to his beautiful blue 1971 GT. Powered by a C20XE, the tidy two-seater is one of the more aggressive GTs we've come across; in addition to an Irmscher power cap and a custom exhaust system, the car sports a deep front airdam housing Porsche 914 fog lamps. BBS wheels, Yokohama tyres and an interior fully re-trimmed in cream and red leather join a custom dash loaded with digital gauges. As you can tell, Dave's Opel is accompanied by a seriously sorted spec sheet. "My car was the first GT in the UK to undergo a conversion to Red Top power," says the heating hose manufacturer from Derbyshire."Since that time, I've equipped three more GTs with C20XE engines," he adds. In fact, he's restored ten GTs to date, many of which joined his own car on the Opel GT UK Owners Club stand.

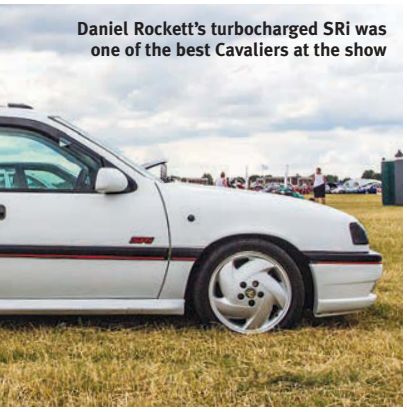
Each successive VBOA shows sees a higher number of newer Vauxhalls joining the party

Retropower was well represented by a selectioon of its recent builds

Nova Sports for the win!

POPULAR CHOICE

Steven (Steva to his mates) Armstrong's gorgeous green Calibra Turbo was one of the star attractions at the show. Fresh from its recent rebuild, the car amazed all who saw its spotless paintwork, Rotiform wheels, AP Racing brakes, immaculate engine bay, fully re-trimmed leather interior (including dash), genuine Vectra A 2000 digidash, airbrushed cam cover, vented wing and Irmscher bumpers. This car has been a real labour of love for Steva, and combines his love of Calibra Turbos with his affection for the German 'Cliff Motorsport Edition' launched in 1995. We'll be dedicating a full feature to this C20LET-powered peach in a forthcoming issue of *Performance Vauxhall*. It's good to know that our admiration for this cool coupe isn't misplaced; those who voted in the VBOA Chairman's Cup competition awarded Steva's Calibra first place. A thoroughly worthy winner. Nice one, Steva!



Daniel Rockett's turbocharged SRi was one of the best Cavaliers at the show

DOUBLE ACT

Not one, but two of the most outstanding modified vintage cars at the show belonged to auto electrician, Paul Ward. Parked alongside each other by the trade area, these heavily altered Vauxhalls left us flabbergasted at the lengths their owner had gone to in order to fit the engines, running gear and cabin furniture of modern motors.

First to grab our attention was Paul's 1961 PA Cresta, an already awesome-looking car that has been subjected to a two-door conversion and the installation of a donor Monaro's 5.7-litre LS1 V8, six-speed gearbox and diff. As if that wasn't impressive enough, the Monaro's complete interior has been grafted into the Cresta's cockpit. "It's much easier to keep hold of a donor car's dash, clocks and wiring than it is to try and fuse new and old technology together," says Paul in a very 'matter of fact' manner. Sitting inside the car without taking notice of its exterior, you'd be forgiven for thinking that you were about to set sail in a standard Monaro. "I needed to trim the dash due to the difference in width between the Cresta and donor car, but fitting the Monaro furniture was fairly straightforward," he says, as though this kind of conversion is commonplace. Which, if you're part of the Ward household, it is...

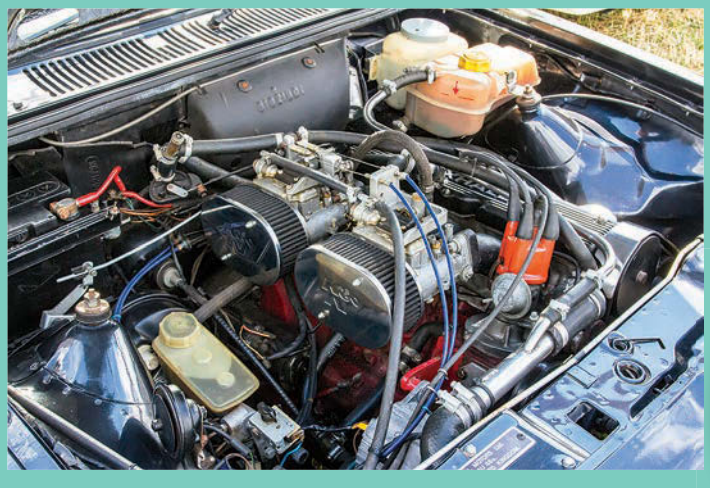
Paul's peculiar blue creation started life as a Victor FB. "It was my first car!" he beams. "I bought it in 1974. I love the look of old motors, but you can't beat modern performance. That's why I decided to fit the 4.2-litre V8, six-speed transmission and Quattro four-wheel drive from an Audi S4," he grins. Now producing six times the power it left the factory with in 1964, his fantastic FB can hold its own against almost anything it encounters on the road. As is the case with the Cresta, the leather-clad interior of the donor car has been carried over to the Vauxhall. Mr Ward, we salute you!

1980s styling at its finest

Quite possibly the newest Vauxhall at the show

GOLDEN GRAHAM

Graham Kerr's love of old-school GM metal can be traced back to the time he bought a 1.2-litre Chevette after leaving school. The rear-wheel drive car left a lasting impression, as evidenced by its owner's attack of various rally stages in Asconas, Mantas and Kadetts in the years that followed. His decision to hang up his competition driving gloves was accompanied by a desire to restore a genuine Chevette HSR. "This car came up for sale in 2000," he tells us, enthusiastically showing us around the black beauty. In poor cosmetic condition, the car required disassembly and restoration, which is exactly what it got, although Graham admits that he's ready to start all over again. "I like the idea of replacing the red body graphics with gold," he muses. "I'd like to paint the wheels gold too!" Before he gets busy with a spray gun and custom decals, he's going to refresh the car's engine with all new seals and gaskets. He's also considering the appointment of Weber 48s. Whatever route he chooses, his wide-arched 'Plastic Fantastic' is super-cool, and has the distinction of being one of only six black HSRs in existence.



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FAST FACTS

Mazda **MX-5 B6ZE(RS) engine**
Subaru Impreza WRX TD04 turbo
Chevrolet Chevette **differential**
Spax **adjustable dampers**
MG Trophy Blue paintwork

WORDS Jamie Arkle **PHOTOS** Dan Sherwood

BACK ONCE AGAIN WITH THE RENEGADE MAZDA

Richard Ireson's turbocharged Chevette is the latest classic Vauxhall to benefit from MX-5 power...

There's a lot to love about the Mazda MX-5, the machine that almost single-handedly revitalised the affordable sports car sector. After being launched in 1989, it became the best-selling two-seat convertible in history, shifting well over a million units worldwide. Now presented its fourth iteration and showing little sign of a dip in popularity, the car has become an icon of modern motoring. This is all well and good, but why have we started a feature in *Performance Vauxhall* by banging on about a four-wheeler from the Land of the Rising Sun? After all, aren't we supposed to be dedicated to cars that roll out of Luton and Rüsselsheim?

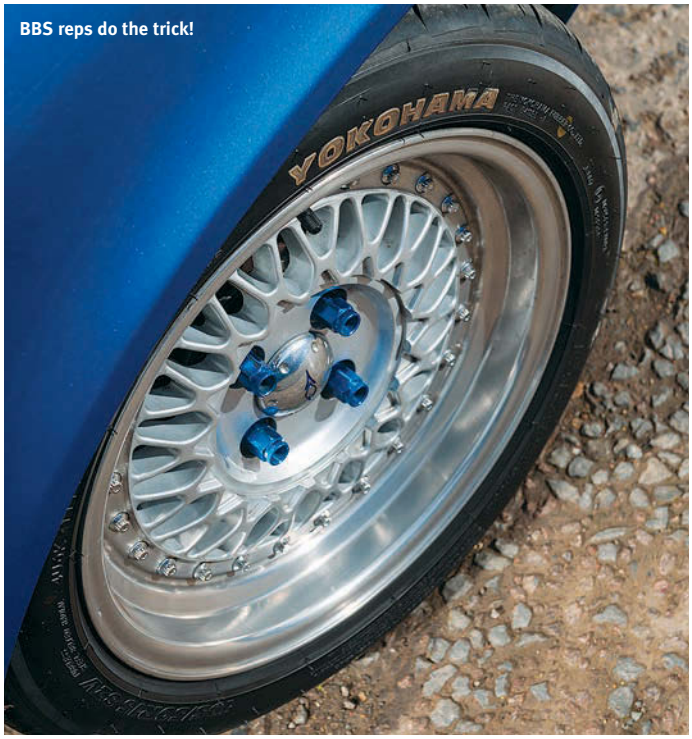
Well, dear reader, the answer lies in the fact that the MX-5 is something of an unsung hero when it comes to old-school, rear-wheel drive Vauxhalls. It's all down to the mighty Mazda's running gear; the traits that made the MX-5 so popular at its original point of sale make its guts suitable for vintage Vauxhalls today. We're talking mechanical simplicity, solid engineering, lightweight components, a longitudinally mounted engine and a matching gearbox. All of these qualities explain why the 1983 Chevette hatchback you see here was painstakingly assembled by talented fabricator, Richard Ireson.

Regular readers will no doubt be aware that Richard's ride isn't the first Mazda-powered Chevette to have graced our pages. We featured Dave Deakin's gorgeous Copperstone Starfire saloon back in 2014. Equipped with an MX-5 B6ZE(RS) engine, Dave's car proved that shoving Japanese nuts and bolts into retro Griffins brings new life to older Vauxhalls. Oliver Chatham's bright white Chevette, the cover star of last year's April/May issue of *Performance Vauxhall* (order your copy of the magazine at *bit.ly/vanimailvette*) is a similar story. Complete with its Honda S2000 FC20 two-litre lump, the VTEC-driven rally rocket wowed readers with its blend of performance parts from the Far East.

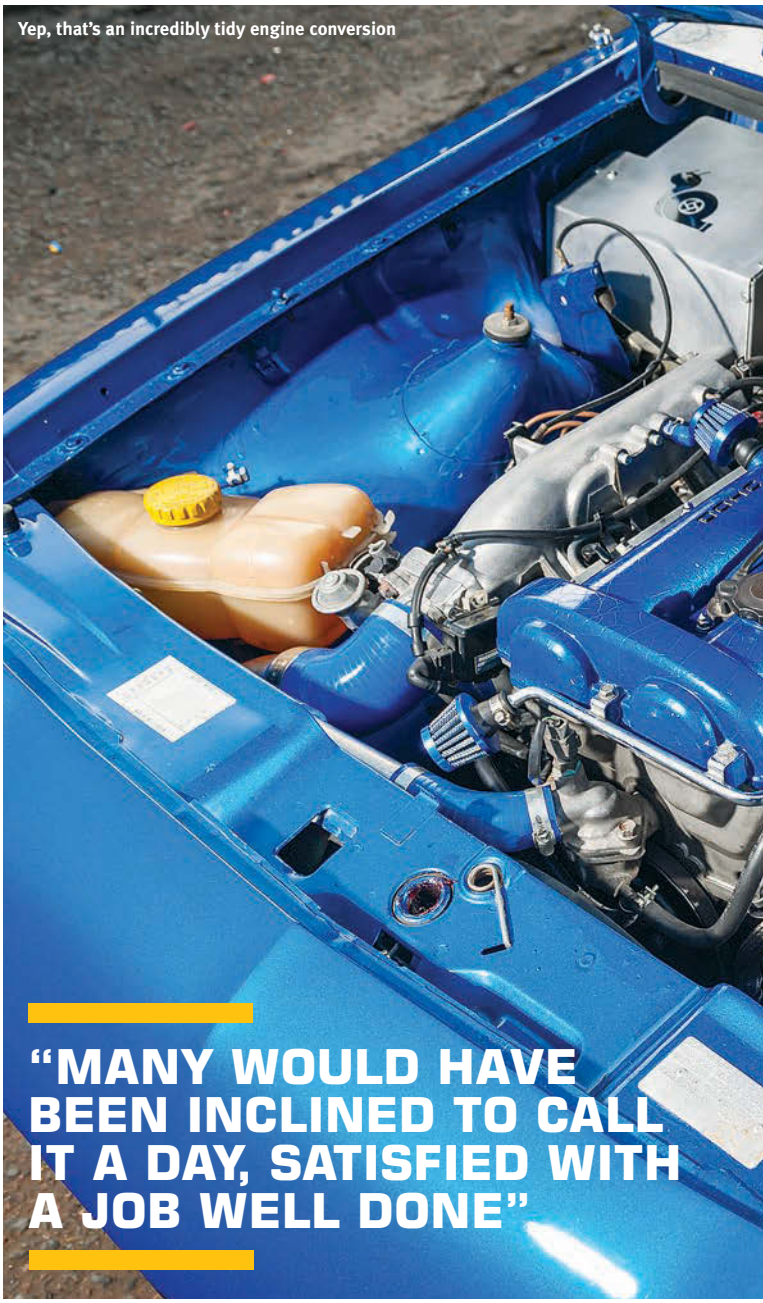
SCOOBY SNACKS

Richard's car makes use of the same 1.6-litre powerplant that Dave favoured. In the blue Chevette, however, it's joined by a donor Subaru Impreza WRX's TD04 turbocharger! "I bought the car eight years ago," says its proud owner. "A friend was selling it for a figure that was simply too good to ignore. Structurally speaking, the shell was solid, but the upper half of the car was riddled with surface rust due to the damp conditions of less than watertight storage." He wasted no time in setting to work righting the cars

A864 LPP



BBS reps do the trick!


Yep, that's an incredibly tidy engine conversion

"MANY WOULD HAVE BEEN INCLINED TO CALL IT A DAY, SATISFIED WITH A JOB WELL DONE"

many wrongs. A Ford Crossflow (first a 1.6, then a 2.0) was given the job of firing up the Vauxhall's rear wheels, while dodgy paintwork was replaced with a full respray in stunning MG Trophy Blue. Go on, admit it. You thought it was Arden!

While a Crossflow was certainly an upgrade over the Chevette's original 1256cc engine, the Blue Oval unit isn't exactly overburdened with performance potential. Recognising this fact, Richard began to weigh up the pros and cons of more modern equipment. "I briefly considered Toyota's 4AGE, the inline-four found beneath the bonnet of the AE86, but the apparent abundance of cheap MX-5s proved too difficult to dismiss. I ended up buying a complete first-generation example," he says.

His day job sees him working on a wide variety of weird and wonderful projects and production vehicles at Millbrook's test centre. It's safe to say Richard knows his way around a car! This helps to explain why fitting Mazda gear into the Chevette presented him with few problems. Moreover, his description of the task leaves you believing that melding an MX-5 and an old Vauxhall is no harder than making a cup of the brown stuff!

SIZE MATTERS

"When it came to having a decent amount of space to work with, the compact dimensions of the MX-5 engine were well suited to the front end of my Chevette," he smiles. "Put it this way, I didn't have to break out a hammer! It's a tight fit against the bulkhead, but I can see daylight behind the block, which means it fits, even if I had to reconfigure and reposition the car's brake servo."

Of course, getting the curiously named B6ZE(RS) into the nose of the Chevette was only half the battle; Richard still had to make the Mazda's five-speed gearbox sit within the Vauxhall's transmission tunnel. He also had to work out how to mate it to the Chevrolet Chevette (America's ridiculously successful version of the GM T-platform) differential that currently lurks at the back of his car. The first of these two requirements was achieved in the time-honoured fashion of attacking metal with an angle grinder, while the latter was sorted with the appointment of a custom single-piece propshaft.

Many would have been inclined to call it a day, satisfied with a job well done. Not Richard. Clearly never someone who rests on his laurels, he decided that forced induction was in order, leading to the application of a Scooby TD04. His rationale for fitting the part was simply that the B6ZE was fitted to the limited edition Mazda 323 4x4, a turbocharged homologation special. Reuniting the Chevette's new engine with turbocharging technology made perfect sense in the quest for higher horsepower.

"The engines fitted to the first and second-gen MX-5s are much tougher than people give them credit for. I didn't even have to lower compression ratio! I simply added the turbo and paired it with an MSD piggyback ignition controller. I've also installed a rising rate fuel pressure regulator. This setup has worked well so far, although the engine does drink a lot of petrol!" he chuckles, before admitting that he's not entirely sure what power the car is pumping out. Similarly configured MX-5s have been shown to produce 160bhp at 5psi. His Chevette is running at 7psi, allowing for a conservative estimate of 170bhp. After the soon-to-be-installed Mazda RX-8 fuel injectors, a Motorsport Electronics ME221 ECU and a custom map, however, the current under-bonnet hardware should be good for around 250bhp. That's a lot of power in a Vauxhall that weighs the square root of sod all (less than 900kg at last count!).

Nobody can say that a standard Chevette delivers admirably in the handling department. Truth

TECH SPEC

ENGINE
Mazda 1598cc B6ZE(RS) 16-valve DOHC, 78x83.6mm bore stroke, factory internals, colour-coded cam cover, open cone air filter, oil breather filters, Subaru Impreza WRX TD04 turbocharger with modified compressor housing and polished 63mm inlet and outlet pipework, standard WRX actuator, custom turbo flanges, front-mounted intercooler with custom boost pipework, MG ZR alloy radiator, standard MX-5 ECU, MSD piggyback ignition module, standard ignition leads, NGK spark plugs, standard fuel injectors, rising rate fuel pressure regulator, custom fuel feed and return pipes, custom downpipe and tubular exhaust manifold, custom twin-exit stainless steel exhaust system, ASH blue silicone hoses

POWER
Estimated 170bhp

TRANSMISSION
Rear-wheel drive, Mazda NA6A five-speed manual gearbox, MG F hydraulic clutch conversion, XTD Stage 3 clutch kit, lightened flywheel, custom single-piece propshaft, Chevrolet Chevette differential

SUSPENSION
Spax adjustable front dampers and lowering springs, Spax rear dampers with Insignia SRi springs Superflex polybushes throughout

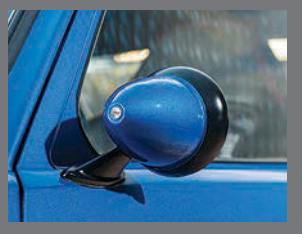
BRAKES
Mk3 Astra GSi front calipers with re-drilled Audio 80 discs, Chevrolet Chevette rear drums, Daihatsu Charade brake servo and master cylinder, Goodridge braided hoses

WHEELS & TYRES
7x15-inch (front) and 8x15-inch (rear) BBS replica rims, anodised lug nuts, Yokohama Parada Spec 2 195/50/15 tyres

BODY
1983 Chevette three-door hatchback, full respray in MG Trophy Blue, carbon-wrapped modified bumpers, 'bullet' style door mirrors, carbon-wrapped door handles, debadged, smoothed boot lid, pressed period registration plates

INTERIOR
Reclining leather bucket seats with red stitching, Securon four-point safety harnesses, rear bench delete, modified dashboard, Mazda MX-5 clocks, TIM boost gauge, Innovate Motorsports air/fuel ratio gauge, oil pressure gauge, carbon-fibre gauge panel, diamond plate floor mats, black ball gear knob, JBL front speakers, Vibe Slick rear speakers, Alpine head unit

THANKS
Paul and Ian Sully, Stefan Davies, John Ireson for the paintwork, and to my girlfriend, Amanda Turner, for putting up with the project!



"RICHARD'S HOT HATCH PROVES JUST HOW INNOVATIVE OUR CORNER OF THE MODIFIED MOTOR SCENE CAN BE"

Speed metal!

OWNER

RICHARD IRESON
AGE 33
JOB Fabricator
FIRST VAUXHALL
Single-litre Nova
FAVOURITE VAUXHALL
Lotus Carlton or VXR8
BEST THING ABOUT YOUR MAZDA-POWERED CHEVETTE
The colour
WORST THING ABOUT YOUR MAZDA-POWERED CHEVETTE
I don't get to use it every day!

Nbe told, other than HS-badged examples, the model was intended to be little more than a family runabout. Nevertheless, Richard has done his level best to improve the chassis of his car with Spax adjustable dampers and OEM Insignia SRi springs, although he admits that custom shocks from TGM Motorsport are on the cards, parts that will enable him to fine-tune ride height at the rear. He's also planning to fit a limited-slip differential in the not-too-distant future.

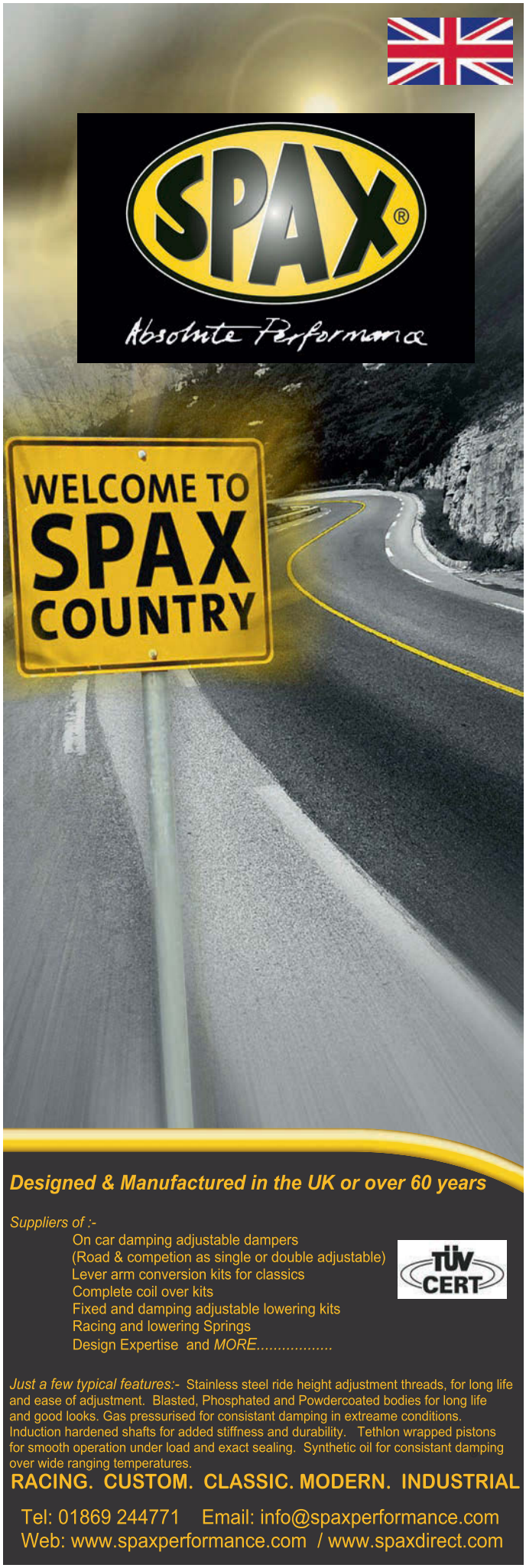
Braking is enhanced by equipment almost as leftfield as 'Sig springs; a Daihatsu Charade brake servo and master cylinder join Audi 80 front discs clenched by Mk3 Astra GSi calipers. At the back? Chevrolet Chevette drums. Each part is evidence of the open-mindedness needed when tackling a build of this nature, where very little is available to order 'off the peg'.

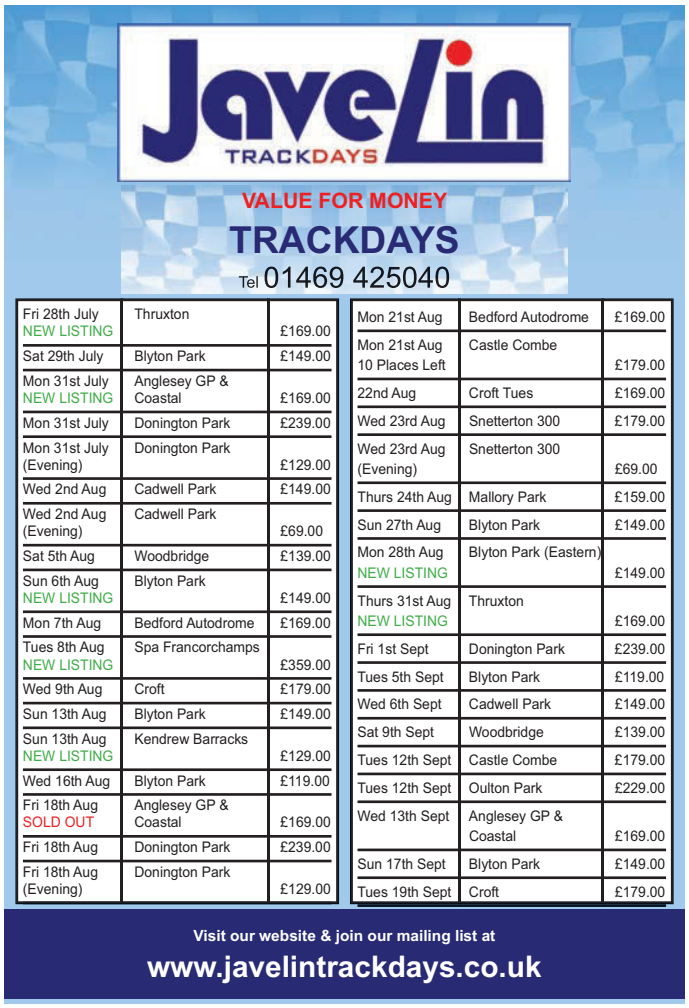
TIME SERVED

Despite this weird and wild selection of parts from a range of different car makers, Richard says that the conversion was fairly straightforward. A few weekends here and a few evenings there is all it took to get his modified 'Vette up and running. That said, two aspects of splicing together early '80s Vauxhall with early '90s Mazda provided unforeseen challenges. "Sorting the wiring was tedious and tiring. I spent the best part of two weeks sitting in my garden surrounded by a mess of wires while I sifted through them all, methodically labelling and organising them into a usable loom," he explains. "The other major ballache was fitting an MG F hydraulic clutch," he adds, citing his car's MG ZR radiator as another component lifted out of Longbridge. "The flip side to that stuff is how smoothly the turbo conversion came together, how reliable it has been, and how much space there is when working on a configuration such as this," he smiles. "It's been a rewarding project."

Inside the car, jet black recliners and safety harnesses live alongside a dash loaded with MX-5 clocks that fit the Chevette binnacle surprisingly well. Aftermarket gauges are housed in a custom carbon centre console panel, while an audio upgrade features Vibe Slick speakers and a recently acquired Pioneer DAB head unit that is about to replace a dated compact disc player.

Just like Dave's Starfire stunner and Oliver's white wonder, Richard's hot hatch proves just how innovative our corner of the modified motor scene can be. That the MX-5 drivetrain can be made to fit into a small Vauxhall is fantastic news for any of you interested in tinkering with a rear-wheel drive retro ride. No wonder the tiny Mazda's mechanicals are as popular now as they ever were!





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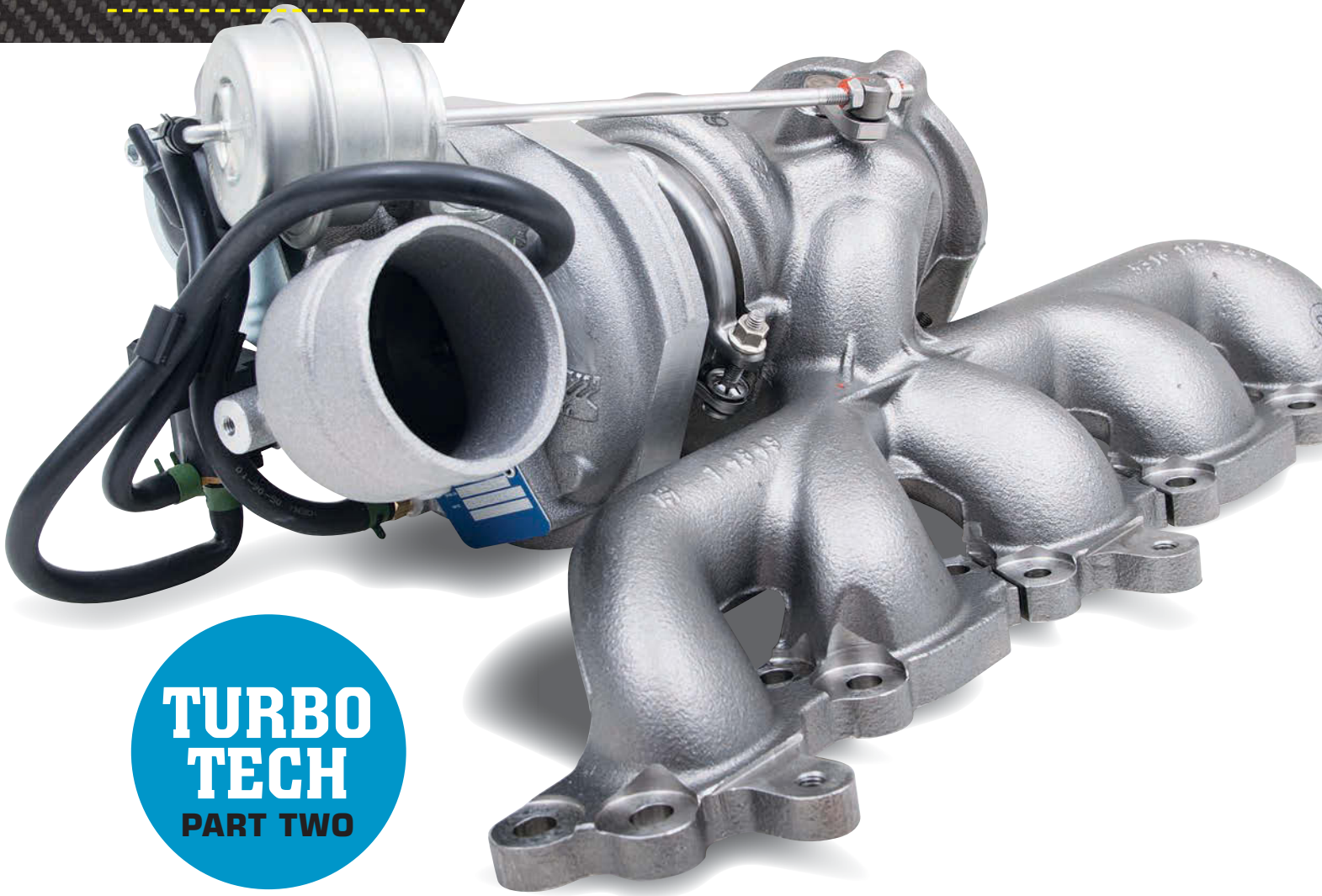


TURBO TECH PART TWO

FULLY CHARGED

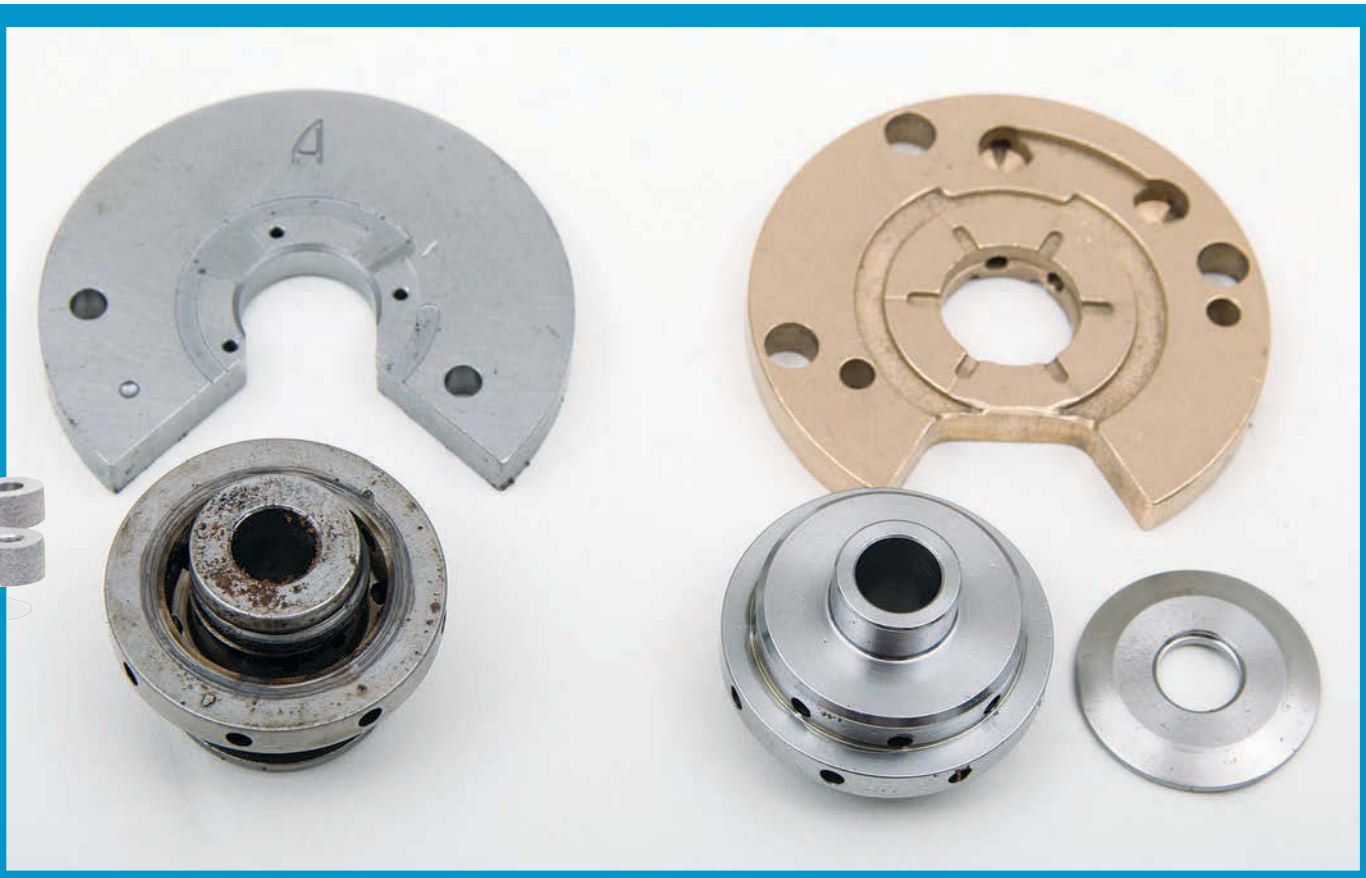
In the second part of our guide to turbo technology, we look at bearings, compressor wheels and lag...

CENTRE BEARING HOUSING

In the middle of your car's turbocharger lives its centre bearing housing. As its name suggests, its job is to play host to the turbo's bearings and the oil supply that allows the whole assembly to spin freely. All the inner workings of the turbo are found within the centre bearing housing (including the journal bearings and thrust bearings of conventional turbochargers, or the ball-bearing cartridge of a more modern turbocharger).

There are two main styles of centre bearing housing, one which is oil-cooled and one which is water-cooled. Oil-cooled turbos rely on the engine's ability to keep its oil temperature under control. In some cases, this can result in an unwanted increase in oil temperature. In such circumstances, a water-cooled turbo is a safer option – the engine's cooling system is plumbed directly into the turbo in order to keep temperatures low.

It's not uncommon to see race or rally cars using water-cooled turbos that aren't plumbed into the host vehicle's water system. Instead, exhaust gas temperatures are monitored and used to gauge how much heat the turbo is generating during short, sharp bursts of use in a motorsport environment.



JOURNAL AND THRUST BEARINGS

Older turbochargers use a journal bearing setup. The journal bearings themselves are phosphor bronze parts that support the turbine shaft within the bearing housing. This is a 'fully floating' setup, meaning that there's a thin layer of oil between the shaft and the bearing, and also between the bearing and the bearing housing. The incredibly small oil channels in journal bearings are often the primary victim of turbocharger oil contamination; it doesn't take much to block the oil channels, and as you can imagine, the shaft and bearings won't last long when rotating at over 100,000rpm without a supply of adequate lubrication!

A traditional journal bearing setup requires the use of a thrust bearing to take up any end float. When a turbo is spinning at full chat, its compressor wheel is cutting through so much air that it literally tries to pull the whole shaft out of the front of the turbo! The thrust bearing's job is to prevent this from happening.

The combined assembly of these parts is surprisingly simple: a thrust collar slides over the shaft, but due to a step in the diameter of the shaft, the collar cannot slide beyond a specific point. Here, a 270° bearing (so-called because it has a 90° cutout) can slide over the collar, taking up any end float and preventing the shaft assembly from moving backwards or forwards. This is what you may have heard referred to as 'play' in the shaft of a turbo.

Most standard production turbochargers come with a 270° thrust bearing. It's cheap, easy to manufacture and perfectly adequate for most fast-road applications, however, when we start to increase boost pressure and ask for more power, the limitations of the part demands the appointment of a 360° thrust bearing. As its name suggests, this type of bearing supports the shaft through a full 360°. Because this bearing lacks the cutout of the 270° thrust bearing, a special two-piece thrust collar is required (one piece fitting either side of the 360° bearing). This adds cost and complexity to production, but will offer increased potential for extra boost. As an example, the forced induction specialists at Turbo Performance say that a Garrett T3 will safely produce around 10psi of boost with a standard 270° thrust bearing in place, yet the same turbo will kick out as much as 30psi with a 360° bearing fitted. Crikey!

BALL-BEARING TURBOS

Modern turbos, including Garrett's GT series and the BorgWarner EFR range, use ball-bearings instead of traditional journal bearings. The use of this newer technology aids spool-up by offering less frictional losses. The ball-bearings are encased in a cartridge and do exactly the same job as journal bearings (e.g. supporting the turbine shaft), but because there is no end float to account for, the cartridge doesn't need a thrust bearing. It is possible to convert an older style turbocharger to utilise a ball-bearing core by machining its bearing housing to accept a ball-bearing cartridge, but this approach isn't as popular as it once was due to the relatively low price ball-bearing turbochargers can be bought for off-the-shelf today. Furthermore, modern ball-bearing turbos benefit from later turbine and compressor wheel designs that encourage greater performance.

COMPRESSOR HOUSING

At the front of your Vauxhall's turbocharger sits its compressor housing. This is the snail-shaped casing that houses the compressor wheel. Different size compressor housings are available for most standalone turbochargers, but where the same area/radius (A/R) exists across an entire range of turbos, companies like Turbo Performance can machine the housing in order to adjust A/R, or to enabe it to accept a much larger compressor wheel. In some cases, it is possible to produce a bespoke compressor housing with a specific A/R. For more information on A/R, read the first part of our guide to turbocharger technology (as printed in the Summer 2017 edition of *Performance Vauxhall*). Order your copy at *www.bit.ly/pvshowstoppers*.

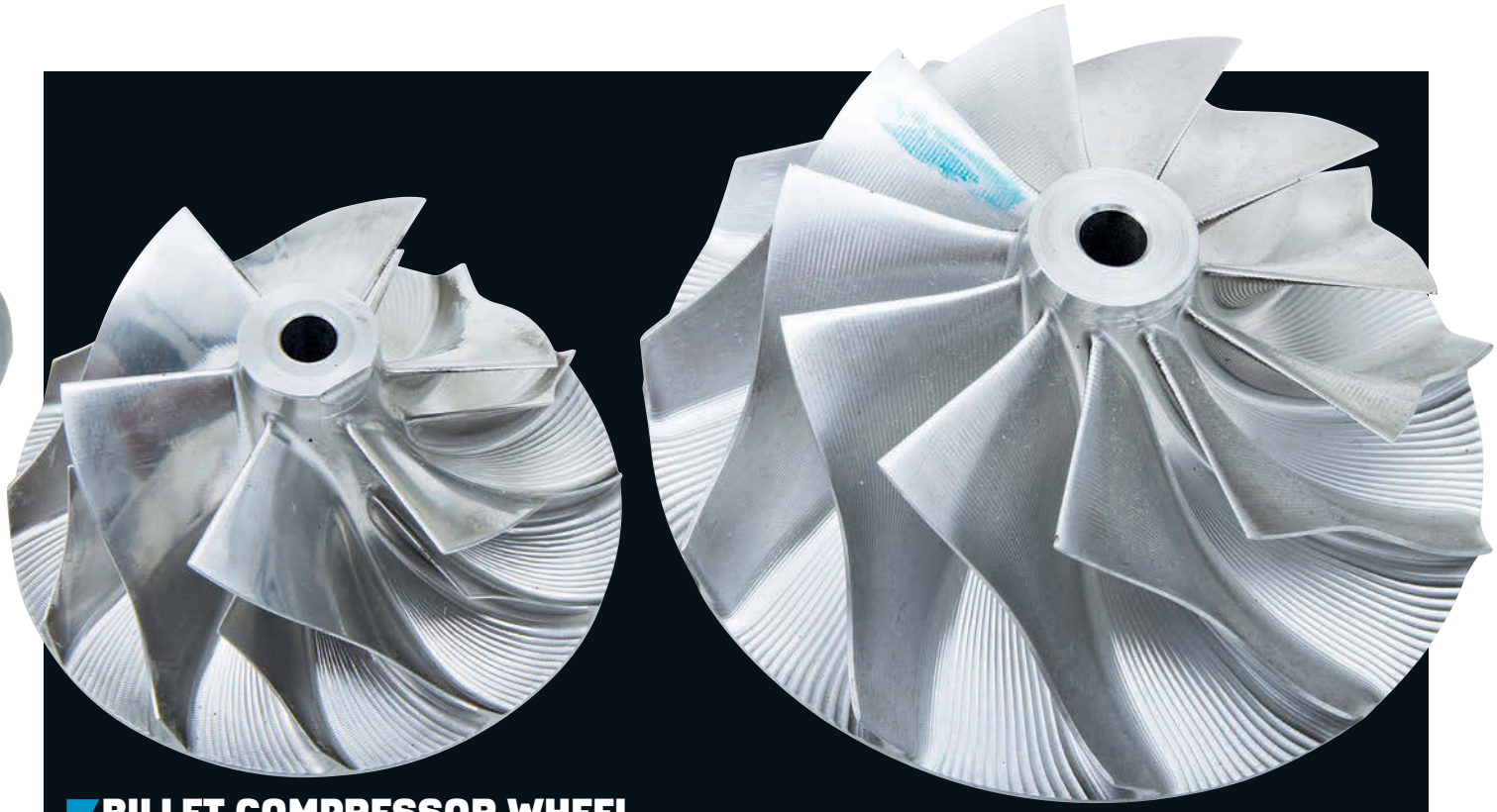
COMPRESSOR WHEEL

Now we're at the business end of your turbocharger! As we just mentioned, inside the unit's compressor housing is its compressor wheel. This is the part of the turbo that forces air into the engine in a bid to deliver more power.

Most aftermarket turbos can be ordered with a choice of compressor wheel, although some brave individuals have been known to manufacture their own from billet aluminium. Looking at a compressor wheel from directly above, you will notice that it's conical in shape. In other words, the diameter at the front (top as you look down) is smaller than the diameter of its base. The difference between these two diameters is referred to as 'trim', and altering the measurements has a big impact on a turbo's behaviour.

Although not as pronounced as is the case with the turbine wheel, a compressor wheel with a smaller trim will spool faster, whereas a larger trim wheel will have a higher potential for increased power.

Most production turbochargers come with cast aluminium compressor wheels. These parts are usually restricted by the blade design and trim set at the point of manufacture. What if we want to tweak and tune? It's a good job you asked! This is where billet compressor wheels arrive at the party...



BILLET COMPRESSOR WHEEL

Unlike most standard turbochargers, many high-output aftermarket bhp boosters make use of a compressor wheel machined from a single piece of billet aluminium. Contrary to popular belief, the material itself offers no real performance advantage over cast aluminium. Put it this way, if you had two compressor wheels identical in their design, but one was cast and one was made from billet, there would be no noticeable difference in performance between the two. That said, using billet aluminium offers huge advantages when it comes to altering the design of a compressor wheel, which in turn, has a big impact on turbo performance.

Billet allows specialists to easily (and affordably) customise trim and blade design to suit the intended application. It's also possible to reduce the hub area (the bit where the bolt sits to hold the compressor wheel onto the turbo) due to the machining process allowing for more complicated shapes than a casting process. By reducing the size of the hub, we are effectively increasing the size of the blades, but without increasing the overall diameter of the compressor wheel. This has the same effect as fitting a larger compressor wheel, but we haven't had to endure the ballache of changing the compressor housing to accommodate the update! At the same time, we've reduced the overall weight of the compressor wheel. Less weight equals less inertia, which equals faster spool times.

That's not the only trick a billet compressor wheel has up its sleeve. The chaps at Turbo Performance explain it in the following terms: "A billet compressor wheel can make use of 'extended tips'. Looking down from the base of such a wheel, you can see that its extended blade tips actually protrude beyond the base diameter of the wheel itself. In fact, they extend into the void inside the compressor housing. The advantage of this modification is that you get all the benefits of having larger blades, but without increasing the wheel's overall diameter. In real world terms, this means the turbo is capable of producing significantly more power without suffering from increased lag." What's not to love about that?!

HEAT MANAGEMENT

In the same way that heat wrap can offer performance benefits on exhaust systems, so too does appropriate heat management on a turbocharger. The easiest and most efficient way to achieve reduced heat is to fit a turbo blanket, such as the carbon-fabric and calcium magnesium silicate wool offering from Forge Motorsport (check it out at *www.bit.ly/turboblanket*).

A turbo blanket will keep soaring operating temperatures at bay, encouraging heat to remain in the exhaust housing. The advantages of this are twofold. Firstly, exhaust gas temperatures are kept high, which means that they move faster and with more energy – ideal for spooling-up the turbo. Secondly, and probably of greater importance to owners of fast-road cars, under-bonnet temperatures are kept in check. There are numerous benefits here, including lower intake temperatures, plus the reduced risk of bonnet paint blisters and badly burned bodywork.

BOOST THRESHOLD VERSUS LAG

Boost threshold and turbo lag are two very different things, even though they're often confused with one another. Let's have a go at clarifying matters!

A turbocharger's boost threshold is the rpm range where the engine is producing enough exhaust gas for the turbo to generate positive boost pressure. This can be affected by a number of factors, but it's widely accepted that the larger the turbo, the higher the boost threshold. The turbo might not start producing any meaningful amounts of boost pressure until higher up the rev range, but that doesn't mean the turbo is 'laggy', it just means it has a higher boost threshold!

Turbo lag is the time it takes for a turbocharger to produce boost after you hit the throttle. On many modern OEM applications, this is almost instantaneous. On many old or aftermarket setups, however, there may be a delay between you putting the pedal to the metal and the turbo producing positive boost pressure.

We can make use of tricks such as ball-bearing cores, twin-scroll manifolds and rally-inspired anti-lag systems (covered in the first part of our turbo tech guide) to help reduce or eliminate turbocharger lag, but other than changing the physical size of the turbocharger itself, there is very little we can do to retrospectively alter boost threshold.

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WORDS Si McNally **PHOTOS** Mick O'Rourke

REST ASSURED

The Power Maxed Racing team head into the BTCC's mid-season break with an opportunity to take stock of the Astra K's first season of racing...

If you're a BTCC fan, you'll no doubt be aware of the drama that unfolded at Croft just a few short weeks ago. With Saturday 10th June bringing something approaching a monsoon to the fair hills of North Yorkshire, qualifying could be comfortably described as 'moist'. Unfortunately, said conditions – mixed with a freak incident that caused a good few litres of oil to be dumped on the approach to Barcroft (the fastest part of the circuit) – led to one of the worst crashes in the history of the championship. No fewer than twelve cars were involved, with serious injuries inflicted upon numerous drivers. Luckily, all survived and are on the road to recovery. Equally as fortunate, the Power Maxed Racing (PMR) Vauxhall Astras managed to avoid the carnage.

Understandably, the session was 'red flagged' in order to enable to marshals to do their thing (which they did impeccably). Unfortunately for us, the session wasn't restarted, which meant that our star drivers, Tom Chilton and Senna Proctor, were left in the positions they found themselves in when the red flags started flying. The Astras weren't able to improve upon the lap times they'd already registered, but with Tom in tenth place and Senna only just getting warmed up in fifteenth, we weren't too far behind the frontrunners. On with the show!

MIXED START

Race day delivered sunny weather, but a very sombre atmosphere. With news filtering through that three of our fellow track-dwellers (Jeff Smith, Luke Davenport and Aaron Smith), were in a critical condition, the thoughts of everyone in the paddock, not to mention the 40,000 assembled fans, were understandably elsewhere.

The first race of the day saw the Astras get off to a blistering start, with Senna making up places into the first corner. From that point onwards, the atmosphere in the PMR garage was electric. In the number eighteen car, he crossed the line in fourteenth, with Tom pulling a fantastic ninth place finish. Needless to say, we were feeling good about the rest of the day's racing.

In the couple of hours that pass between each race, our engineers are flat-out giving the Astras a thorough examination and changing components where necessary. Brake discs, pads and tyres are all replaced between races. After all, when the field is separated by less than 1.5 seconds, we need to ensure our cars are performing at the best of their abilities. This determination to succeed involves interrogation of each car's data recorders, lap sector times and feedback from the drivers – the tiniest of mistakes or overlooked input can cost us dearly on the track.

This being BTCC, we also have to repair any damage done during the race (which is something of a regular

occurrence!). What you might not know, however, is that we have a truck that accompanies us to each meet. This load-lugger carries our spares (wheels, tyres, panels, mechanical equipment, anything we might need to rebuild the car in the event of an accident). This support vehicle came in very handy during the second race of the day...

STOPPING POWER

With many components being listed as 'control parts' (all competing cars have to make use of the same suspension arms, subframes etc.), mechanical failures are rare. Unfortunately, Lady Luck wasn't on our side when we returned to race action; we watched as Tom ground to a halt very early on. From what he told us over our pit-to-car radio, the fault sounded like a transmission issue, a diagnosis that led us to retire the impotent Astra from the race. Meanwhile, Senna was up to eleventh place. We were feeling hopeful as the race progressed, although final lap battles saw the young driver pushed wide, leaving him to finish in thirteenth. Nonetheless, he took home the Jack Sears Trophy. Again!

The team wasted no time in getting Tom's Astra up in the air in a bid to work out what had caused its sudden failure. An inspection highlighted an incredibly rare fault in the form of a busted driveshaft. A few minutes work had the part replaced. Bring on the third race of the day!

Tom started at the back of the grid in thirty-second place due to his earlier retirement. This was the last BTCC race before the summer break, meaning that both drivers were determined to score as many points as possible. By the fourth lap, he was in twenty-second place, with Senna chasing down Adam Morgan for twelfth. In the end, the Astras finished in a very respectable twentieth and fourteenth position.

Interesting aero update, Senna

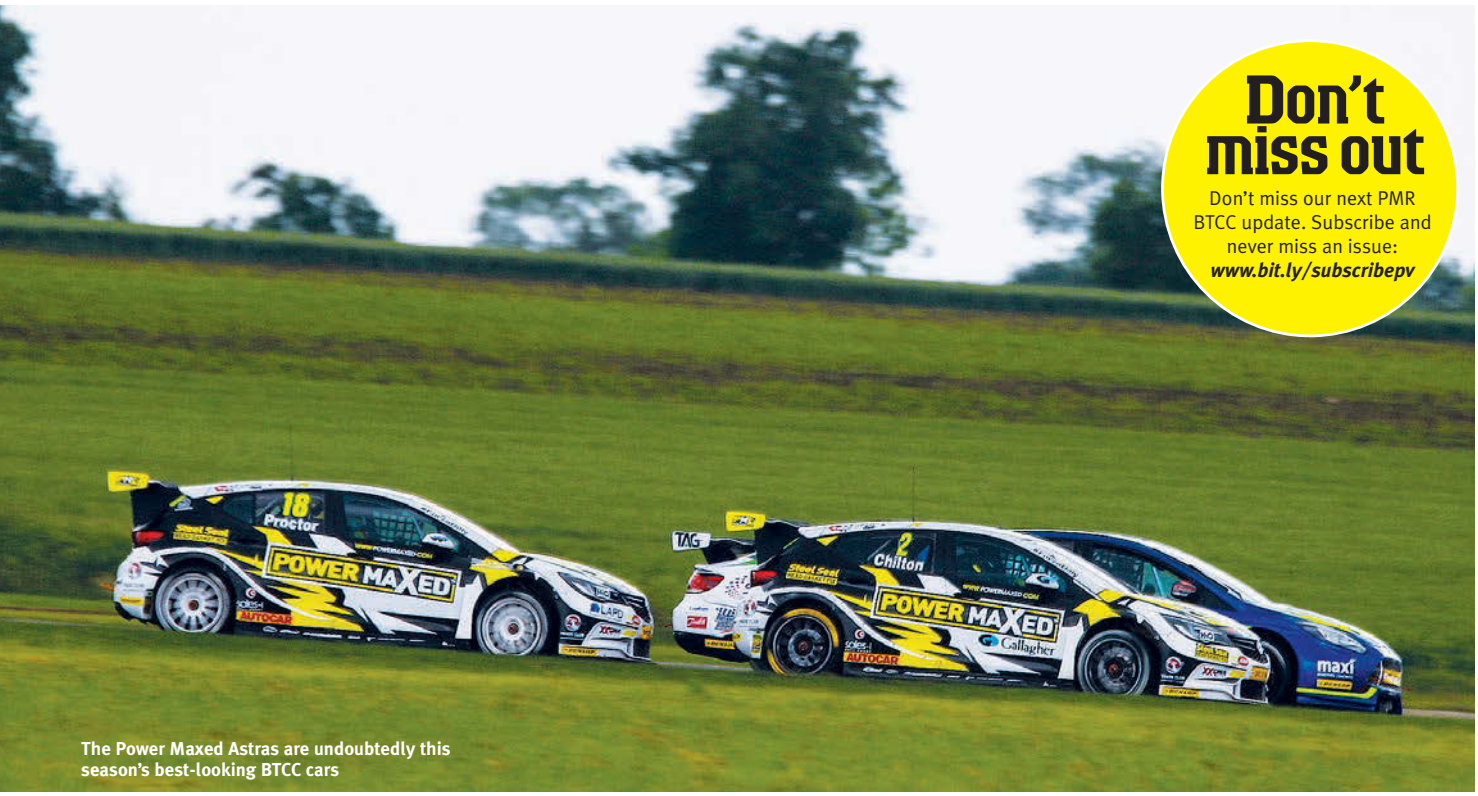
BACK TO BASE

With the race over, it was time for us to head back to the PMR workshop for a well-earned six-week 'break'. Note the inverted commas. Describing this period of absence from the track as anything other than manic is selling it short! This pause is our chance to strip the cars down to their bare shells before developing and changing parts that we haven't had opportunity to attend to during the first half of the season. The work our engineers and drivers put into ensuring the Astras are competitive is evident in their performances; with Senna consistently in or around the top ten, we're really happy with the way the Vauxhalls are behaving so far. Having said that, with thousandths of a second separating the guys on the podium from the rest of the pack, and with the top teams having reams of data for the cars they've been in charge of for multiple seasons, we're always working to find ways of improving beyond expectation.

For example, with our very own damper testing rig, we've been busy fine-tuning shock absorber and spring rates, plus we've made adjustments to each car's induction system to encourage the intake of more cold air.

If you visited the recent Goodwood Festival of Speed, you may have seen Senna's number eighteen Astra on display. We were invited to the world-famous motorsport event by the guys from vinyl manufacturer, 3M. Recently wrapped by our friends at Joyce Design, the car generated a lot of positive feedback.

It's good to know that so many of you appreciate the blood, sweat and tears that have gone into making these Astras such capable racing machines. Talking of which, at the time of writing, they're out testing in advance of the next BTCC meet at Snetterton Circuit, which takes place the weekend of 29-30th July. See you there!



The Power Maxed Astras are undoubtedly this season's best-looking BTCC cars

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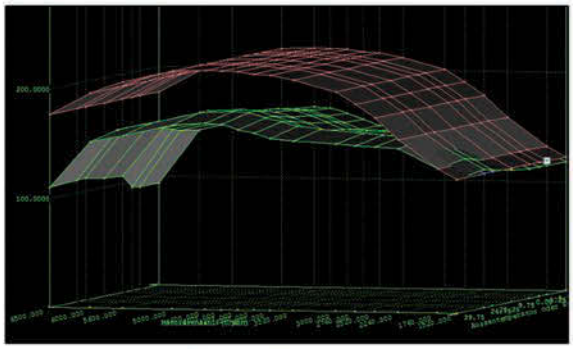
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WORDS Marc Wale and Dan Furr **PHOTOS** Matt Woods

ESTATE OF MIND

Ever wondered what a factory Mk5 Astra VXR estate might have looked like? Our guess is it wouldn't be far off this **325bhp** Z20LEH-powered Moonland Grey SRi presented by MW Performance...

FAST FACTS

325bhp Stage 3.5 Z20LEH engine
K06 **hybrid turbocharger**
Helix **limited-slip** differential
Bilstein B12 suspension kit
VXR Nürburgring Edition **seats**

It's a sad fact of life, but there are Vauxhall fans out there (many of whom will be reading this article) who would love to buy themselves an Astra VXR, but can't do so due to the need to have enough space at the rear end of their car to accommodate kids and a large amount of luggage. For many of these guys and girls, the notion of hopping into a tuned hot hatch is little more than the stuff of fantasy. If only factory bosses had designed and built a high-powered Mk5 Astra VXR estate. Bah!

Not one to daydream, Marc Wale, head of Cheshire-based VXR service and sales specialist, MW Performance (MWP), decided to

MWP VXR TOURER

explore the idea by building a VXR-powered 'more door'. Looking at the finished car, it's difficult to imagine it as the two-litre SRi it started out as before Marc's talented team of GM pimpers transformed it into the cool cargo carrier it is today. Nonetheless, a standard sports tourer is exactly what it was, complete with a Z20LEL engine pumping out smoke.

"I bought the car through the motor trade a few years ago," explains Marc. "It was dishevelled, a look emphasised by missing side skirts. Luckily, the Moonland Grey paintwork was in pretty good nick, and came up a treat after a comprehensive detail and paintless dent removal," he says.

Replacing the skirts, adding a freshly colour-coded VXR front bumper and installing a matching grille transformed the car's appearance. Additional cosmetic updates included a colour-coded boot strip and debadged rear end, followed a short while later by a set of diamond-cut Ronal nineteen-inch Astra VXR wheels wrapped in quality Yokohama rubber. So far, so good.

NEW LIFE

The SRi that Marc's team were upgrading holds status as a rare car due to its two-litre lump (most SRis are packing diesel or 1.8-litre petrol units) and main dealer cost options, including a factory-fitted XP body kit, window tints and a panoramic sunroof.After the VXR dress-up parts were added, the car looked every bit the performance estate, yet its tired old LEL was struggling no matter how much care and attention it was subjected to.

"We got it running without fault before trialling a few tuning configurations at our workshop in Saltney," explains Marc. "We added a full Garrett GT28 turbo setup, larger fuel injectors and many hours of dyno time." It wasn't an easy task, but a reprieve came when he was given the opportunity to take advantage of a low mileage Z20LEH engine that was surplus to requirements on a track car build MWP were involved with. Without much in the way of hesitation, the Astra's original two-litre was removed and replaced with the VXR powerplant. In the interests of carrying out a 'proper' VXR conversion, a full VXR engine wiring loom, ECU, body control module, ABS pump, dash clocks and various other components were fitted before the car was reprogrammed to believe that it's a genuine VXR. Is this the automotive equivalent of brainwashing? Answers on a postcard!

With the potential for a serious increase in performance now available, the MWP team engaged in the development of a Stage 3.5 power upgrade. A K06 hybrid turbo with a billet compressor wheel was fitted alongside Piper camshafts, double valve springs, a custom three-inch turbo-back exhaust system

"A K06 HYBRID TURBO WAS FITTED ALONGSIDE PIPER CAMSHAFTS AND AN AIRTEC INTERCOOLER"

Not a typical Mk5 Astra estate powerplant!

VXR Ronals recently made way for Team Dynamics rims

OWNER

ANDREW HALFORD

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Lotus Carlton
BEST THING ABOUT YOUR ASTRA ESTATE
The way it looks
LEAST FAVOURITE THING ABOUT YOUR ASTRA ESTATE
Having to get rid of it!

'Burg Edition interior is a neat touch

(retaining the OEM oval tailpipe), a Stage 2 Airtec Stealth intercooler, a CDTi airbox with an enlarged intake, silicone hoses and custom ECU software that works to produce a proven 325bhp alongside 331.4lb/ft torque. Not bad for a car that left the factory with half that power!

FIRM FOCUS

Obviously, the Z20LEH is capable of big bhp, but Marc hasn't lost sight of what this particular Astra was originally intended for. "It now offers respectable performance coupled with great driveability and good road manners!" he smiles. Those qualities are made possible by the installation of the donor VXR's M32 six-speed gearbox, an organic clutch, a Helix limited-slip differential and a lightweight billet flywheel. No dual mass dampening here, thank you very much!

Further chassis upgrades were applied in the form of Bilstein's B12 suspension kit (a package comprising B8 dampers and Eibach Pro-Kit lowering springs). "We trialled various products, but the matching of Billies with Eibach springs is hard to beat," reasons Marc. He's also added a Whiteline rear anti-roll bar and a full complement of Powerflex polybushes to the mix, along with VXR brakes, EBC grooved discs and performance pads. This is one seriously sorted Astra!

No matter how good it looked, performed or handled, the car was still making use of an interior that screamed 'standard SRi'. Fortunately, Hills Salvage in Skelmersdale had a Mk5 Astra VXR Nürburgring

"THE CAR OFFERS RESPECTABLE PERFORMANCE COUPLED WITH GOOD ROAD MANNERS!"

TECH SPEC

ENGINE
1998cc Z20LEH 16-valve DOHC, Piper camshafts, Piper double valve springs, CDTi airbox with enlarged intake, K&N air filter, K06 hybrid turbocharger with billet compressor wheel, Stage 2 Airtec Stealth intercooler, bespoke turbo-back three-inch stainless steel exhaust system with OEM oval tailpipe, NGK Iridium spark plugs, MW Performance Stage 3.5 map on VXR ECU, VXR wiring loom, VXR body control module, ASH and MTC Motorsport blue silicone hoses

POWER
325bhp, 331.4lb/ft torque

TRANSMISSION
Front-wheel drive, M32 six-speed manual gearbox, Helix organic clutch and lightweight billet flywheel, Helix limited-slip differential

SUSPENSION
Bilstein B12 suspension kit (comprising Bilstein B8 shock absorbers and Eibach Pro-Kit lowering springs), Whiteline rear anti-roll bar, Powerflex polybushes throughout

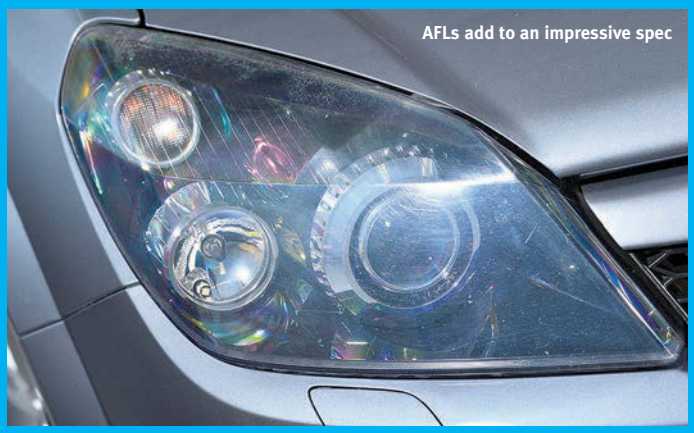
BRAKES
VXR calipers, EBC drilled and grooved discs, EBC pads, HEL braided hoses, ATE Super Racing DOT 4 brake fluid, VXR ABS pump

WHEELS & TYRES
19-inch diamond-cut Ronal VXR alloys, Yokohama S-drive 235/35/19 tyres, Richbrook valve caps

BODY
2005 Mk5 Astra SRi estate, Moonland Grey paintwork, factory-fitted XP exterior pack, VXR front bumper, VXR grille, Maxton front splitter, panoramic sunroof, Adaptive Forward Lighting (AFL), factory tinted windows, GM mud flaps, colour-coded boot strip, Arden Blue VXR badge, MW Performance window graphics, personalised registration plate

INTERIOR
VXR Nürburgring Edition heated leather seats, custom rear bench brackets, VXR steering wheel, VXR six-speed gear stick, VXR dash clocks, retrofit climate control and CD30 MP3 head unit, full-colour information display with VXR logo, Piano Black centre console, carbon dashboard trim, carbon door card trim, VXR pedals

THANKS
Marc and the team at MWP for building such a brilliant car



AFLs add to an impressive spec

This very car is ready and waiting for you to take it home!

Edition in for breaking. The car's specially-embossed leather sports seats, Piano Black dash inserts, full-colour information display (complete with VXR logo), climate control panel, gear lever surround, steering wheel and gearstick were promptly bought and installed inside the Moonland machine. A rear bench designed for a three-door isn't an easy fit inside an estate, however, meaning that Marc's team had to source bracketry from a hatchback before manipulating the parts in order to secure the bench in place.

FAMILY TIES

Meanwhile, Lougborough mechanic and lifelong Vauxhall fanatic, Andy Halford, was considering the purchase of a Mk5 Astra VXR. "I have four kids, so there's no way a standard VXR would be suitable as my only car," he tells us. "I figured the only way I could justify buying a VXR was to treat it as a toy while keeping a sensible second car for family duties," he adds, before reeling off a list of the Griffins he's previously altered (a collection that includes various Novas, a Mk3 Cavalier GSi2000 and a V6-powered Corsa B).

Scanning the classifieds on eBay one Saturday afternoon in April, he stumbled upon the MWP online store. There, among the list of available VXR8s, Monaros and Vectra VXRs was the modified Astra estate. "I knew that a three-door VXR wouldn't suit my family life, but the car Marc's team put together meant I could enjoy all the benefits of a tuned performance Vauxhall whilst still being able to take my kids out for days away," he beams.

"I love the way the car looks. It's a real sleeper, and is exactly what I imagine a Mk5 Astra VXR estate would have been like if the boys at Vauxhall had decided to produce the model themselves," he adds, before telling us that he wasted no time in heading over to meet Marc and agreeing to buy the car. Happy days!

A subsequent invite to display the Moonland marvel on the *Performance Vauxhall* stand at PVS provided a good enough reason for Andy to shell out for a set of gloss black Team Dynamics Pro Race 1.2 wheels and an Alcon six-pot front brake kit (including 365mm EBC discs and pads) in advance of the trip to Santa Pod. "I was planning to fully forge the engine with the intention of chasing power above the 400bhp mark, but my involvement in a new business venture means that I need to buy a van," sighs the 35-year-old spanner man. "I'll probably buy a Vivaro, and it'll probably end up with new wheels, bull bars, a big bumper kit and engine mods, but the bottom line is that I've had to sell the Astra to enable my necessary spend." Yikes!

HOMEWARD BOUND

And where has the car ended up? Back at MWP where it's ready and waiting for its new owner! "I really didn't want to part with the car," admits Andy. "The look on people's faces when the it shows 'em a clean pair of heels is so satisfying, and not something I'd ever get bored of experiencing. It's also great to be able to say that the car's bodywork is immaculate. It really is a fantastic example of a super sleeper!"

Marc and his team have proved that for every model you wish Vauxhall had made (but didn't), there's a chance the base car and a selection of suitable parts are available to turn your dream into a reality. V8 into an Omega? Go for it. Z28NET into a Corsa C? Why not, eh?! Just be sure to let us know what cool creation you come up with. Then again, you could save yourself the hassle by popping along to MWP before driving home in your very own Mk5 Astra VXR estate!

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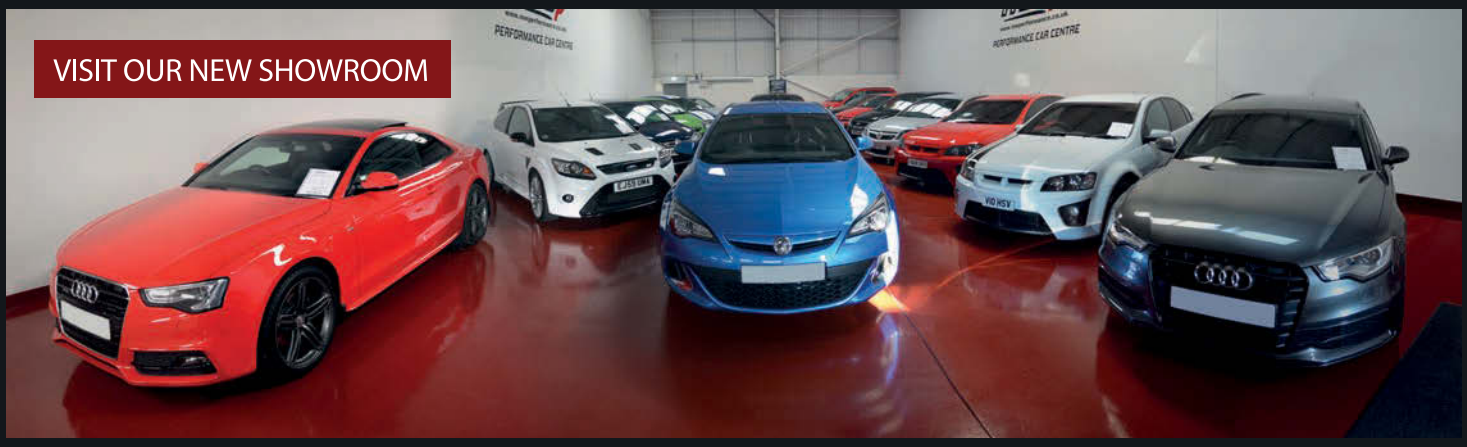

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BUY & MODIFY

CAVALIER TURBO 4X4

We take a look at the greatest Mk3 Cavalier of them all as it celebrates its twenty-fifth birthday...,

WORDS Dan Furr and Dave Reid **PHOTOS** Everyone else

In standard guise, a Cavalier Turbo 4x4 is capable of a 0-60mph of little more than six seconds with a top speed of more than 150mph thanks to 204bhp managed by a turbocharged two-litre engine and a six-speed transmission mated to four-wheel drive. The long sixth offers effortless cruising, and though official figures suggest 32mpg is to be expected, many owners (including myself) have reported many more miles to the gallon when cruising on the nation's motorways.

When you take a look at what were some of the very best seats available in a production saloon at the Cavalier Turbo's original point of sale, not to mention superior trim level and a chassis boasting independent rear suspension, it's easy to understand why so many fleet managers bought Vauxhall's fabulous 'fourby'. No other four-door offered the same level of performance and equipment for the money (£19,137).

The car did, however, have what has gone on to become recognised as its Achilles' heel – a complex ECU-controlled hydraulic four-wheel drive transfer box arrangement. Designed to vary torque to the rear wheels and disengage under braking, the system is very clever, but it requires correct driving conditions to be observed, none of which were highlighted by Vauxhall (it would have been a marketing disaster), leading to many transfer boxes suffering premature failure.

A total of 2244 Cavalier Turbo 4x4s were built, with only 1004 right-hand drive examples sold in the UK. According to *howmanyleft.co.uk*, there are around 160 survivors, with less than fifty of that number on the road.

Riding the trend of rising classic car prices while interest rates are at an all time low, you should be budgeting no less than five grand for a Cavalier Turbo in average condition, with better examples commanding double that figure. Expect to pay much more for minters. Here's what you need to know if you fancy seeing one of 'em parked in your garage.

BUYING CAVALIER TURBO 4X4

IDENTITY

A Cavalier Turbo's VIN number is displayed on the identity plate riveted to its slam panel. The chassis number is stamped into the floor between the driver's seat and sill. Make sure these correspond to the information listed on the car's V5, a document which should correctly list the car as 'Cavalier Turbo 4x4'.

The engine number is stamped into the front nearside edge of the block where it mates the gearbox bellhousing. On all-original cars, this should match what's displayed on the V5, but it may be a different series of digits due to the fact that so many Cavalier Turbos with missing engines have been saved from the crusher by owners who have fitted new powerplants.

You can check the car's MOT history at the DVLA website by visiting *bit.ly/checkhistory*. You'll need the car's reg number.

The service covers at least the past ten years of test information, including all passes, fails, advisories and recorded mileage. Throwing a couple of quid at *bit.ly/mycarcheck* is also a worthwhile exercise, one that will let you verify the claimed V5 information, as well as providing details of reg number transfers, colour changes, any recorded accidents, write-offs or outstanding finance. It's also a service that will guarantee your purchase if you use the supplied forms when completing the purchase of your new car.

BUYING CAVALIER TURBO 4X4

STANDARD TRIM

When introduced in October 1992, the Cavalier Turbo came with heated leather sports seats as standard. These were unique to the model. Albany cloth trim was offered as a reduced cost option. Beyond March 1993, the car's three-spoke steering wheel was replaced with an airbag-loaded part which many consider to be the ugliest Vauxhall steering wheel of all time. Confusingly, there are some early L-reg cars that feature the non-airbag specification.

In August 1993, a passenger's airbag was introduced as standard, along with a revised dashboard, an electronically-driven speedo and a Blaupunkt CD300 compact disc head unit (a much sought-after part today) coupled with options of air-conditioning and headlight wipers. Less obvious updates included a changed 4x4 ECU and redesigned lower control arms, although it's unlikely that any Cavalier Turbo will still be making use of its original arms today.

All Cavalier Turbos came with sixteen-inch 'fanblade' alloy wheels and a body kit inspired by that of the Mk3 Cavalier GSi2000. The Turbo's kit was largely the same, albeit with a revised boot spoiler and grille, plus the addition of a reflector-wearing boot lid insert panel and matching smoked rear light clusters.

You'd be forgiven for thinking as much, but no Cavalier Turbo rolled off the production line wearing a Renault Laguna splitter!

BUYING CAVALIER TURBO 4X4

COLOUR

As is the case with most great sports cars, the Cavalier Turbo was available to order new in only a handful of colours (no, none of them were Arden Blue!). Factory shades were Glacier White, Satin Red, Spectral Blue, Polar Sea Blue, Diamond Black and Smoke Grey. Watch out for white examples – many are former cop cars that led a hard life in service. Additionally, plod squad machines tend to lack a lot of the creature comforts and trim that make the Cavalier Turbo so desirable.

"NO CAVALIER TURBO LEFT THE PRODUCTION LINE WITH A LAGUNA SPLITTER!"

BUYING CAVALIER TURBO 4X4

TRANSMISSION

The Getrag F28 six-speed gearbox is brilliant and tough, although it has never been praised for slick shifting. Worn linkages can be replaced to produce firmer functionality. Gearbox oil should be changed regularly, an easy task that will surprise many with how much of a difference fresh fluid can make.

Driveshafts, CV joints and wheel bearings are close to indestructible. The car's propshaft is equally robust, but bearings do wear with age. They're no longer available to order from Vauxhall, but a propshaft specialist will be able to help.

The rear differential is well proven and can handle big power. Changing the part's lubricant is a good idea to keep bearings moving freely. Well, go on then!

The 4x4 system is where things get tricky. The transfer box contains a viscous coupling which regulates the amount of power being sent to the rear wheels. It can totally disengage under braking (in order to allow ABS to function independently on each wheel) via a hydraulic clutch. This function is controlled and regulated by an accumulator block, an accompanying accumulator bulb and a dedicated ECU.

Abuse or neglect has led to the demise of many transfer boxes. Tyre tread should have matching pattern and keep close to equal depth, with no more than 2mm difference from side to side. In the ideal world, you'd replace all four tyres at the same time, but budgets don't always allow for this behaviour. If that's the case as far as your own Cavalier Turbo is concerned, always replace tyres in pairs, swapping old fronts with old rears and fitting new rubber at the back. The purpose of this is to avoid mismatched rolling radiuses, a condition that causes the transfer box coupling to 'wind up' and its internal seals to fail. Severe abuse may also result in the destruction of the unit's planet gears or clutch rings.

Excessive lowering can also put strain on the transfer box. These days you will find many Cavalier Turbos running in front-wheel drive mode, either through the removal of their propshafts and/or simply by pulling fuse 19, thereby immediately disabling the system. It seems odd to dismiss one of the model's defining features, so we heartily approve of correctly functioning or modified (see separate boxout) transfer boxes that allow their host Cavalier Turbos to send power to all four wheels.

A standard 4x4 system's accumulator bulb should be replaced every 52,000 miles or ten years, whichever comes first. A simple test will inform you if the part is due for replacement: depressing the brake pedal with the ignition on should generate a 'whoosh' from the bulb. This should be heard each time you carry out the test, twenty times in quick succession. Any less than this number, and you're looking at a replacement accumulator bulb. Don't buy one from Vauxhall. Old dealer stock is likely past its sell-by date, so visit *cav16.co.uk* and buy a fresh part at a much lower price (£119.99 at the time of writing).

An illuminated 4x4 dash light will also indicate a problem, possibly a defective brake light switch that doesn't tell the 4x4 ECU when to disengage at the rear. The dash light may also suggest a faulty transfer box pressure switch.

Simple fault codes can be flashed, but detailed information can only be accessed by a dealer-issue Tech 1 (or Tech 1A) diagnostic machine. There are a few in the Vauxhall scene who have this trick bit of kit, so ask around. Else, it's off to a main dealer with you!

Straight-fit uprated single face or paddle clutches designed specifically for the Cavalier (and Calibra) Turbo can be bought direct from *www.bit.ly/cgmotorsport*

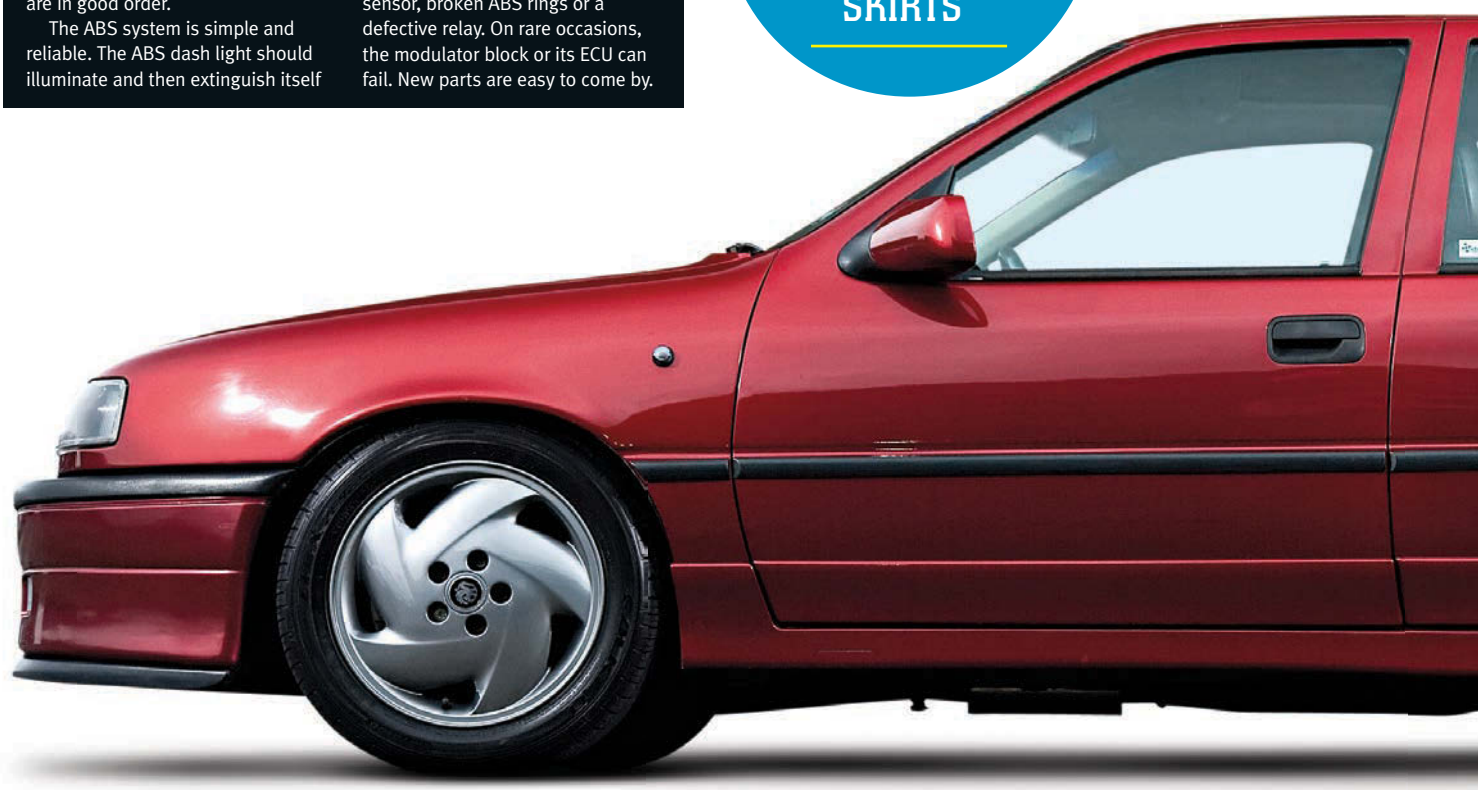
BUYING CAVALIER TURBO 4X4

BRAKES

Cavalier Turbo vented front discs measure 284mm with solid 268mm discs at the rear. Standard brakes are cheap and good for stock power, providing the parts and fluids used are in good order.

The ABS system is simple and reliable. The ABS dash light should illuminate and then extinguish itself after a couple of seconds of the ignition being switched on. If the light remains illuminated, then there's a problem. The most common culprit is a failed ABS sensor, broken ABS rings or a defective relay. On rare occasions, the modulator block or its ECU can fail. New parts are easy to come by.

"SILL ROT CAN BE EXPERTLY HIDDEN BY THE BODY KIT'S SIDE SKIRTS"



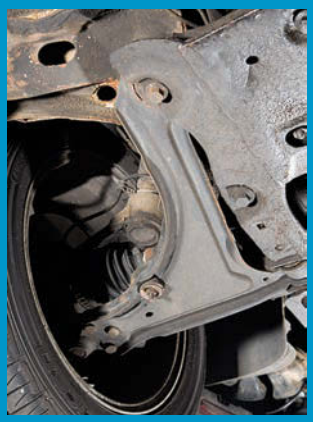
BUYING CAVALIER TURBO 4X4

SUSPENSION

Independent suspension features at both ends of the car, with MacPherson struts at the front and semi-trailing arms at the rear. It's rare to find a Cavalier Turbo running its original springs and dampers. Most will have been replaced, often with uprated parts.

Pay attention to lower balljoints, track rod ends, upper strut top bearings and lower track control arm rear bushes.

At the rear, the only bushes that give cause for concern are the main vertical subframe items positioned ahead of the rear wheels. These can split, but are readily available as replacement parts. Steering racks can become notchy with age, usually indicated by a tight spot when turning left. Fresh power steering fluid will help, but a replacement rack is the best fix.



BUYING CAVALIER TURBO 4X4

ENGINE

In a standard state of tune, the C20LET engine is very reliable, as is its Motronic ECU. With regular servicing, this turbocharged, two-litre unit is capable of very high mileage without error. It came with two different cylinder heads during its lifetime – a later part from GM and an earlier, more respected 'Coscast' head. There is no obvious pattern relating to which cars got which heads, but GM parts are known for becoming porous, encouraging oil to enter the cooling system.

Not all GM heads were affected, and many have been repaired or have had preventative measures taken in the form of oil gallery sleeving. In other words, unless there is clear evidence of oil in the engine's water supply, there should be no cause for concern. A quick Google search will produce images showing you how to identify a Coscast cylinder head.

Contaminated coolant can be attributed to head gasket failure, so check for uneven idle and billowing white smoke from the back end. Don't be alarmed by white smoke on startup from cars that rarely get used or those that have been sitting a while. This is simply condensation in exhaust pipework and should clear quickly.

Hydraulic tappets may chatter until engine oil reaches its correct temperature. Again, this is nothing to worry about.

Look for blue smoke from the rear. This will indicate unwanted oil seepage, potentially from the car's KKK16 turbocharger, a bhp booster integrated into the standard exhaust manifold and known for blowing its seals through hard use. It's a small turbo, meaning that it produces hardly any lag, making it very responsive. Rebuild kits can be bought, but many owners prefer to send the part to a specialist (such as Turbo Dynamics) for upgraded internals when repair is required.

C20LET service and maintenance parts are generally quite cheap. They can be ordered direct from Vauxhall parts supplier, Autovaux. The engine's timing belt should be changed every 40,000 miles. We recommend frequent oil changes (at least every 5000 miles), especially on cars that get used frequently. Wiring looms should also be regularly checked due to old electrical insulation drying out and causing broken circuits.

BUYING CAVALIER TURBO 4X4

INTERIOR

The Cavalier Turbo's Recaro front sports seats are excellent, but they're prone to wear and crushed bolster foam inserts. The seats can be stripped, repacked with foam and any broken mounting points can be welded. The best cure, however, is prevention, so make sure the leather in the car you're about to buy is regularly cleaned and moisturised using professional automotive interior car products, such as those available from *www.bit.ly/cambridgeconcours*

All Turbos were offered with a seven-function trip computer (positioned in the dash, but operated by awkwardly-placed buttons around the handbrake), electric windows, electric sunroof and electric aerial. Central locking can be problematic, but replacement relays are easy to come by.

A soggy passenger foot well can usually be traced to a blocked 'elephant's trunk' (the scuttle panel drain hose located in the engine bay against the bulkhead). Over time, this part gets clogged with dirt and leaves, causing rainwater to drain at a slower rate than it is accumulated. With nowhere to go, mucky fluid overflows, eventually finding its way into the cabin. Keeping the hose free of dirt should be observed as part of routine maintenance. Many owners chop the angled bottom of the hose to prevent further blockages.

BUYING CAVALIER TURBO 4X4

EXTERIOR

As is the case with all Vauxhalls built during the 1980s and early 1990s, rust is the Cavalier Turbo's principle enemy. Surface rust can appear around the rear wheel arches, along the bottom of the doors and wings, around windscreen seals and on the panel beneath the grille (a magnet for stone chips that encourage corrosion). Also check the inside bottom corners of the boot lid, the corners of the floor beneath carpet around the rear lights, and the rear suspension turrets. Surface rust is treatable and of no huge concern, but there are areas of the model prone to terminal corrosion, chiefly the rear chassis legs and spring seats. If possible, raise the car and have a look at these areas for signs of trouble.

Have a good look at the front floors, both inside and outside the car. Thick soundproofing material sits atop factory bungs which can be lost over time. Their absence enables water and debris from the road to be absorbed by the material, essentially allowing a massive layer of soaked foam to sit between the carpet and floor pan. This will cause metal to rot, and can be exacerbated by the trolley jacks of idiots who lift the car by its floor instead of its proper jacking points.

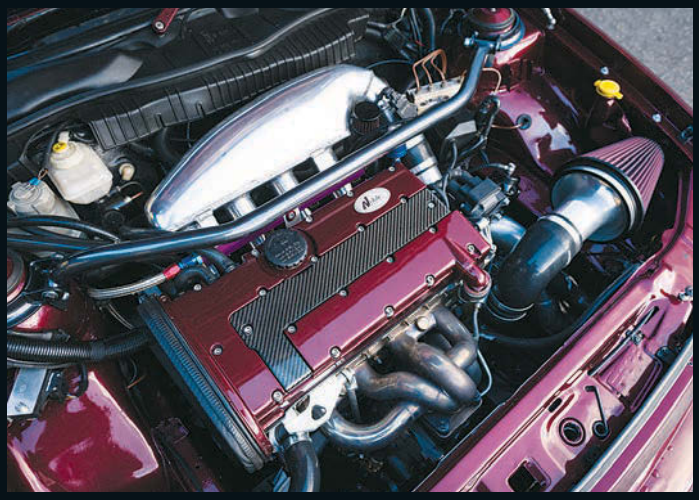
Rear arch replacement is common, but it's a skilled job. Telltale signs include swage lines being 'on the piss' where the rear arch meets the rear door. This isn't necessarily something to worry about, but if detected, asking the seller about evidence or repair work will tell you whether he or she is being honest about the car's history. Oh, and keep in mind that sill rot can be expertly hidden by the car's body kit side skirts. Inspect as thoroughly as you can.

TUNING CAVALIER TURBO 4X4

ENGINE

C20LET tuning has come a long way in recent years. Heck, we've featured Cavalier Turbos chucking out a good 500bhp, but there's no way you'll achieve that power with standard engine management and unaltered engine internals. Sturdy steel connecting rods and Wössner forged pistons can be bought as a reasonably priced package from PEC, while a Supertech valvetrain and uprated camshafts from the likes of Piper are also available.

The Motronic electronic brain found inside the car (driver's kick panel if you're having a butcher's), isn't mappable, and can only accept chipsets. Ranging from Phase 1 to Phase 5, the most commonly found are those from VMAXX or German tuning outfit, EDS, but in today's world of modified motors, these prehistoric parts just don't cut it. After all, they work on the assumption that you've fitted a specific selection of tuning products to your car, meaning that they won't be able to get the very best out of parts not taken into consideration.



The only way to properly tune a C20LET is to start with the assumption that you'll need to invest in an engine standalone management system, such as those from Omex, Emerald, MBE, Syvecs or DTA, although there are examples of C20LET cars running mappable Vauxhall Z20LET ECUs and wiring, so this may be a more cost effective solution depending on the budget you're working with.

The Cavalier Turbo's intercooler is tiny and in a ridiculous position in the engine bay – it's attached to the side of the radiator where it gets limited exposure to airflow. Fitting a bigger intercooler is a must, but judge the size of the required intercooler by the power figure you're aiming for; buying an intercooler the size of a house and then fitting it to a car pumping out no more than 300bhp will most likely cost you valuable performance.

Intercooler technology has advanced rapidly in recent years, meaning that punchy, universal 'coolers can be bought from a variety of sources. Mishimoto offers big power products in discreet sizes (the Amercian manufacturer's Race Edition J-Line series is rated at 500bhp and fits snug behind a modified Cavalier Turbo front bumper), while TX Autosport provides slimline alloy radiators and enlarged inlet pipework.

Replacing the car's standard exhaust manifold with a tubular part and a standalone turbocharger will set you on the right track to big power. You'll also need to consider uprated fuel equipment. Bigger injectors and fuel pumps can be bought from Sytec, ASNU and Vauxhall race car preparation outfit, Relentless Performance.

TUNING CAVALIER TURBO 4X4

TRANSMISSION

As mentioned earlier, CG Motorsport supplies direct-fit performance clutch kits for the Cavalier Turbo's Getrag F28 six-speed gearbox. There are also parts available to enable the car's 4x4 system to operate without the aforementioned troublesome hydraulics. The popular transfer box locking kit made by Vauxhall scene stalwart, Mike Hayward, comes highly recommended.

Mike's kit (used to great effect by rally teams around the world) works by replacing the transfer box's original clutch rings with much thicker parts, essentially locking the box's internals and permanently engaging drive to the rear wheels. As the hydraulic clutch is no longer needed, the accumulator block, its big ol' bulb and the 4x4 ECU can be removed, creating lots of space in the engine bay. A Cavalier Turbo with a locked transfer box shouldn't be suspend towed nor tested on an MOT test centre's brake rollers unless the propshaft has been removed, but the benefits of fitting the kit massively outweigh this minor inconvenience. Visit *www.bit.ly/txbsolutions* for further information and to place your order.

TUNING CAVALIER TURBO 4X4

SUSPENSION

When lowered, the Cavalier Turbo's rear wheels camber negatively. This condition will eat the inside edge of tyres in no time, potentially damaging the transfer box as it does so. We'd recommend a drop of no more than 40mm on quality springs (e.g. Eibach Pro-Kit parts). Fit a premium set of dampers too, such as Bilstein yellows or Koni Sport adjustable shocks.

Polyurethane bush manufacturer, Powerflex, produces a comprehensive range of parts to stiffen the Cavalier Turbo's chassis. Whiteline once manufactured uprated anti-roll bars for the car, although finding these parts today is like looking for the proverbial needle in a haystack.

TUNING CAVALIER TURBO 4X4

BRAKES

If working to a small budget, new OEM discs with fast-road EBC Redstuff pads are a good combination. Yellowstuff pads are also very good, but will require longer journeys and harder braking to come into their own. Read our braking systems Q&A on page 48 for a more detailed explanation regarding pad technologies.

Goodridge makes uprated brake hoses for the Cavalier Turbo. Many aftermarket brake manufacturers can supply big brake kits, although fitting them may require you to order custom brackets. If you're gonna do that, then you might want to think about the more cost-efficient fitting of OEM calipers from another performance production model before parting with your hard-earned cash.

CONTACT

Mk3 Cavalier Owners Club
www.vauxhallcavalier.com

Performance Engine Components
01347 838174
bit.ly/rodsandpistons

Mike Hayward's 4x4 transfer box locking ring kits
bit.ly/txbsolutions

CG Motorsport
0113 242 6359
bit.ly/cgmotorsport

Relentless Performance
01487 842661
bit.ly/relentlessperformance

Autovaux
01924 376003
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Mishimoto
01384 897476
www.bit.ly/mishimotouk

TUNING CAVALIER TURBO 4X4

WHEELS & TYRES

Regardless of whether you decide to retain the Cavalier Turbo's standard wheels and their 205/55/16 profile tyres, the car you're about to buy should always wear good quality rubber. Look to manufacturers such as Falken, Toyo, Bridgestone, Nankang or Yokohama. Of course, swapping wheels will make a massive difference to the look and feel of your car (more on that in our next issue), but you probably don't want to go any higher than nineteen-inches in diameter. It's worth noting that wheels from similarly aged performance Vauxhalls are a direct fit to the Cavalier Turbo.

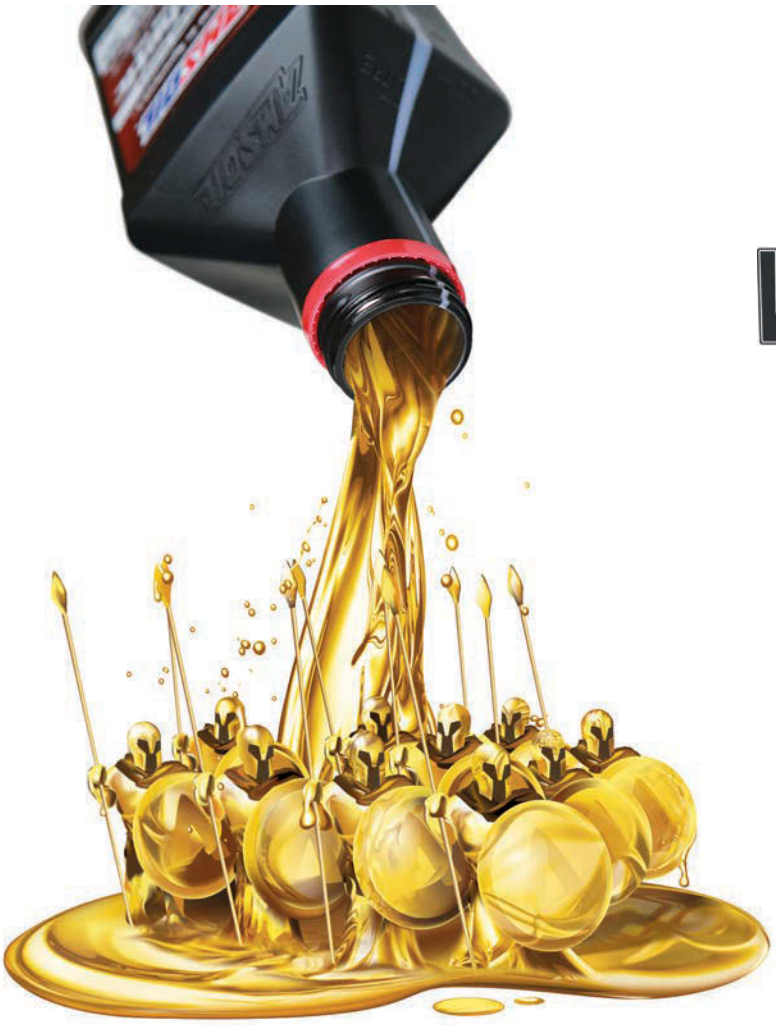
TUNING CAVALIER TURBO 4X4

INTERIOR

With or without factory leather sport seats, a Cavalier Turbo's cabin is well equipped, but it may be in need of cosmetic attention. Cracked dash trim is a common complaint.

Freshening the standard seats would be our first fix, but if you're after a different look altogether, then aftermarket bum-huggers are the way to go. Either way, careful care and maintenance is a must.

Steering wheels, gauges and ICE can all be swapped, as can the car's branded clock cluster; the German version of the Cavalier GSi2000 (known as the Vectra A 2000) was offered with a cost option of a model-specific digital dash. Limited to just 500 units, the backlit display looks like a cross between that of the Mk2 Astra GTE and the LCD display in a Carlton GSi3000. Nice!



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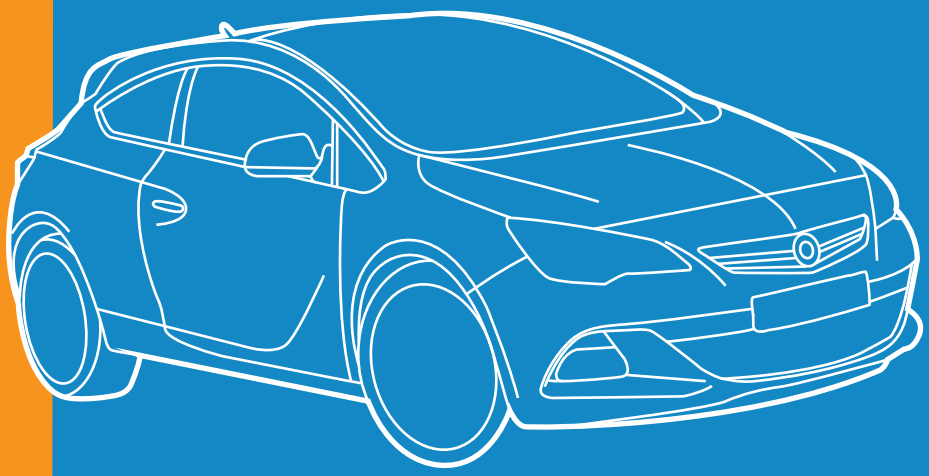

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HALL of FAME

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Fancy seeing your Vauxhall in our Hall of Fame? It doesn't matter if you've modified the latest VXR or a classic retro ride, we want to see your cool creation! Email a brief spec, a few pics and a bit about yourself to dan.furr@kelseymedia.co.uk. We'll get back to you ASAP.

More of your magnificent machines...

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Andrew Abbott

Sebastian Krakel

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Robyn Hill

Ainsley Makin

Kenny Dobell

Skye Mackie

Kieran Jones

Cheddar Wallace

Kevin Stevenson

Lynsey Timmins

Russ White

THE PV FLEET/THIS ISSUE

DAN FURR IRMSCHER MV6

BOUGHT 2010
STATUS Naff all happening with the MV6, but where there's a will, there's a way...

DAN FURR CAVALIER TURBO

BOUGHT 2012
STATUS Transfer box locking rings promise to deliver permanent four-wheel drive.

DAN FURR VECTRA VXR

BOUGHT 2015
STATUS Touring car specification brakes get fitted to the VXR in advance of PVS.

JULIAN ZAFIRA 1.9CDTi 150

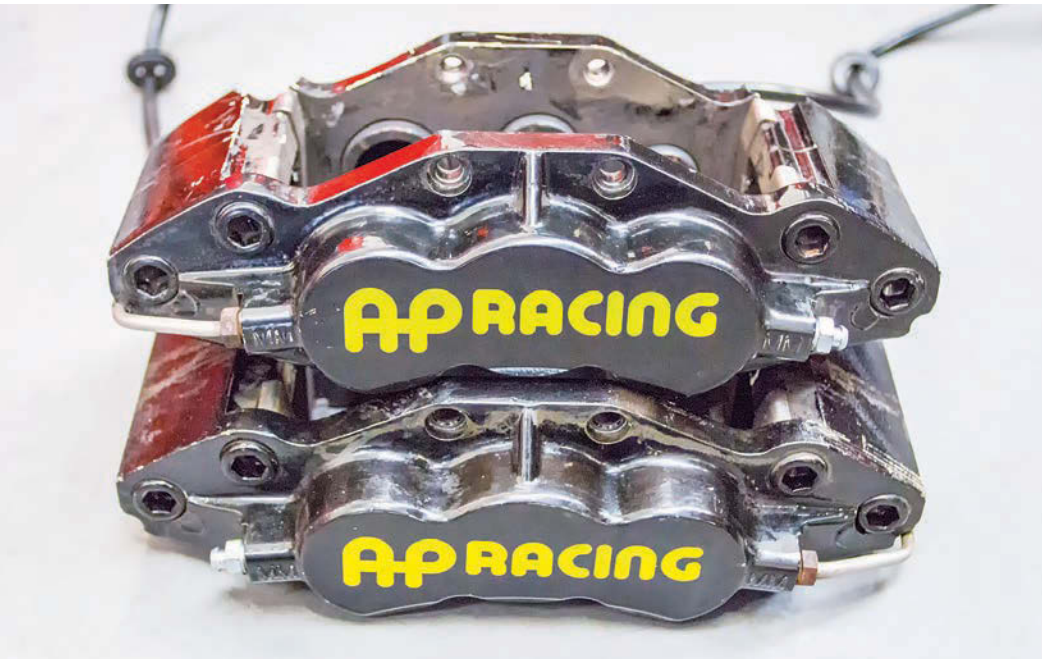
BOUGHT 2016
STATUS Worn OEM stoppers make way for EBC grooved rotors and Greenstuff pads.

DAN FURR **VECTRA VXR**

SIX PACKED

Vectra VXR brakes are a desirable upgrade for owners of Vauxhalls with smaller stoppers, but I wanted to improve upon my Arden Blue beast's standard braking equipment after the installation of a K&N air filter, MW Performance (MWP) three-inch double decat exhaust pipework and a tweaked Superchips Stage 2 map which increased power to 320.15bhp and 422.9olb/ft torque.

Back in 2007, AP Racing supplied Vauxhall and its BTCC partner, Triple Eight Race Engineering, with six-piston TOCA brakes for the championship's amazingly successful Vectra VXRacing touring cars. Continuing the link to the Vectra VXR road cars, a special order AP Racing six-pot kit with 362mm discs, alloy bells, racing pads, Goodridge braided hoses, DOT 5.1 fluid and caliper castings identical to the BTCC parts was offered through the much-missed VXR Performance Centre. Essentially, an owner of a tuned Vectra VXR could match his or her car's engine performance with brakes that were more or less the same as those being used to good effect in the nation's top tier motorsport. The only snag was the two grand price tag. Needless to say, with close to only 700 Vectra VXRs produced, not very many of these AP kits were sold when new, making them very difficult to get hold of today.

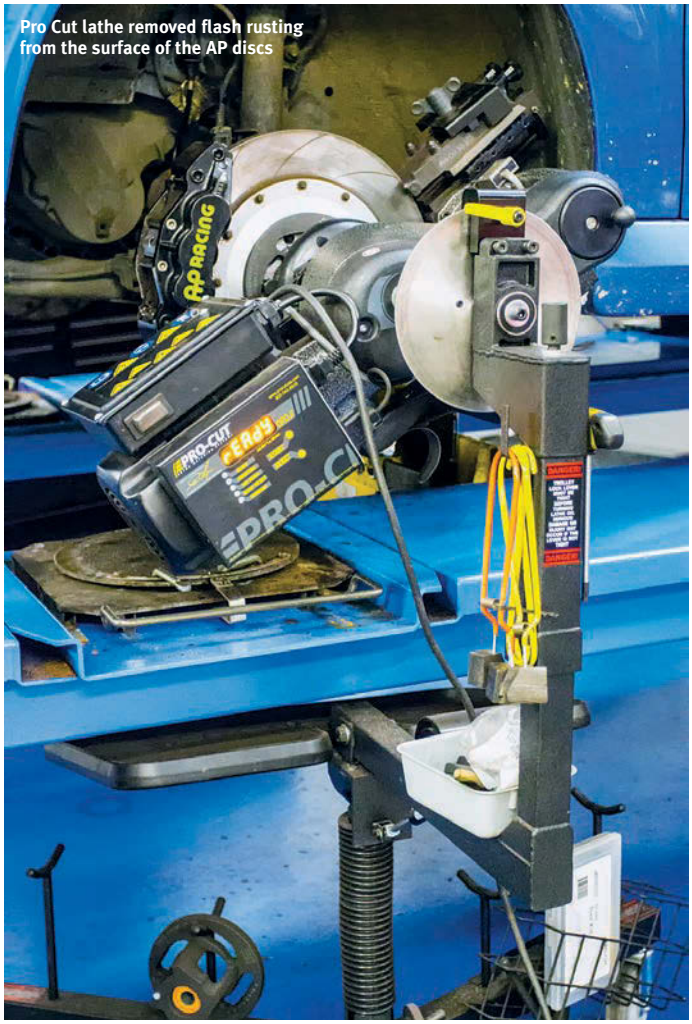


I asked MWP owner, Marc Wale, to let me know should he come across a set of the super stoppers. Sure enough, that's exactly what he did! The kit had been supplied brand new by MWP to one of its Vectra-owning customers a short while ago. Reyland Motorsport mounts and bells were sourced, as were calipers the same as those offered by Vauxhall a decade ago. The only notable difference is the colour; VXRacing calipers could be ordered in blue or red with white lettering, whereas MWP's direct-from-AP calipers are black with yellow graphics.

The kit returned to Marc's Cheshire workshop on an accident-damaged VXR he bought as a parts donor. I was only too happy to relieve the car of its big brakes. As you'd expect, they were a direct fit to my own VXR (as demonstrated by MWP technician, Matt Duffield, before Marc lightly skimmed the face of each disc with his handy Pro Cut lathe), although my decision to replace standard nineteen-inch wheels

Goodbye, OEM brakes!

AP 362mm discs are significantly bigger than stock VXR rotors



Pro Cut lathe removed flash rusting from the surface of the AP discs

with Irmscher eighteens means that there's less than a Rizla paper's width of clearance between caliper and rim!

'Night and day' is a term of comparison favoured by many prone to exaggeration, but that's just how much of a difference there is between the VXR's factory brakes and the AP kit; the car pulls to a sudden stop without me having to stamp on the brake pedal. Better still, it halts from high speed in a manner than avoids unwanted steering interference. Top banana!

My plan of action is to colour-code the bells and apply all-new AP rotor fitting hardware, but a lack of time prevented me from carrying out these jobs in advance of the car's appearance on the main stand at PVS (where it was joined by MWP's Astra GTC VXR and Insignia VXR development vehicles). The immediate task on my 'to do' list, however, concerns a faulty oil pressure switch. More on that in my next update.

THANKS

MW Performance
01244 671111
www.mwperformance.co.uk

DAN FURR **CAVALIER TURBO**

TRANSFER OF POWER

I couldn't let an issue of *Performance Vauxhall* celebrating the Cavalier Turbo pass without including an update on the progress of my own project. I've been continuing to stockpile performance parts for the car's powerplant, bending the ear of respected C20LET builder and MIGweb hero, Steve Milton, as I go. I'm looking forward to getting the car up and running under its own steam, but it's not just enhanced engine equipment that will precede its return to the road.

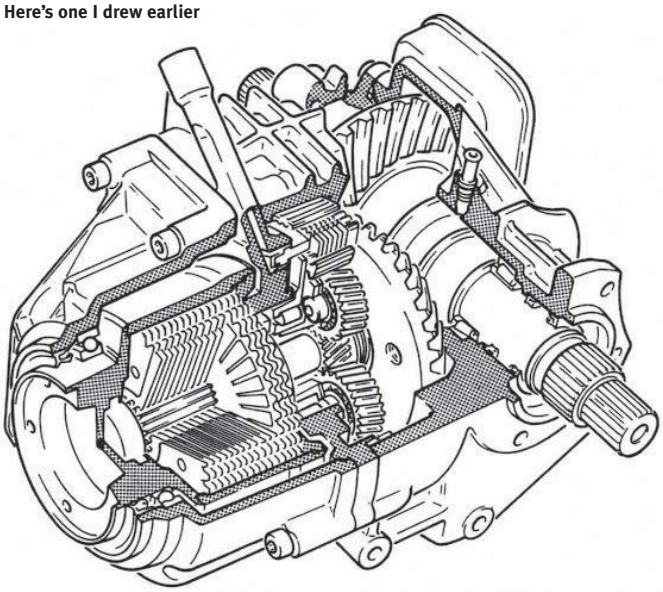
Every aspect of the car is being overhauled. Fresh body panels and paint, polycarbonate windows, uprated suspension, re-trimmed cabin furniture, bigger brakes. You name it, my Cavalier Turbo is getting it! Upgraded transmission components are also high on my shopping list, which is why I contacted Mike Hayward, the 'go to' guy for Cavalier (and Calibra) Turbo transfer box locking solutions.

Bearing in mind its role as the most important part of the model's four-wheel drive system, it's worth taking stock of how the transfer box works. Essentially, a hydraulic clutch manages the amount of power being sent to the rear wheels. You'll read elsewhere in this magazine why Vauxhall thought this was a good idea, but it's useful to know how the system operates before you understand the reasons for converting a transfer box to permanent four-wheel drive using Mike's kit.

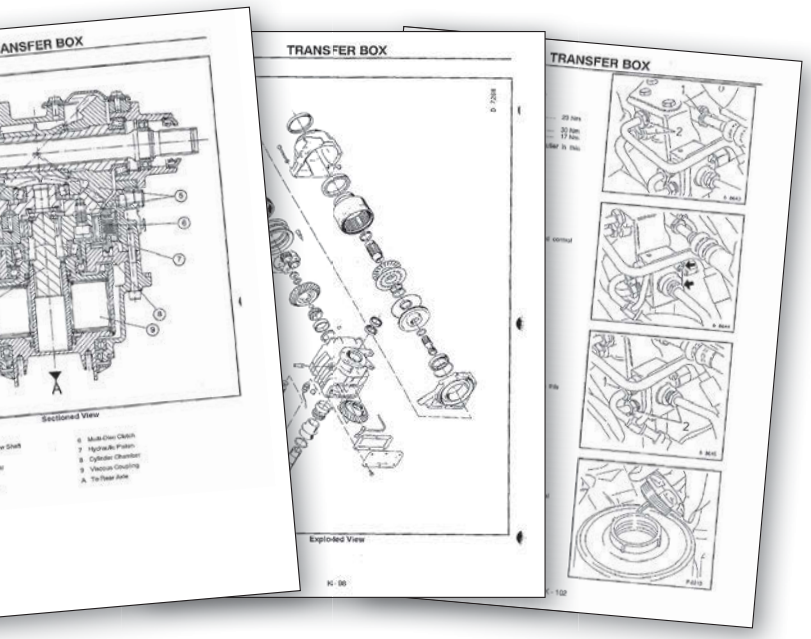
In what is advanced technology when compared to the simpler four-wheel drive systems fitted to Ford's similarly-aged RS Cosworths, a viscous coupling (the part of the transfer box that determines how much drive should be sent to each end of the host vehicle) features inner and outer steel rings immersed in an application-specific silicone. Under normal driving conditions, the drive is split 75/25 (front/back) with wheels rotating at the same speed. The inner and outer rings (connected to front and rear drive respectively) inside the transfer box also turn at the same speed. They do not ever come into contact with one another – they're separated by the aforementioned silicone.

If the rotational speed of the front wheels alters through losing grip, the change will be reflected by the inner rings inside the transfer box. The subsequent difference in speed between the inner and outer rings means the silicone won't be able to flow freely, a condition which increases its operating temperature. In turn, this raises viscosity. The spinning rings are then unable to rotate unhindered, causing them to 'lock', resulting in more power being sent to the rear wheels before grip is achieved and normal driving conditions are resumed.

Here's one I drew earlier



Ordinarily, this activity is simply a consequence of the driving and road conditions you encounter, and is just how the manufacturer intended the system to work. Where tyre tread depth is uneven at each end of the car, however, the difference in wheel rotational speed has the same effect as losing grip, causing the transfer box



We won't be needing this anymore...

rings to rotate at different speeds and the silicone to increase in temperature and viscosity. In other words, poorly matched rubber causes the silicone to generate constant high heat whenever the car is in motion, culminating in hydraulic clutch failure and a broken transfer box!

Mike's solution to this problem is to do away with the box's ability to adjust the amount of power it sends to the rear wheels. By installing a set of his laser-profiled steel locking rings, the silicone inside the unit can't be forced to increase in temperature, meaning the system can't kill itself through accidental misuse. Permanent four-wheel drive is achieved, as per the previously referenced fast Fords. As an added bonus, much of the Vauxhall system's supporting equipment (including pipework, 4x4 ECU, wiring, accumulator block, accumulator bulb etc.) is no longer required.

Chaps and chapettes I know who have already fitted one of Mike's kits to their Cavalier (or Calibra) Turbo say it's one of the best modifications they've carried out, one that reduces service and maintenance costs, delivers worry-free motoring and enables much more power to be fed through their car's transmission. Best of all, Mike's locking rings come with full fitting instructions, a copy of Vauxhall's transfer box workshop manual and a price tag of just £75 including delivery. All I need to do is find the time to fit 'em!

THANKS

Mike Hayward
Cavalier and Calibra Turbo
Transfer Box Solutions
www.bit.ly/txbsolutions

JULIAN **ZAFIRA 1.9 CDTi**

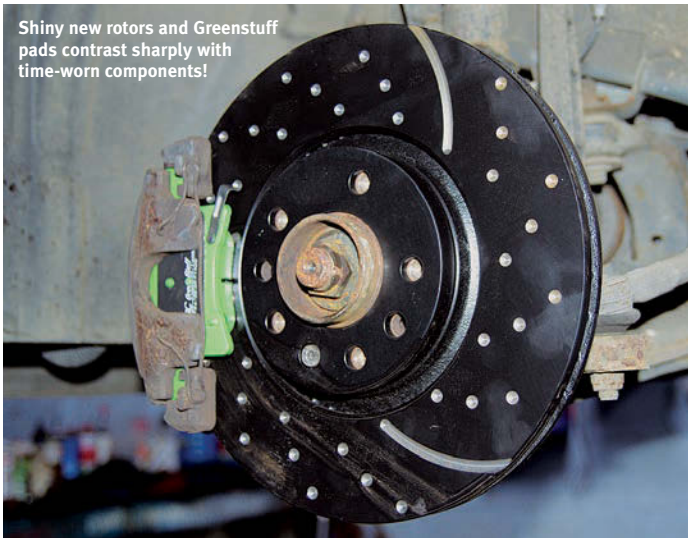
BRAKING GOOD

The Zafira's front brakes had been registering their need for replacement by squealing on one side. A little investigation revealed nothing too worrying, but it was clear that the standard-spec pads and discs were beyond their best (the disc edges appeared to to be lipped and showed signs of corrosion). I live close to the sea, and the damp climate isn't exactly ideal when it comes to preventing metal from deteriorating!

I decided to replace the parts with improved specification components from British manufacturer, EBC Brakes. The company's GD Sports Rotors were my disc of choice. Featuring wide aperture 'full sweep' slots that draw cool air under the accompanying EBC Greenstuff pads I ordered (thereby reducing pad contact temperatures that might otherwise result in brake fade), the design of each disc helps to expel dirt, dust, debris and water whilst maintaining a flat and parallel pad surface. The black finish you can see is a special thermic coating claimed to offer long-lasting resistance to corrosion. Perfect for the Zaf's life on the coast!

After fitting the parts, I took the ol' bus onto the Preseli Hills near my home in West Wales. There are some great twisty roads in this neck of the woods, terrain that has a habit of throwing up unexpected tight bends and the odd

Old factory-spec discs and pads; corroded and sub-standard performance



Shiny new rotors and Greenstuff pads contrast sharply with time-worn components!

wandering sheep! It pays to know the roads reasonably well before letting rip, and, of course, it makes sense to have decent stoppers sitting behind your car's alloys.

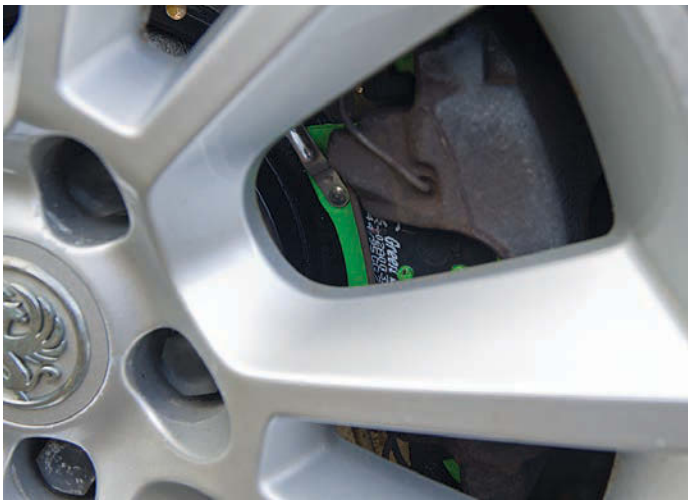
Right away, I noticed that braking was vastly superior with the EBC kit in place. I felt confident enough to give it some beans around sharp corners before slamming on the anchors. It was great to have this newfound confidence in the car's abilities, especially when I found myself climbing a steep gradient with a car and a milk tanker ahead of me. Deciding to drop a gear in readiness for a sly overtaking move, I hit the gas and pulled out, only for a stray sheep to make a run across the carriageway ahead. I don't mind admitting to you that I expected some mutton-meets metal carnage! I immediately stood on the brakes, nearly launching myself over the dash in the process, such is the effectiveness of the EBC kit when compared to the OEM discs and pads I've been used to.

It comes as no surprise to me to learn that Greenstuff has become EBC's best-selling sports pad, offering medium dust deposits with vastly enhanced braking over standard parts. Greenstuff is ideal for fast road vehicles, with tests proving that the new, softer compound stops a car from 60mph almost twenty feet quicker than factory equivalent parts. Lucky sheep!

THANKS

EBC Brakes

www.ebcbrakesdirect.com



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F-type

FB VX-490

1964, £2,800. Very good condition, no welding needed. MoT Feb 2018. Needs tlc to paintwork. Just had new plugs, points and dizzy cap and leads. Very good runner. Cheshire. 01829 261167 (RB)

Astra

ASTRA MERIT

1995, 36,000 miles, £695. Very good sound original condition, 1400 cc, auto, drives perfectly, power steering, stereo, later alloys fitted, original plastic wallet, 7 months MoT. Kent. 01689 861196

Carlton

CARLTON GL

1986, 82,000 miles, £1,500. 12 months' MoT, very good engine and running gear, very good original body, inside is like new, phone for full details. Suffolk. 07831 462040

Frontera

FRONTERA JEEP

75,000 miles, £POA. In very good condition, diesel, auto gear box, needs attention. 01267 232897. Carmarthenshire (SN)

Nova

NOVA

1987, £300 ono. 4 door saloon. New wings plus other parts. Lots of spares. Runs. Northants. 01536 269386 or 07842 723923 (PB)

NOVA

1987, £150. Spares or repair. Runs. On Sorn. Lots of spares. Northants. 01536 269386 or 07842 723923 (RB)

Omega

OMEGA MV6

2001, £650 ono. Auto 2.6, metallic silver, MoT till Feb 2018. This car is in lovely condition. only a couple of age related marks, interior has no rips or tears. Drives nice and smooth. Worcestershire. 07881 775521 (SN)

Vectra

VECTRA 2.0 SRI

2000, £300. No MoT. SORNED. Excellent runner. Bodywork good. Alloys with Avon tyres. Recent head gasket and cam belt. Loads of paperwork. Full V5. Lincolnshire. 07591 657789 (PB)

VECTRA VXR

2006, 87,626 miles, £POA. 250 BHP, 1 owner, very good condition, 12 months MoT, genuine car and viewing highly recommended, Vauxhall FSH, 1/2 leather, CD player. 07779 330084 (SN)

Victor

FB ESTATE

1962, £3,000. Good condition, no rust. New MoT. Bath. 01225 442946 (SN)

Wyvern

WYVERN

1953, £6,500. Running restoration. Only small jobs left to do. No offers. Would exchange for 30-40 car or van. Cash either way. Middlesex. 01895 237820 (PB)

Combo

COMBO CDTI VAN

2005, 112,000 miles, £995. 2 owners. Service history, side loading door, cage and boarded out, MoT Jan 18. Private use only. Immaculate condition. Essex. 07754 802379 (HR)

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1961, £Up to £7,000, Wanted. Estate or saloon. 'F' type. Essex. 07984 960286 (PB)

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4X RS FOUR SPOKE WHEELS

£600. Full professionally refurbished and never been on car since refurb. Stunning looking. Complete with 4x Nankang 175/50/13 72v tyres again never been on rims. Kent. 07850 882512 (RA)

ALPHASUD BONNET

£25. For sale. Oxfordshire. 07532 208675 (RA)

BEDFORD CF/VICTOR ENGINE

1974, 57,000 miles, £400. Vauxhall Victor engine 1800cc. Petrol. Good condition. Including starter, carburettor, etc. Kent. 01303 244686 (PB)

LIGHTS

£100 inc p&p. One front light, 3in dia. One rear twin light, 4in. Auto jumble lot. Both as new. West Sussex. 07527 635372 (RB)

MARCHAL HEADLAMP

£25 ono. Headlight 7 inches with bowl and gasket. Oxfordshire. 07532 208675 (RA)

NEARSIDE FRONT WING

£20 ono. Vauxhall Calibra. Undamaged, some surface rust in places. Blue.Indicator repeater lenses as well.Would have to collect. Bridgend. 07837 514237 (MC)

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£100. Full head gasket set. 5 x oil filters. Brand new oil filter adapter with new canister-still boxed. Oxfordshire. 07988 043200 (RA)

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VAUXHALL ASTRA G

£Various. Brand new rear bumper, £30. Irmscher front grill, £25. Offside and rearside electric heated mirrors, £20 each or £30 for pair. Berkshire. 0118 983 4042 (PB)

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WCT 352

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All information correct at time of going to press, but if Dan gets his hands on the 587bhp VXR8 GTS-R, then we might fill every page of our next issue with nothing but supercharged joy. You have been warned...

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The Forged Monoblock technology is standard on all front and majority of rear KSport brake kits from 286mm up to 444mm.

The new KSport calipers are a huge step up over the design traditionally used in brake kits within the fast road and track market. Rather than being a two piece cast caliper, KSport now use the same Forged Monoblock technology only normally found in the top end supercars and high end race cars. The advantage of using Forged Monoblock rather than the usual two piece cast design is much greater caliper rigidity.

Every step forward in reducing caliper flex can be felt directly through the drivers foot as an improved and firmer pedal, with more immediate braking response. Excessive pedal movement is often due to the caliper halves flexing apart, whereas the KSport Forged Monoblock design ensures all pressure applied to the pedal is transferred directly to pushing the pads against the rotors.

KSport also utilise a caliper retaining piece that acts as a substantial bridging support to further increase rigidity.

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- Large diameter racing grooved rotors
- High quality braided brake hoses
- Mounting brackets and complete install pack

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380mm 8 Pot	400mm 8 Pot	421mm 8 Pot	444mm 12 Pot

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