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BREAKING THE RULES



There's a popular train of thought suggesting a car can never be as good as it is in factory specification. Those promoting this theory will suggest the manufacturer has spent millions developing the model in question and therefore it really is as brilliant as it can ever be. The problem with this belief is not recognising a car maker has likely developed the vehicle to appeal to the broadest possible audience and to satisfy wildly different emissions legislation across various territories. When it comes to classic cars, there's the additional argument modern technology can replace outdated equipment and, in doing so, improve performance, reliability and safety.

Don't get me wrong — there is little in this world as awe-inspiring as a factory original air-cooled Porsche, especially if the car happens to be a model produced in limited numbers. You know the sort: 911 R, S/T, 935, 550 Spyder. Thing is, though, from the word go, Porsches were primed for personalisation — the manufacturer might not have advertised the fact, but individual equipment could be optioned on its production models from the off. Owners applying upgrades and accessories by way of aftermarket tuning and styling kit is the logical progression.

Fast-forward to the present day and we find ourselves in the age of the Porsche restomod: air-cooled classics subjected to extensive restoration, with modern technology replacing old componentry in a bid to make Zuffenhausen's legacy models better equipped to keep up with modern traffic and to serve as capable sports cars on today's roads and race circuits. The wealth of tuning components now available for every aspect of an air-cooled Porsche is mind-boggling, from engine upgrades to transmission, suspension, interior, bodywork, braking and electrical items. In fact, when it comes to configuring your dream classic Porsche, the only limit is your imagination. Okay, your wallet might also be strained, but restomods are essentially an owner's form of self-expression, where creativity and driving style combine to produce something unique. It's an exciting scene to inhabit and I suspect the best is yet to come. ✪

UPGRADES BY WAY OF AFTERMARKET TUNING KIT IS THE LOGICAL PROGRESSION

Dan Furr Editor
@FurrsFleet

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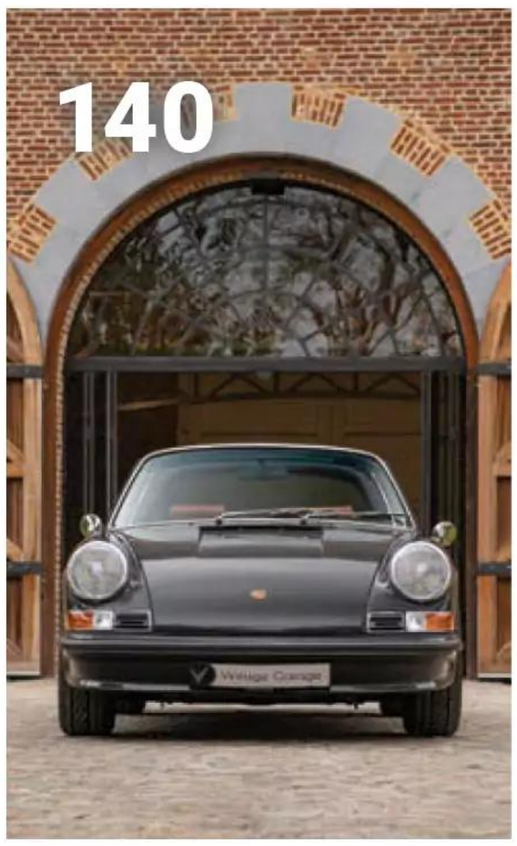
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NEW DIMENSION IN POWER

Claimed to be the first design of its kind since Mazda popularised the Wankel rotary engine, this radical radial powerplant is now in production following an exhaustive period of development and testing...

Words and photography **Richard Holdsworth**

One of the strangest Grand Prix race cars ever assembled is the exotic 1935 Monaco-Trossi, a front-wheel-drive, open-cockpit single-seater powered by a supercharged, air-cooled, sixteen-cylinder, two-stroke radial engine. In truth, the Monaco-Trossi was as odd at its time of manufacture as it is today, boasting a front-mounted powerplant with cylinders (and spark plug) pointing in an outward fashion from a centrally positioned crankcase. It's a configuration commonly used in vintage aircraft prior to the widespread adoption of gas turbine engines for aviation, but we'll wager all but a small minority of our readers know the design was ever used in an automotive application.

Seventeen years ago, Adelaide inhabitant, Nick Mebberson, revisited the idea and, along with friends, Loui Burke and Scott Pearce, decided to bring an efficient radial engine design for classic sports cars to fruition. The talented trio formed Radial Motion and, with a sizeable investment of $3,000,000 Australian dollars, their associated manufacturing company, Bespoke Engineering, is now putting this impressive engine design into production following a period of solid development and testing.

Inspired by the radial aircraft engines of the 1920s, the petrol-powered Radial Motion unit is currently a four-stroke radial configuration of three cylinders. It can either be developed as air-cooled or water-cooled and will eventually be offered in a choice of three, six or a humongous twelve cylinders, as well as in electric-hybrid format. It's compact in design, lightweight and making use of many already available components. Needless to say, Mebberson and his colleagues claim their unorthodox design to be supremely low-maintenance.

It can also be heavily tuned by specialists and enthusiasts — the three-cylinder launch engine is available to order in either two-litre or 2.1-litre variants with performance in the region of 100bhp per litre. Take it from us, the raucous sound of the exhaust is compelling, but we're getting head of ourselves. Let's take a look at the basics.

Unlike the aviation engines of yesteryear, Radial Motion's design doesn't use a master/slave rod layout. In place of this rather complex arrangement, the engine you see on these pages uses a common journal, much like those used in V-twin engines, resulting in a more compact design. This concern for packaging makes the three-cylinder offering perfectly suited to a Volkswagen Beetle, Kombi van or a diminutive Porsche. The Radial Motion engine also maintains strong ground clearance when compared to standard Porsche or Volkswagen boxers, and is said to offer better weight distribution. I can't help but observe, had this potentially revolutionary engine been around many moons ago, it might have curbed the desire of my 356 Speedster to depart a race track backwards. Ahem.

PISTONS, CONNECTING RODS AND VALVETRAIN EQUIPMENT LIFTED FROM THE LEGENDARY GENERAL MOTORS LS-SERIES OF V8s

There are other advantages, not least the use of readily available engine components, such as pistons, connecting rods and valvetrain equipment lifted from the legendary General Motors LS-series of V8 power units. Featuring an integral dry sump oil system, the motor also has low centre of gravity.

Bespoke Engineering has been providing a variety of engineering services — from invention to production — ever since the firm was established a few years ago. The small design team includes industrial and mechanical engineers, machinists and technicians, with commissions varying in size and complexity. With the Radial Motion project given the green light, Bespoke Engineering was in prime position to assist with full production. Mebberson tells us the company's initial aim is to produce engines for specialist use, including keen enthusiasts who own a classic car and want to create something unique. "Our radial engine suits retro Volkswagens and old Porsches perfectly, but we're receiving much interest from commercial operators enquiring about the potential for use of a modern radial engine in special vehicles or even industrial powerplants. We've also had interest from the Australian

Facing page Radial Motion three-cylinder powerplant is perfectly suited to older classics offering limited space in their engine bay



military, affording us the opportunity to work on a number of offshoot projects in this exciting space."

All of this sounds brilliant, and we applaud Mebberson, the Radial Motion team and everyone at Bespoke Engineering for turning dreams into reality, but the application which we thought might make *Classic Porsche* readers salivate is the special 356 race car fitted with a Radial Motion engine and owned by Australian motorsport legend, Ron Goodman.

The first of Ron's 356s to be fitted with one of these engines (yes, he plans to install more) is now running road tests before intended motorsport use. Fittingly, the car carries the name *Aero 356* and is being prepared for participation in the Shannons Adelaide Rally, the largest asphalt rally event held in the southern hemisphere. Hosted annually and offering a $25,000 prize pool ($10,000 handed to the outright winner), this massively popular three-day motorsport event attracts wild four-wheeled participants, including heavily modified 911s, Super Touring BMWs, classic Fords, Ferraris, Holdens and much metal from the Land of the Rising Sun, including plenty of specially prepared rally cars (chiefly Toyota Celicas, Subaru Imprezas and Mitsubishi Lancer Evolutions). In total, the event attracts close to five hundred entries each year.

HEAVILY MODIFIED 911s, CLASSIC FORDS, FERRARIS, HOLDENS AND MUCH METAL FROM THE LAND OF THE RISING SUN

Ron's motorsport exploits are celebrated in Australia, but he has also forged a reputation as a capable racer in the Americas and mainland Europe. Put it this way, his 1954 356 — built in accordance with historic racing regulations — has brought him across the finish line in first-place at the Rolex Monterey Motorsport Reunion, said to be the Holy Grail of historic racing in the USA.

Amazingly, he beat back a gaggle of highly capable (and expensive) machines, including wide-bodied 911s and purpose-built weaponry from Maranello. With this background, he couldn't resist the invitation to test a new Radial Motion engine — he was so impressed, he was one of the first enthusiasts to place an order. "I tried a Beetle fitted with one of these new radial engines and was blown away by the performance. I immediately recognised the potential for enhancing the power of a 356 and wanted to try a Radial Motion engine in one of my own Porsches, primarily in the interests of offering the conversion to customers of my own maintenance,

Above Beautifully engineered, the Radial Motion unit promises near 100bhp per litre and will soon be available in three, six and twelve-cylinder variants, as well as the option of hybrid-electric

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His Radial Motion engine is fitted to no ordinary air-cooled Porsche (if *ordinary* is a word one can ever use to describe these machines?!). He found the car in Queensland, brought it to his workshop in Sydney and began modifying. *Aero 356* started life as a basic 356 B T5 built in 1960, but now carries an aluminium floor pan in place of standard steel. In fact, pretty much everything has been lightened. For example, the windows are made from Lexan, a polycarbonate resin thermoplastic said to have impact strength up to three hundred times greater than that of glass and thirty times that of acrylic. A purpose-built dashboard has been fashioned by Ron's in-house craftsmen, and though Porsche torsion bar suspension has been retained, the entire chassis has been strengthened and stiffened for race car duties.

The front spindles have been custom fabricated to allow optimised caster and camber, while disc brakes now feature in each corner. The standard 741 transmission has been retained (you'll be pleased to learn it's fully compatible with the Radial Motion engine), but makes use of a selection of different gear sets to suit different circuits and surfaces. A limited-slip differential keeps the car planted, equipment needed more than ever since the installation of the powerful radial motor, which Ron is testing to the limit by feeding the manifolds with a shot of nitrous injection whenever he wants his potent Porsche to reach warp speed. When we said he was putting the new engine through its paces, we weren't kidding you!

WE'RE DELIGHTED TO REPORT PERFORMANCE, RELIABILITY AND DURABILITY HAVE, THUS FAR, PROVED BULLETPROOF

We're delighted to report performance, reliability and durability have, thus far, proved bulletproof. Across the following pages, we've brought you a more detailed look at the Radial Motion engine, not to mention Ron's real-world findings behind the wheel. Suffice to say, in a scene obsessed with alternative fuel types and a move toward electrification, and notwithstanding the radial powerplant's origins in the days of early aviation, it's great to see serious investment of time and money in a new internal combustion engine aimed squarely at owners of cherished classic cars. And if Ron's early experiences are anything to go by, we have no doubt Radial Motion's order books will be busy. ✪

Above Ron Goodman on his way to victory at the Monterey Motorsports Reunion bash

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WORLD IN MOTION

We take time out to speak with Nick Mebberson, Managing Director of Bespoke Engineering, to find out more about the Radial Motion engine...

Words **Dan Furr** Photography **Bespoke Engineering**



Above Nick Mebberson, Managing Director of Bespoke Engineering and Radial Motion

Facing page Radial Motion three-cylinder engine fitted into the engine bay of Ron Goodman's 356 Outlaw

Let's start with the basics: what exactly *is* a radial engine? Put simply, it's a design of engine where the cylinders are arranged around the crankshaft, much like spokes on a wheel. The design is also commonly referred to as a 'star'. Indeed, in Germany, radial engines are known as *Sternmotor* (star motor) because the cylinders 'radiate' outward from the crankcase, like a stylized star. This design was popular with manufacturers of aeroplanes prior to the arrival of gas turbine engines.

In aircraft applications, radial engines are sometimes confused with rotary engines, in which the crankcase is connected to a propeller, which rotates around a stationary hollow crankshaft, through which fuel castor oil is drawn. Whilst rotary engines dominated the skies in the early part of the first World War, the design proved limiting and caused pilots to suffer severe diarrhoea as a consequence of the amount of castor-filled exhaust fumes they were inhaling. Not nice. Even so, the radial arrangement is ideal in an air-cooled aircraft engine because all cylinders are in a single 'plane'. Conversely, in boxer engines, the rear cylinder cooling air is blanked by the cylinders at the front, requiring tinwork and pressure plenums for cooling and the adoption of large fans when used in automotive applications. What else is unique about traditional radials, though?

Nick Mebberson, Managing Director of Bespoke Engineering (the company responsible for the design, prototyping and precision manufacturing of the three-cylinder radial engine fitted to the 356 showcased on the previous pages) answers our questions.

How does a radial engine differ from a more traditional layout?

Single row radials always have odd numbers of cylinders — three, five seven, nine and so on — because every second cylinder fires, which ensures all cylinders fire after 720 degrees crank rotation, something which doesn't occur with an even number of cylinders. Also, the use of master and slave cranks means the cylinders can remain in a single plane on a short, rigid, single-throw crankshaft. A multi-lobe cam ring rotating at half crank speed around the crankshaft operates the pushrods actuating the valves. It's worth noting, radial engines generally make use of a central intake, a pressure carburettor and a supercharger for high-altitude operation in aircraft.

What is the true performance potential of a radial engine?

Put it this way, by the time of the Second World War, radials had grown to the likes of the Pratt & Whitney R-2800 Double Wasp, a twin-row, eighteen-cylinder (two rows of nine), forty-three litre monster developing more than 2,000bhp.

How many land vehicles are powered by a radial design?

Radial engines are rarely used away from the aircraft industry, though there have been several radial-powered tanks. Porsche also has history with radial engines — Ferdinand Porsche experimented with three-cylinder and five-cylinder radials for the Porsche Type 12, an early step in the development of the original Volkswagen. Designed in 1931 and prototyped a year later on the instruction of German motorcycle manufacturer, Zündapp, all three Type 12s built were destroyed during the war, the last example falling victim to a bombing raid in Stuttgart during the final stages of the conflict.

How did you and your team identify the need for a radial engine in current automotive applications?

I'm a mechanical engineer by trade. I've been working on a two-cylinder air-cooled aircraft engine since before the turn of the century — an extracurricular activity for an aircraft design I've also been developing. I purchased a set of ninety-four-millimetre Type 1 pistons and pots for my first prototype engine, simply because Volkswagen and Porsche parts are unrivalled in the field of air-cooled engine design. In 2014, I founded Bespoke Engineering and began to model the engine with my colleagues, Andy Wirth and Scott Pearce, the latter being a highly talented designer who ensures our engines are as beautiful as they are functional. We quickly realised two cylinders wouldn't produce the power we wanted, leading us to consider the possibility of developing the idea into a three-cylinder radial design.

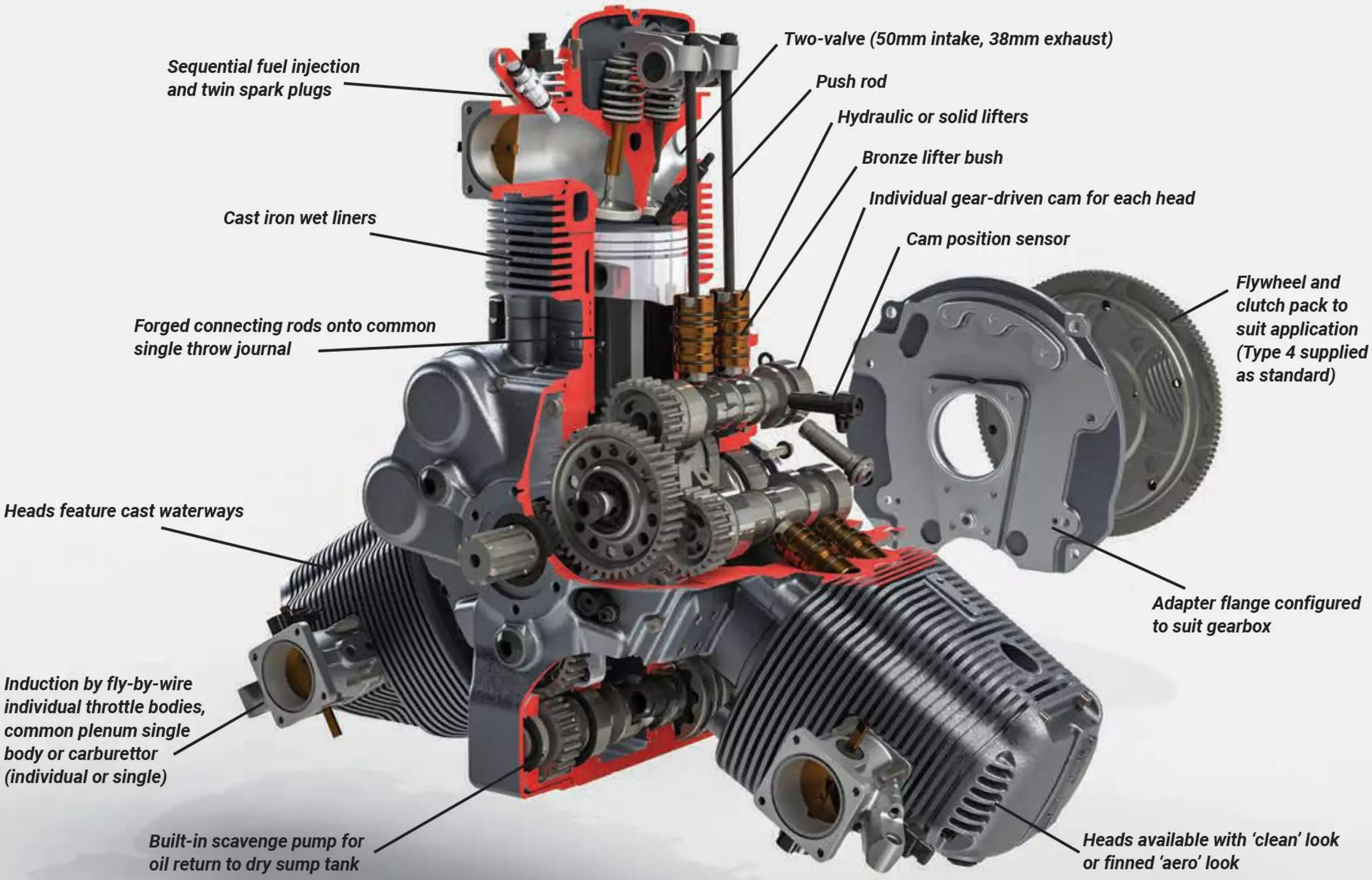
Whilst gathering Type 1 engine parts, I met Aaron Britcher, a well-known character in the air-cooled enthusiast scene in Adelaide. We had a very funny conversation — I told him I was looking for Type 1 connecting rods, but explained I only need three. He laughed and told me I really didn't know very much about engines. I fessed up and revealed what the intended application was, at which point, his eyes lit up. "Why don't you make your design bolt up to the Volkswagen transaxle?" he asked. I immediately saw the possibility of this engine appealing to owners of rear-engined, air-cooled Volkswagen and Porsches.

Armed with the potential for a whole new audience for your work, what was the next stage of development?

By now, we'd labelled the project Radial Motion, essentially the name for Bespoke Engineering's engine design and development division, as well as our public brand. I recognised the need for cast components and, while visiting Harrop Casting Technology, Australia's top non-ferrous foundry, I met the company's owner, Loui Burke. He quickly saw the potential in Radial Motion and decided to invest in this exciting project, as well as in Bespoke Engineering. With solid funding behind us, it was time to get serious with engine development — we set to work full-time, closing our doors to all third-party client commissions.

Who else has played a pivotal role in establishing Radial Motion?

The next member of the team was Yorkshireman, Chris Marshall, who brought a lifetime of motorsport engine experience, most recently with Neil Brown Engineering,



a Lincolnshire-based company specialising in the build of competition engines.

Following Chris' arrival, four years and more than $3million Australian dollars have been in invested in our radial engine development programme, including building the infrastructure to manage and support engine production. Our target is to produce a thousand engines per year within five years.

What would you say is the philosophy behind a Radial Motion engine?

This has always been an engine designed by engineers for people who *love* engines. It's not technology determined by accountants to be disposable after 200,000 kilometres. It's a celebration of all things magical about the internal combustion engine (ICE), in an age where it seems to be under attack from all sides.

We feel we could be writing one of the last chapters in the story of the ICE and hear the voices of engineers past with their slide rules, manual machines and longhand calculations. With all the modern resources we have at our disposal (solid modelling CAD, FEA and five-axis machining, for example), we consider ourselves duty bound to come up with something amazing. We stand on the shoulders of these giants.

Ultimately, we set out to design an engine which can be easily and joyously maintained by the end user. It's a radial engine you can strap yourself to on the ground, in the air or on the water and go out and dance with the machine. It's a beautiful design and sounds magnificent. It's light, powerful, and you can see how it works simply by looking at it. We can't wait for more people to experience the engine from the driving seat. Of course, they'll be pleased to know this engine promotes low-maintenance and therefore low-cost operation.

What is the basic configuration of the Radial Motion engine?

From the beginning, we decided to configure the engine around commonly available parts to ensure it could be maintained at low cost indefinitely and leverage off the back of existing supply chains. I firmly believe true sustainability is the ability to repair and maintain a machine indefinitely, where all the wear parts are easily sourced and replaceable. As mentioned earlier, our first prototype engine was air-cooled and used Type 1 twin-port heads, cut in half with a new end machined and welded on. The pots and pistons were aftermarket Volkswagen parts paired with Chevrolet connecting rods. The crankshaft was a three-piece item and the case was machined from billet aluminium.

The three rods are connected to a common single-throw crank journal. It's a two-valve pushrod engine with a separate camshaft for each head, driven by gears of the crankshaft front. This 1,600cc engine ran well and proved the configuration worked. The next evolution in the design features billet heads with larger valves and water-cooling galleries.

Why the switch to liquid cooling?

Put simply, we did it for power and good looks. We could see the emerging beauty of the engine — even as a prototype — and it seemed a shame to cover it up with tinware. With water cooling, we could also shamelessly pursue power. It was here the engine changed from being a variation of a Type 1 engine and further developed its own personality.

We've arrive at Radial Motion's production engine.

The prototype engine used a mix of parts. For production, we have adopted General Motors LS-series

Above Radial Motion engine features integrated oil filter and pressure relief, crossflow heads and 12mm head studs

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The cylinder bore of the production engine is 99mm with an 86.5mm stroke, resulting in 1,998cc displacement. The intake is 51.3mm, with 39.4mm exhaust, a hemispherical head and bold crossflow ports. The majority of the components are cast, including the heads, which retain use of cast-in waterways. The pipework, meanwhile, is clean and minimal. Water and oil, including pressure and scavenge, is piped internally using drillings.

What are the challenges of using a radial engine in a car. And how can they be solved?

For a start, to be a straight swap for a Volkswagen or Porsche air-cooled boxer, the bottom of the radial engine can be no lower than the existing sump. Use of a common journal (three connecting rods on a single crank) in a 'compact radial' configuration brought the engine diameter down to a minimum, whilst keeping the rod-to-cylinder bore angle acceptable. The engine is oversquare, whilst still exhibiting excellent torque.

You'll note the pushrod on the top cylinder is on the right-hand side. The head of cylinder two (positioned at four o'clock) is reversed so the pushrod is on the high side, otherwise it would 'hang down'. Also, with no room for a sump, the engine has to be dry sump. For this, we have manufactured a custom cartridge of oil pumps which fit under the engine. The rear set is the pressure pump. There's a separate pump for each of the lower two heads and the case bottom. For aerobatic aircraft applications (running upside-down) there will be an additional oil pump for the upper cylinder. The oil pumps use Subaru standard gerotors. Scavenge oil is returned via an oil cooler to an external dry sump tank. The use of these scavenge pumps (and non-return valves in the oil lines) ensures a dry case and good case vacuum. whilst eliminating the scourge of hydraulic lock affecting most radial engines — hydraulic lock is where the lower cylinders fill with oil and, when the engine is started, the incompressible oil locks the cylinders, which sometimes bend the connecting rods, or at least creates clouds of smoke when the engine is fired-up.

What aspects of the Radial Motion engine have surprised you?

The engine is *very* smooth running. A coin will balance on edge during idle, no problem. This engine spins up really quickly, too — before you know it, you've reached the rev limiter. I'm also pleased at how easy it is to work on the engine, a benefit of its one-piece case. Removing the front cover allows you to inspect all gears and look deep into the unit. Importantly, the camshafts can be

Above The Radial Motion engine sits no lower than the bottom of the original sump

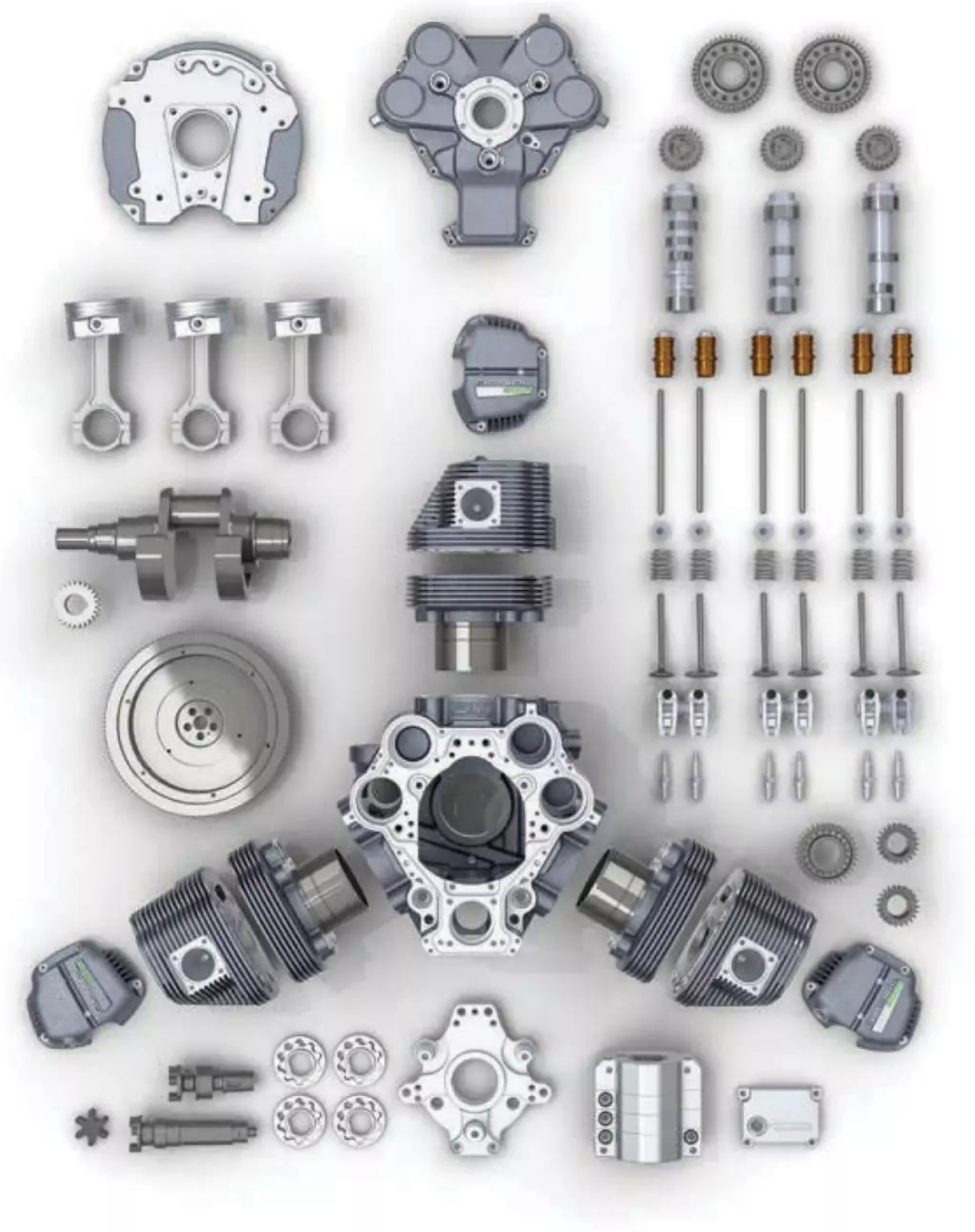
Left The bare three-cylinder Radial Motion engine — a six-cylinder version is in progress and will be aimed at enthusiastic 911 owners

swapped the need for stripdown. Of course, we will be selling each engine as fully operational and tested, but we're also offering it as a kit for experienced builders to assemble across a weekend. We're particularly excited about this option. For us, it's all about a user being familiar with the engine powering their vehicle, rather than having to scan forums and reference books in order to understand the nuts and bolts of OEM technology. With Radial Motion's offering, owners and enthusiasts can have a brand-new aftermarket engine, not a rebuild based on an OEM unit and featuring a mixture of parts.

Tell us about the exhaust.

The three separate cylinders present a piping challenge for exhaust, which is on the firewall side — the top cylinder is the furthest one 'out', with each cylinder offset by one conrod thickness. We've run three single hotdogs (fun, but annoys the neighbours) and curled equal length runners (messy, but pleases the perfectionists). Our preferred configuration is three unequal length runners to a collector. There's a slight reduction in performance, but the exhaust note created is unique and sweet. In fact, the note confuses many who hear it — some think a V8 is approaching, others think a Ducati has been merged with a Harley-Davidson!

Due to a power stroke every 240 degrees (with no power overlap, unlike a four-cylinder engine) and because of the odd cylinder count, the exhaust tone is unique. As far as volume is concerned, we can hold a note capable of not disturbing a sleeping baby, all the way to an immense roar capable of breaking windows.



Below A single-piece cast case with integral water and oil channels

What about induction?

Ordinarily, the engine uses sequential fuel injection by way of Bosch injectors driven by a MoTeC ECU and twin-spark ignition using LS1 coilpacks. We've also used a common plenum with a single throttle body, as well as three individual throttle bodies, as per Ron Goodman's 356. The intake roar, with the flat-cut gears whining in the background, is nothing short of amazing. The one-piece case, complete with twelve-millimetre head studs and ARP nuts (using old-school copper gaskets with wires) is super-strong. With this in mind, our next step is to see how much boost the engine will take with forced induction (trialling turbocharging, as well as supercharging) as we head toward output of more than 200bhp. We used three separate carburettors on each cylinder for a radial-powered Bon Trike, which was simple and worked well. A single-carburettor unit is planned, in each case with a single intake getting an even mixture to each cylinder. Incidentally, the single-carburettor design will make for a simpler swap because there is no need for high-pressure fuel.

You spoke about cooling. Tell us more.

In our open-topped Zombug project, we installed a radiator where the rear seat was, encouraging that Baha bug look. For the 356, there's a radiator tucked inside the front wheel arch, while our Kombi build features a radiator and scoop under the belly. The engine is available with a clean (non-finned head and barrel) look, as well as a finned aero look. Of course, finning makes a significant contribution to cooling, but the engine uses an electric water pump thematically controlled from exit water temperature. We're experimenting with using oil as the sole cooling medium — a move designed to eliminate the water system — thereby simplifying the install further. By our reckoning, buyers will only need to make use of a larger oil cooler, which helps with packaging and simplifies the set-up.

Ah, yes. Packaging and installation. This is something of great interest to our readers, many of which own small, rear-engined Porsches.

The Radial Motion engine includes a separate rear flange plate, which we can configure to any gearbox. As standard, it's a straight fit to Type 1 transaxles. The standard flywheel is a five-bolt Type 4 part, but we can fit a flywheel and clutch to suit any application. It's important to note, presently, if swapping out an air-cooled engine, you'll need a dry sump oil tan and a high-pressure fuel pump, which can be fitted into a standard fuel tank. Naturally, we can supply a kit and talk users through each step of installation. Communication is key — whilst we will have sales and distribution representatives worldwide, and though these engines and spares will be available in most countries, we wish to maintain a direct relationship with every Radial Motion customer. Put simply, each install is different. It is therefore important for us to be available to offer advice based on our wealth of experience. It's also crucial for us to gain feedback relating to what customers do and don't like about our products. Most importantly, it's about

having fun and sharing a common passion for bespoke engineering, hence our company name.

Let's talk real-world performance. What output can we expect from a Radial Motion engine?

To make a great race engine, you need to start with a strong and reliable base engine. Extensive testing on the road and with our in-house 1,000bhp water-brake dyno has proven this. Our first ten engines use stock LS grinds, meaning they're very driveable, but very torquey (at 112 degree lobe separation). With a standard Super Bug gearbox, we campaigned the Zombug on the recent Adelaide rally. First and second gears were too short, which is why we kept the engine in third and powered our way around the Adelaide Hills, mostly sideways. I guess this Beetle-based build thought it was a 911?!

We are working closely with Kelford Cams in New Zealand to realise a variety of power figures. In 'daily driver' specification, which, frankly, is a handful for a Beetle (or capable of towing a caravan with your Kombi), you can expect 120bhp at 5,500rpm. Our street performance package delivers 170bhp at 6,500rpm, while our race performance configuration will realise 215bhp at 8,500rpm. A planned normally aspirated Extreme variant will deliver 240bhp at 10,000rpm, while our Turbo Sport package (featuring a turbocharger or supercharger) will knock your socks off with 260bhp at 8,500rpm.

As we venture past 8,500rpm, we upgrade engine internals. Specifically, we make use of PAC Racing springs, titanium valves, Compstar connecting rods, SRP forged pistons, Yella Terra rockers, solid lifts, chromoly pushrods, Mahle bearings and Bosch motorsport sensors. The crankshaft is tough 4340 billet, deep nitride, shot-peened and cryogenically treated.

Exciting stuff!

Yes, but we're not done there. We're developing a diesel-fed version of the engine as a hybrid power range extender for electric vehicles. The first instance of this is scheduled for installation in a ten-tonne military truck. And, following completion of the aforementioned performance versions of the three-cylinder radial, we'll be developing a six-cylinder engine taking the form of two rows of three cylinders. Offering up to 400bhp, this will be an exciting option aimed at owners of Outlaw-style classic 911 restomods.

Will the hybrid unit be suitable for Porsche applications?

The short, round radial engine marries perfectly with an axial flux electric motor as a parallel hybrid with a straight bolt-up to the gearboxes of air-cooled Volkswagen and Porsche cars. This opens up a number of exciting possibilities. Imagine a hybrid Kombi, for instance. You could you move about town on the 40kW electric motor, be able to drive into the increasingly ICE-free areas of cities, such as London and Paris, yet be able to take long trips into the country with the 80kW ICE. For us, this is true sustainability — the ability to keep these classic vehicles on the road by way of a modern engine meeting current emissions regulations, coupled with an electric motor for commuting.

Now imagine a hybrid 911, with a 100kW axial flux motor married to a 125kW ICE. You can sneak about town on the axial flux, take advantage of the crazy acceleration electric motors provide and, once out on the open road or on the track, hit the 'stupid' button coupling near 250kW with brutal electric acceleration and the wild roar of the radial. This is all possible right now, with only a few hundred kilograms of batteries. Radial Motion hybrids will be ready for the road before long. We're looking for early adopters. Interested readers shouldn't hesitate to get in touch with the Bespoke Engineering team. Our contact details can be found at our website (*bespokeengineering.com*).

What's the cost?

The base price is a very reasonable $25,000 US dollars. I recognise this is more than the rebuild of a Type 1, but it's far less than rebuilding a Porsche boxer and, of course, you're getting a brand-new engine capable of setting land speed records. To prove the point, Kennedy Motorcycles in Adelaide is fitting a Radial Motion engine to one of its performance bikes in an attempt to exceed 200mph on the salt at Lake Gairdner in Southern Australia. Quite the spectacle.

Thanks for your time, Nick. It's appreciated. ✪



Below Radial Motion engine valvetrain exposed

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FAVOURITE TIPPLE

Air-cooled Porsche restoration specialist, Mike Champion, was so fascinated by the Jägermeister liveried 934 and Carrera RSRs prominent in the 1970s and 1980s, he created his own version in the form of this road-legal RSR replica...

Words **Johnny Tipler** Photography **Dan Sherwood**

Jägermeister. There's a certain ring to it. There's also the brand's Germanic script and famous stag logo. As for the colour, who doesn't love an orange 911? Tasty! It appealed so much to independent marque specialist, Mike Champion, he created the very Carrera RSR 3.0 replica you see on these pages.

Mike owns MCE Porsche, an everything-under-one-roof shop specialising in classic Porsche restoration. He campaigned the car in the inaugural Porsche Club Motorsport 911 Challenge and has since rebuilt the engine. Unlike the majority of other 911s competing, however, this one travels to circuits and back under its own power — Mike has built a road-legal RSR. Incongruous? He finds driving the car to tracks more convenient than pulling it on a trailer.

RSR. We're talking about big-time race cars. Back in the day, the Carrera RSR 3.0 was Porsche's pragmatic response to shifting FIA regulations. Indeed, in 1973, the first turbocharged Carrera RSRs were quick enough to rival the Matra, Mirage and Ferrari prototypes for outright wins, as happened in the 1973 Targa Florio. In 1974, the normally aspirated Carrera RSR 3.0 basked in the reflected glory of the works RSR Turbos and formed the bedrock of the European GT Championship for the next two seasons. With sights set on 1975, when the World Championship for Makes would be formulated for production-based race cars, Porsche concentrated on developing the turbocharged 934 and 935 for Group 5, while customer teams flew the flag in Groups 3, 4 and IMSA categories, fielding the Carrera RSR 3.0. Although dominant in the European GT series, the model was by no means a high-volume production Porsche — the Weissach competitions department built just 109 units in both Carrera RS (road trim) and Carrera RSR (race trim), split between fifty-six road-going models and fifty-three race cars.

The first fifteen Carrera RSR 3.0s were despatched to North America for the International Race of Champions (IROC) series, starring leading drivers from Indycar, NASCAR, TransAm, Can-Am and Formula One. Invited aces raced identically prepared 911s. Interestingly, the IROC RSRs were the first racing Porsches to flaunt then new impact-bumper styling. In this respect, the RSR 3.0 was a quantum leap from the preceding RS 2.7, complete with its mild wheel arch flares and ducktail spoiler. The Carrera RSR 3.0's pumped-up bodyshell was typified by bulging quarters, lighter-gauge steel, thinner glass and minimal sound-deadening, plus a new front bonnet and engine lid, from which sprouted a horizontal wing, known as a 'whale tail'. The coherently integrated front airdam and valance was different from the series production cars, with its frontal opening for the oil cooler and paired brake cooling ducts on either side. Two types of whale tail were available: a smaller version equipped with protective rubber lip for road use, and for racing, the bigger IROC-style wing with its additional cooling vent, extending beyond the rear of the car's bodywork.

THE RSR 3.0'S PUMPED-UP BODYSHELL WAS TYPIFIED BY BULGING QUARTERS, LIGHTER-GAUGE STEEL, THINNER GLASS AND MINIMAL SOUND-DEADENING

Compared to the flat-six powering the earlier Carrera RSR 2.8, the three-litre boxer featured a larger bore and a more forgiving aluminium crankcase than the magnesium componentry on the smaller displacement unit. The three-litre engine was also equipped with twin-plug ignition, reprofiled camshafts and made use of 10:3.1 compression ratio, contributing to power output of near 330bhp at 8,000rpm and close to 232lb-ft torque at 6,500rpm. While you'd be right to think enhanced power was a major plus point on the track, the biggest benefit to come from the new specification was improved reliability. Nevertheless, with weight tipping scales at just nine hundred kilos, the Carrera RSR 3.0 was capable of hitting top speed just shy of 180mph.

The brakes were sourced from the 917, as were the RSR 3.0's superb centre-lock wheels, measuring ten and a half inches of girth at the front, fourteen at the back. Helping to keep weight to a minimum, the cabin was stripped of all but the bare essentials, the windows were made from polycarbonate and fibreglass was used to construct the bumpers, engine lid and frunk. Exaggerated rear wheel arches accommodated intake apertures to cool the powerful anchors, which sat ahead of coil springs, adopted in place of the traditional torsion bar arrangement. Having said all this, it's important to remember the Carrera RSR 3.0 was built around a standard production 911 shell, a requirement for homologation purposes.

BEST OF BREED

Mike is in good company — when I interview racing drivers, I usually ask them what their favourite Porsche race car is, and, almost without exception, the answer is the Carrera RSR 3.0. Derek Bell told me how this 911 felt compared with its successors, the turbocharged 934 and 935. "In 1976, I raced a 934 and an RSR for the same team, Max Moritz Racing, and in the same event at the Nürburgring. It was exciting because I got out of one 911 and hopped into the other. I was happy enough in the 934, which was turbocharged, but the normally aspirated

Facing page Mike established MCE Porsche after time served working on engineering projects for major sports car manufacturers, including Aston Martin and Jaguar



Group 5 RSR proved much more fun to drive — the 934 was such a handful when all the power came in, even with those massive wheels and tyres at the back."

And what about Mike's zesty RSR replica? He took it under his wing as an unfinished project. "It had been raced in Europe. The then owner, a keen classic car race enthusiast, started the conversion to RSR spec. Soon after, other projects took priority. He'd taken care of the majority of the bodywork and he'd swapped the old RS magnesium case engine to an aluminium unit, following up with a season of racing. The engine was tired, but it was running, meaning I could wheel the car around my workshop." The chassis hadn't been modified to RSR specification, although a Heigl roll cage and a fifty-litre racing fuel tank were in place.

The car was originally an impact-bumper 911 from 1976, galvanised, though Mike reckons there's nothing factory-original left, other than the shell. His target was to race in 2021's 911 Challenge. Porsche Club Motorsport had just launched the series and were scouting for willing participants in charge of air-cooled 911s. All standard cars from 1965 to 1989 were eligible to compete, although to satisfy demand from owners of later air-cooled cars, an open class for 964s, as well as heavily modified 911s, was introduced. "The club's vision was to reprise the era of classic 911 racing and get air-cooled cars back on the grid," Mike muses. "I thought, okay, I'll go for it, because it's surprisingly difficult to find a series to properly race these cars against one another. Then it was a case of building a 911 to compete in around other workshop commitments. I did so across weekends and evenings, finding slots in the workshop during 2020 to get the car ready for the series' inaugural season."

THERE WERE NO PODIUMS NOR HIGH PLACINGS, MAINLY BECAUSE HE FOUND HIMSELF UP AGAINST RS-BADGED 964s

During this period, Mike performed the chassis build, including installing a new wiring harness feeding working lights, a rational ignition system, indicators and wipers, all to ensure the car could be road-legal. "I know what an RSR needs to be capable of, which is why there was also a lot of work regarding suspension geometry," he continues. "The wheel offsets on an RSR are specific, the wheel sizes are different and need to be compliant with tyre regulations." A bigger brake package was required, as well as 935-specification front suspension, which provided full flexibility and provision for adjustment of camber, offset, kingpin angle and tracking.

Due to the fact the car needed to be FIA-compliant, the only changes Mike could make at the rear are in accordance with RSRs in period. "The rear arms had to be short versions in steel at the revised mounting points, thereby giving the car the proper rear suspension arc and travel for a lower driveline height, as well as the agreeable rear camber control RSR geometry gives you." He had to update the fuel system, because the aforementioned fifty-litre tank was nowhere near big enough for the 911 Challenge's hour-long races. "I also installed a Lifeline fire safety system, ignition cut-off switches, an AZ Instruments digital data-logging system, rear window straps, Cobra Monaco Pro bucket seats, OMP safety harnesses and a WEVO shift mechanism. That's pretty much how I raced the car, with no changes to the engine, a result of simply running out of time before the season started. That said, I was keen to see how the engine was behaving and to get a feel for the car's balance. Effectively, it was a shakedown across a couple of races, without having to go in for a full engine build."

After an absence from racing of around ten years,

Above Mike's RSR replica was a labour of love worked on at his base near Banbury in the run up to the inaugural season of Porsche Club Great Britain's 911 Challenge series

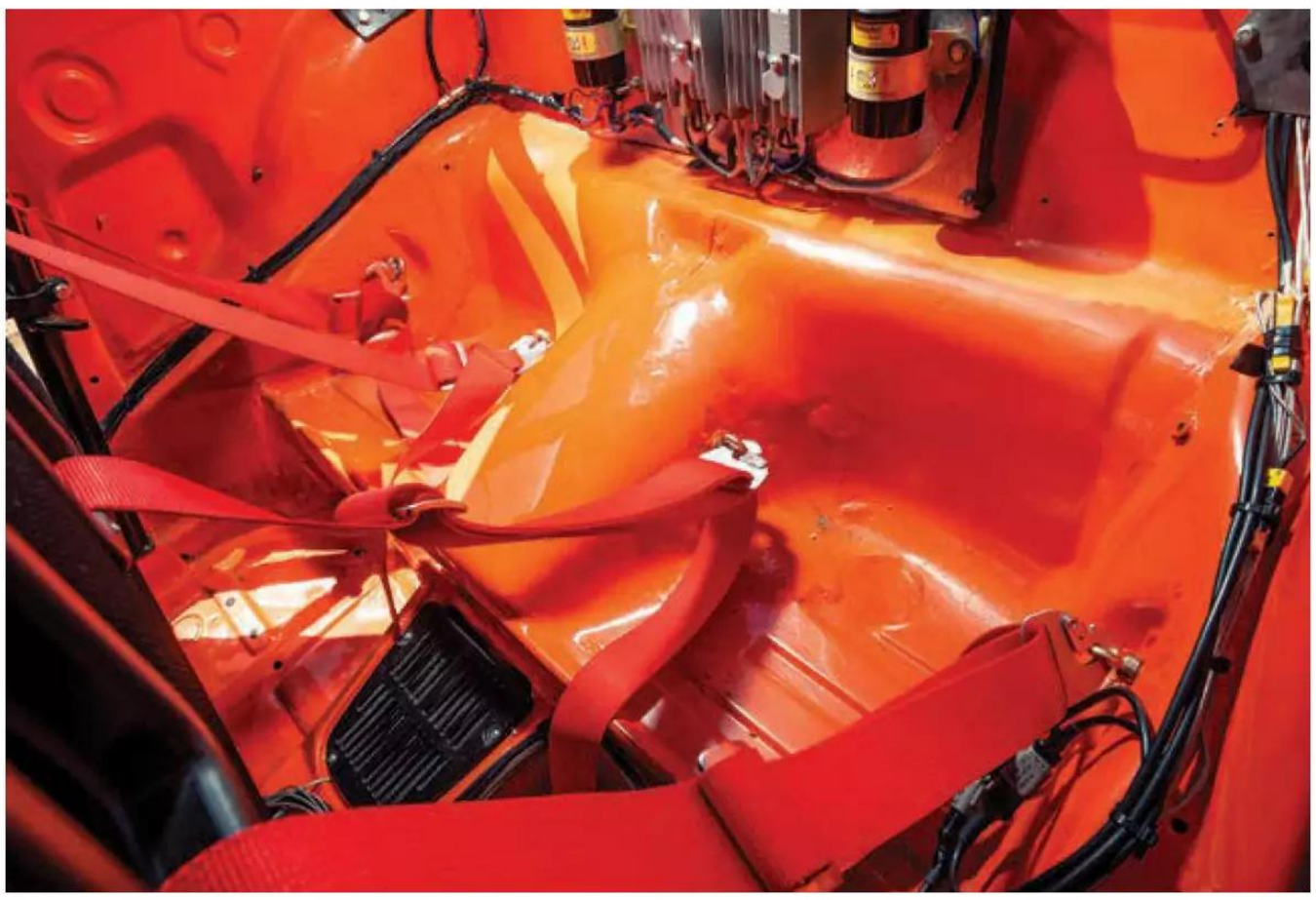




Above and below Cabin is a functional race car office, yet this 911 remains road legal following its transformation from a stock 1976 G-series

Mike was happy enough just to be in the mix. There were no podiums nor high placings, mainly because he found himself up against RS-badged 964s. “We’re talking twenty years of advances in technology over my car,” he laughs, “and in the open class, there were no FIA constraints. I was up against 3.8-litre 911s running more advanced chassis. These cars could get around corners much quicker and could accelerate faster. I was never going to get a good placing against them. Then again, I wasn’t going to start throwing money at the car to make it competitive against 964s, or even the modified SCs competing, because this would mean risking my 911 no longer being FIA compliant, a hard sticking point as far I was concerned. I was building an RSR replica because I wanted to get RSR racing experience. This meant sticking with the technology of the day, as it was in period, as well as sticking with FIA regulations.”

Due to the fact the car is road-legal, Mike could drive it to and from race circuits, as I did with my Alfa Romeo GTV6 when I ran in the AROC series in 1989 and 1990. “It did depend on where the track was,” he reveals. “I trailered it to tracks far afield, simply because the car consumes quite a lot of fuel. It doesn’t make sense to spend two or three hours driving this 911 up to, say, Snetterton from my base near Banbury, especially when I’ve got a stack of tools and other gear to carry. When I raced at Silverstone, which is literally fifteen minutes up the road from home, I drove this 911 to the circuit and back again. Besides, when you’re conducting drivability calibration and chassis build, it’s useful to be able to take the car onto the road for testing.” It’s the same with dyno sessions. “There are a couple of rolling roads I use within a fifteen-minute drive of home. It’s so much easier to drive the car to the site and strap it down, rather than faff around with a van and towing trailer.”



SKIN IN THE GAME

Mike knows a thing or two about engine building and tuning. MCE (Mike Champion Engineering, in case you hadn’t already guessed) was established in 2012, following many years he spent working for some of the most respected names in the automotive world. “I left school and began an apprenticeship learning car bodywork repair and paint,” he tells us. “I then moved onto fabrication and welding, developing my practical skills, but even as a young child, I was fascinated by how things work, the technology behind them and what challenges their creators faced during the development process. This curiosity continued with me through my formative years and into adulthood, leading me to embark on a four-year degree in automotive engineering.”

An invitation to join Tom Walkinshaw Racing (TWR) followed. Founded in 1976 by racing driver, Tom Walkinshaw, TWR took on the factory touring car programmes for Mazda and Rover, but is most famous for its work with Jaguar, beating Porsche to the 1988 World Sportscar Championship constructors and drivers titles with the XJR-9. Dressed in the now iconic purple Silk Cut livery, the seven-litre, V12-propelled sports-prototype took the win at the 1988 24 Hours of Le Mans (the fifth round of the championship), marking the first



Above Engine output is a potent 330bhp, matching original RSR 3.0 power

time since 1980 Porsche hadn't secured overall top honours at Circuit de la Sarthe. Jaguar and TWR would win the daylong French endurance race again in 1990. It would be 1994 before a Porsche repeated the feat of taking first-place overall. "Tom was trying to promote TWR as a rival for Porsche's motorsport and engineering departments," Mike recalls. "We offered a huge amount of engineering expertise to world-renowned car brands, including Jaguar, but also Nissan, which commissioned TWR to take care of suspension work. SAAB was also a client, seeking assistance for further development of its range of turbocharged engines. Additionally, TWR developed and built the legendary mid-engined Renault Clio V6 Sport," he adds, before revealing an interesting truth. "Porsche was always the benchmark, always the point of reference. We'd constantly be looking at how the German company's engineers were doing things. The 911 was held up as a prime example of engineering excellence, something to aspire to and a source of real inspiration. I remember thinking to myself, if 911s are so good, why aren't I working on them?!"

Purchase of a 993 gave him a taste of things to come, but a series of important jobs at major automotive brands preceded the forming of his own Porsche business. "After my time at TWR, I spent three years working on engine development at Jaguar, before joining Cosworth, where I stayed for seven years, managing race engine programmes for industry clients, including Aston Martin, and developing variable valve timing concepts." He was then invited to work for the Gaydon concern directly, before being pulled back to Jaguar to oversee complex chassis and suspension design projects, as well as complete vehicle testing. "I enjoyed all of these jobs, but I was unable to shake the desire to work on Porsches. When an opportunity to buy and resurrect a pair of derelict smithy buildings in Motorsport Valley presented itself, I saw potential for a new home, as well as the opportunity to build a workshop enabling me to realise my dream of establishing a business conducting classic Porsche works, from minor servicing to full restoration, all of it exclusively for rear-engined models."

THE CAR ROLLS ON BBS SPLIT RIMS, BUILT TO MIKE'S OWN SPECIFICATION TO ENSURE THE OFFSET HE WANTED

Correctly configuring an RSR's suspension is crucial. To this end, Mike's car makes use of modified Bilstein dampers, altered because RSR suspension geometry demands modifications to the spindle and steering arm to be able to dial out bump steer. Wheel choice is interesting — the car rolls on custom-made BBS split rims built to Mike's own specification to ensure offset accommodating many different tyre options. "I've got enough capability to dial-in suspension settings good for a generic track setting," he tells us. "There's a degree of adjustment for a right-handed twisty circuit or an oval with long straights. You've also got diversification with different levels of fuel load, which varies during the length of a race. I was able to find a good track-biased setting I knew was going to be ideal for ninety-five percent of the tracks this car was ever going to be on, with a broad range of fuel loads, along with the known tyre specifications and the current engine capability."

911 Challenge didn't specify a control tyre, only that whatever rubber used needed to be a road tyre. The MSA rule book has an official list of approved road rubber.









Above Wheels were manufactured specifically for this 911, ensuring availability of a wide range of tyres

Below Not what you'd expect to appear in your car's rear-view mirror when nipping out to the shops

The Classic Sports Car Club (CSCC) uses it as its bible for allowable treaded tyres, which are non-slicks or non-Cup slicks. Most teams are running Toyos. "That's fine if you're on a standard 911 chassis," Mike reasons, "but the RSR addresses the balance issues of the 911 by putting tonnes of tread on the rear, a very old-school way of balancing traction capability, front to rear, based on weight distribution." There isn't a road tyre with suitable track width an RSR is happy with, though. "Race tyres are brilliant, because you can specify massive depth fitting a fifteen- or sixteen-inch rim, but as soon as you go to road tyres, you're fairly constrained. And, of course, when your tyre choice is constrained, grip is constrained. Your chassis set-up therefore must be compatible with all of this, which is why I tuned my 911's chassis for circuit racing with a road-biased tyre, even though it's not the ideal choice for an RSR."

To really exploit an RSR, you should put racing slicks on it, get the rear tyre section as wide as possible and utilise the full power and turn-in capability of the car as it was originally engineered. Mike can always change the race series he participates in, of course — he's in charge of an FIA-homologated 911 eligible for national and international historic events run by the HSCC, Peter Auto and Roadbook. These events include Le Mans Classic, Nürburgring Old Timer and Spa Six Hours. "That's where this kind of 911 is happiest," he says. "It's also taking a long-term view about my intention for the car, to make it capable of taking part in international competition at FIA level, allowing it to race as RSRs did in period."

It was time to bite the bullet and get serious with the flat-six. "It was clear that if I really wanted to get competitive and get toward the front of the grid, then I was going to have to pull the engine and do a proper rebuild. This was my task after racing at Silverstone. It took me through to the following May to strip the unit, inspect it, re-specify the necessary parts, re-engineer and rebuild, including a conversion to slide throttles, an MCE custom-designed camshaft and valving, porting and exhaust changes to achieve power output of 330bhp, matching the original RSRs in period. I'm constrained by three litres, effectively meaning the criteria for increased performance couldn't come from displacement. It had to come from revs. As soon as you define as much, you know you're going to need a lightweight valvetrain and other hardware changes to achieve target power."

The original Jägermeister Carrera RSR 3.0 (carrying racing number fifty-four as per Mike's car) was driven by Eckhard Schimpf. Between 1974 and 1977, Schimpf drove his RSR in selected 500km Championship rounds, plus domestic DARM races in Germany, sometimes solo, sometimes with co-drivers, most notably in 1976 at the Silverstone Six Hours, with superstars Jürgen Barth and Reinhold Jöst at his side. As for Jägermeister, the drinks brand sponsored several teams in period, including Kremer Racing and Max Moritz. Jägermeister Racing was, in fact, run by Schimpf himself, who in 2016, along with his son, Oliver, organised a reunion of the iconic orange race cars, including the very Carrera RSR 3.0 he





raced in eighty-four different events, notching up thirty-nine wins in the process.

Schimpf was sponsored by his cousin, Günter Mast, who was CEO of Jägermeister. Having started in 1972 with a 914/6, Schimpf progressed from running the Carrera RSR 3.0 to driving a 934, 935, 956 and 962, with several BMW 3.0 CSL Batmobiles also in the mix. I recall a conversation I had with Erwin Kremer a few years ago. "We were with Jägermeister for seven years," he recalled. "No sponsor gives that degree of commitment anymore. It's a two-way thing, though — the team must give equal commitment to the sponsor. Unfortunately, you can't do this in the short term. You have to build up to it."

I've driven three Carrera RSR 3.0s over the years, and if Mike's car is anything like them, he's having an awesome time behind the wheel. I particularly enjoyed having a go in an RSR in circuit mode, sling-shotting me up the start-finish straight, twitching and writhing at the slightest hump, the car's nose sniffing out every nuance of the serpentine track. The RSR's rock-hard suspension takes no prisoners on anything but billiard-table blacktop. Steering was light, requiring a deft touch (rather than a commanding yank), while lock was very good, considering tyre width. Turn-in was fantastic, and I could place the car instinctively where I wanted it, surging out of corners in a burst of glorious six-pot excess. Acceleration was also phenomenally vigorous, from 2,000rpm right around the rev counter to 8,000rpm. Hardly daring to glance at the clocks in my full-on circuit scenario, I glimpsed 100mph at 7,500rpm in fourth gear.

There was plenty of torque at the other end of the scale, making rolling starts viable in second gear. The clutch was so positive, that even on dry asphalt, the wheels would spin easily. The gear lever felt metallically precise as I moved it through the gate, yet selection required care in order to avoid graunching. The brakes also required positive treatment, being sourced from the 917, and needing the pedal to be firmly stood on to achieve any effect at all. The car was running on wide-rim nine-inch and eleven-inch Fuchs wheels, which complemented the audacious stance. The RSR was light on its feet, making it easy to forget how wide the rear track was and encouraging me to ride the kerbs. Breathless and sweating profusely after a half-dozen laps, I motored onto the paddock access road and sat with the engine ticking over for a while as I savoured the experience. As for Mike's RSR replica, the engine is back in and he's ready to make his return to the track. "I want to try and get on the tail end of this season, just to have a few shakedown races and learn what the engine is really capable of. It's all very well popping it on a dyno, but you need to see how it's behaving with sustained high-speed shifting, spending twenty-five minutes going between 6,500rpm and 8,500rpm, which you can't really replicate anywhere other than on a circuit." He'd likely be up against drivers in TVRs, Alfas and Cosworth-powered Fords. Not quite the hardcore opposition faced by the Carrera RSR 3.0 in its halcyon days, but the context is different, and we're way beyond that now. Ultimately, Mike and his glorious 911 should have the pace to win. The car will be put up for sale thereafter. He's certainly cracked the imagery. Hopefully, we'll be raising a glass come season end. ✪

THE ORIGINAL JÄGERMEISTER CARRERA RSR 3.0 CARRYING RACING NUMBER FIFTY-FOUR WAS DRIVEN BY ECKHARD SCHIMPF

Above The car was part-converted to RSR specification during previous ownership, spent a season racing in RS trim and is now for sale following impressive showings at various race circuits in RSR 3.0 guise

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Photo: Dan Sherwood



TARGA SAGA

It's one of the most amazing backdates to grace our pages in recent times, but you'd be hard-pressed to guess this eye-popping 911 started life as a 964 Carrera 4 Targa...

Words **Johnny Tipler** Photography **Gunhill Studios**

On the face of it, there are plenty of reasons not to meddle with a 964. Sure, time was, they lingered in the desirability doldrums. Back then, everyone wanted a long-bonnet classic. Now, though, this generation of 911 is highly sought after. Values have skyrocketed accordingly. I thought I was doing well getting twice what I paid for my 964 when I sold the car in 2016, but I weep when I see what a Porsche of its calibre is worth today.

Generally speaking, buyers want 911s in standard specification. With values as they are, why would you compromise originality by altering a 964 and turning it into a full-blown backdate? Granted, Rob Dickinson would no doubt give you a decent price for your standard 964 in order for it to be transformed into one of Singer Vehicle Design's next showpieces, but going for a song? I don't think so.

IT RETAINS ITS TARGA TOP AND THE OVERALL RETRO LOOK WORKS WELL WHEN, IN TRUTH, IT PROBABLY SHOULDN'T

Anyway, to the case in point. Is it a restomod? Possibly, seeing as there was a little bit of repair work involved in the process, but enough of the semantics. What we have here is a 964 backdate, pure and simple. And an amazing looking one at that. I can't think of anything so radical, especially in the cabin. A vast amount of work has taken place across the board.

Here comes the next eyebrow raiser: it's a Targa. Surely, you might argue, if you're going to invest a significant sum of cash in a backdate build, you're going to start with a coupe, rather than the slightly unfashionable — dare I say *unloved* — Targa? As it happens, the car's owner, Danny Witte, was already in possession of this semi-open top air-cooled 911 before the transformation began.

The car started life as a black 1992 964 Carrera 4 Targa, which he liked well enough. His three boys (aged eight, ten and eleven) loved it. They especially liked having the Targa roof off when ensconced in the back seats. Unlike a roadster or cabriolet, the Targa — as its Sicilian name suggests — provides extra shielding around the cockpit by way of a distinctive roll-hoop and greenhouse rear window, bestowing a feeling of security on the car's occupants. While Danny likes the Targa body style, he admits he isn't totally smitten with the overall look of the 964. He enjoyed the way his car drove, certainly when compared with his earlier Carrera 3.2, and he is a fan of the 964's standard 3.6-litre normally aspirated boxer, but he was never sold on the 964's attempt to bridge the worlds of ancient and modern through updated looks. Of course, many enthusiasts love the 964 for precisely this reason.

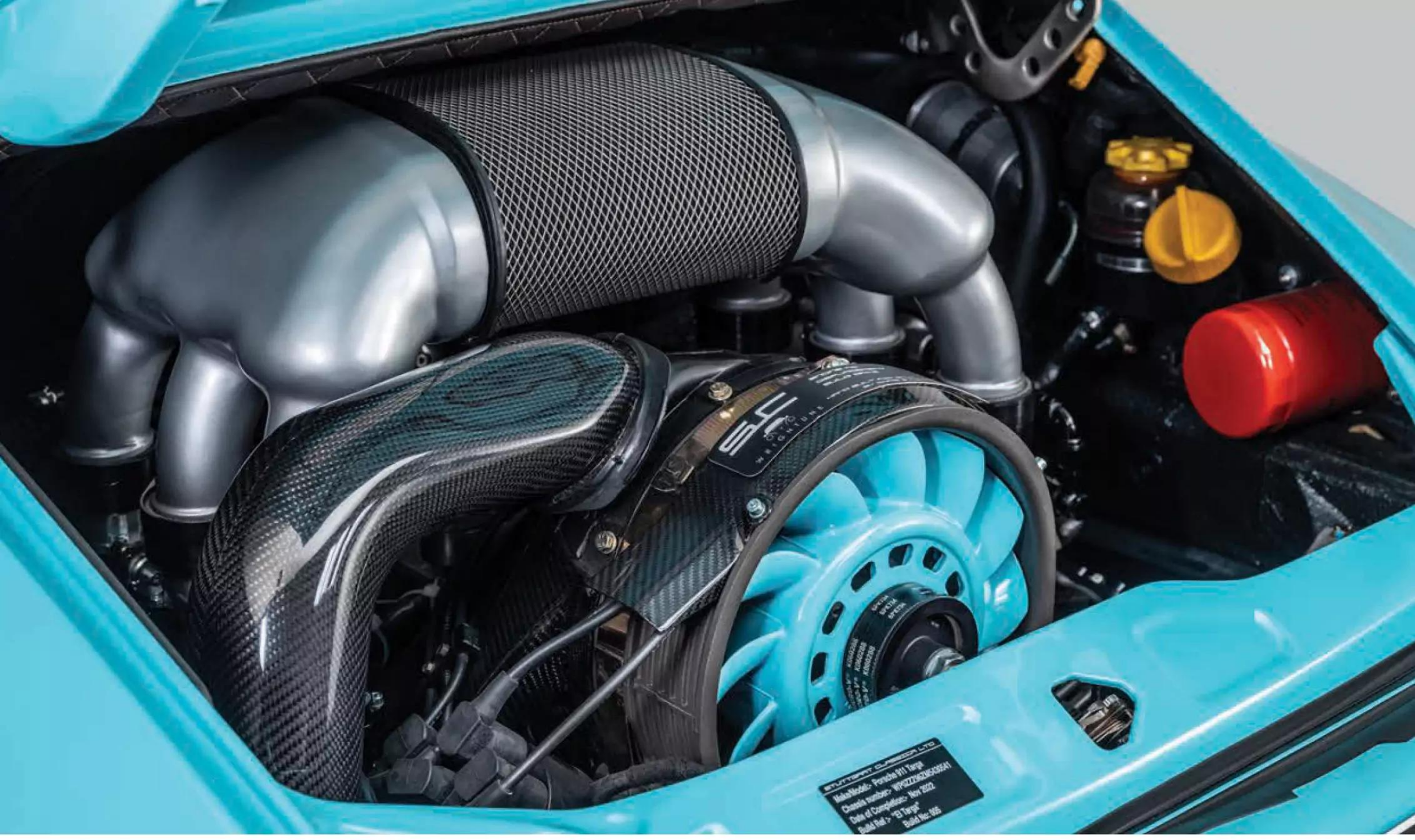
Danny sought out independent Porsche restoration and accessories outfit, Stuttgart Classica, based at Moreton-in-Marsh, where he thrashed out a plan of action with company boss, Will Chappell. "Danny approached us with a request for a custom build," Will recounts. "He had a pretty good idea of what he wanted, which always helps. He likes the fact that the 964 is quite a bit more modern than its predecessors. Already owning this generation of 911 gave him a head-start when it came to mapping out the specification he desired for the finished build, which took near eighteen months from start to finish, though this included delays in trimming the Targa roof due to the service provider, Southbound Trimmers, being very busy with a long line of existing customer work."

Danny didn't need to worry — there was plenty to be getting on with, not least as a consequence of corrosion being found after the car was stripped to bare metal. "We weren't really battling rust," Will declares, "but there are specific issues you need to be aware of when working on a 964 Targa, chiefly the condition of sills and floor panels, which can be in poor condition if the roof has been leaking." Most do. Also, the sill covers can rot as a result of dirt holding moisture between them and the bodyshell. This is all relative, though, because it's not anywhere as bad as you'll find with an F- or G-series 911.

RAISE THE ROOF

Defective window seals are also known for letting water into the cabin, especially around the rear greenhouse. "Air-cooled 911 Targa roofs aren't like you'll find on a modern drop-top," says Will. "Even when you have them retrimmed, you're almost certainly going to experience water ingress. Soggy carpets lead to rust, and though we were lucky insofar as Danny's 964 was in excellent condition, there is a fair amount of metalwork involved in backdating a 964 to mimic the look of a 911 manufactured in the early 1970s, regardless of the

Facing page Turkish Blue is a factory colour used sporadically by Porsche during the early 1970s



quality of the host Porsche.” Visually, this is a knockout 964. It retains its Targa top, obviously, and the overall retro look works well when, in truth, it probably shouldn’t. There’s reference to competition heritage, too — take a look at the central bonnet fuel filler.

Will reckons the biggest operation was the engine. “This part of the project took the longest. We got through the metalwork and paintwork stages of the build relatively quickly, but many of the required engine components were subject to a frustratingly long lead time.” I’m as keen as the next Porsche owner to fiddle around with their car, but Danny went the whole hog — not only did the look of his 964 Carrera 4 Targa get backdated, the flat-six transmuted from a 3.6 to a 3.8.

Perverse? If you’re backdating a car, shouldn’t the power unit be backdated, too?! No, of course not, but it is a question worth asking. “Danny gave the green light to pretty much every suggestion we had for his car, save for an upgrade to four litres of displacement,” Will recalls. “In fairness, it is an eye-wateringly expensive conversion and, in terms of bang for your buck, it isn’t particularly good value for money. Don’t get me wrong, the engine rebuild we settled on was by no means cheap, but we’ve got perfectly good additional power and torque from oversizing to 3.8 litres. This car hauls like a freight train. You’d need to spend another thirty to fifty grand to get the extra twenty ponies offered by a four-litre flat-six.”

Danny was clear: he didn’t want a motorsport engine, chiefly because his Targa was destined to continue serving as a family car. Instead, he wanted his 964 to be powered by an oversized boxer he could use on a daily basis without having to give thought to the potentially temperamental behaviour of a race oriented flat-six. For this reason, Stuttgart Classica concentrated on the enlarged unit’s drivability.

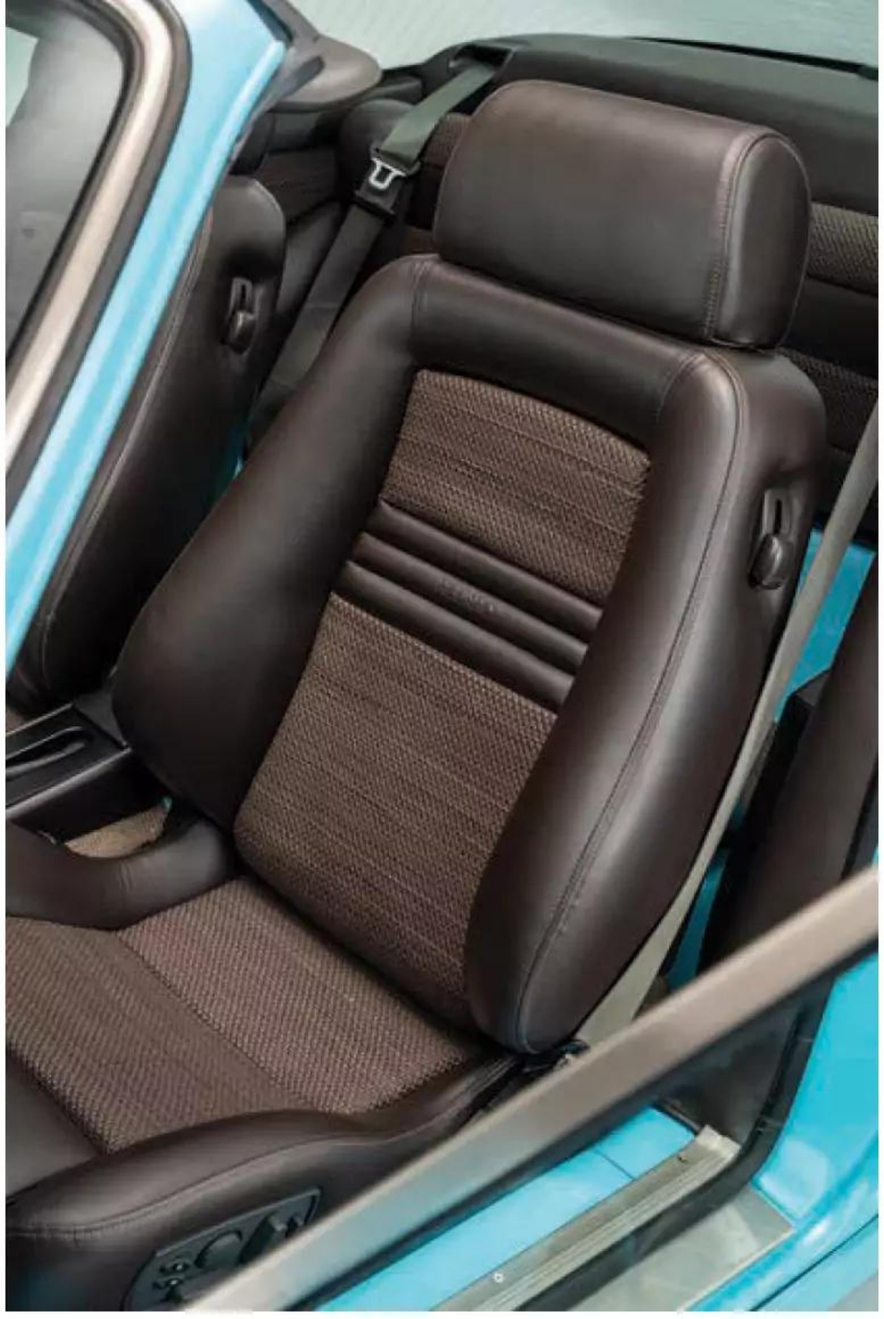
Will teamed up with Wallingford-based Porsche engine specialist, WrightTune, to partner on the project. “I went to Wrightune with an outline of the specification we wanted. Company director, Chris Wright, advised on which parts would be compatible with one another. For example, he was able to recommend the perfect match of pistons, barrels and connecting rods. He helped us select a winning combination of components able to work in harmony with one another.”

HE DIDN’T WANT A MOTORSPORT ENGINE, CHIEFLY BECAUSE HIS TARGA WAS DESTINED TO SERVE AS A FAMILY CAR

The casings were vapour-blasted, de-studded and re-plated. All new tinware shrouds were called into action, as were Mahle motorsport 3.8-litre pistons and barrels, Carrillo rods, ARP fasteners, Dougherty camshafts and a spectacular-looking GT3 plenum with central oval air filter specially manufactured by ITG. The finished engine was mapped by Neil Bainbridge at BS Motorsport, registering 373bhp and a useful 299.8lb-ft of torque. A Motec ECU is located under the passenger seat.

The engine fan is colour-coded, the serpentine belt upgraded. Carbon heater tubes and coil lead covers are in effect. Braided fuel hoses run from tank to engine. Stuttgart Classica rebuilt the gearbox with new synchros, bearing and seals after vapour-blasting the case. A limited-slipper was already in place. New rear driveshafts were fitted, but the fronts — this is a Carrera 4, don’t

Above Most of the car’s carbon-fibre componentry is covered in the gorgeous Tiffany Blue-style hue, but take a look in the engine bay and exposed weave is everywhere you look





Above and below Awesome Auto Trimming did an excellent job of transforming the car's interior by using soft-touch Vele Bourneville leather, which is finished with a super-soft pigmented topcoat

forget — have been on order from Porsche for two years. While I think of it, a bit of a heads-up on Wrightune. It's essentially a dad-and-lad operation, established by Tony Wright and run by his son, Chris, the pair aided by trusty spanner men, Mike and Joe. Back in the mid-1970s, Tony (now pretty much retired) spent two years with JW Automotive building Ford Cosworth DFV engines for the highly successful Le Mans-winning Gulf Mirage team. After a spell at Langland Motor Company in Kensington, he joined Dage Sport, which subsequently became G-Force Motorsport. After more than fifteen years with G-Force principal, John Greasley, Tony decided to start his own Porsche-only workshop. Wrightune was born.

As for Stuttgart Classica, the firm has been going since 2016 and stems from Will's family business in car sales. "My dad is heavily into Porsches and focused on the sale and servicing of Zuffenhausen's output in the 1980s and 1990s. Stuttgart Classica was created by myself and my business partner, Jase Eaton. He runs the US arm of the business and I manage UK orders, as well as those for the rest of the world outside Great Britain and North America." The operation is split between the design, production and sale of bespoke parts (representing fifty percent of trade) and made-to-order Celette bench jig restorations, including projects such as this 964 Targa backdate. "We don't sell standard replacement parts," Will comments. "We offer accessories and performance upgrades not available anywhere else. Our parts are bespoke and out of the ordinary. We are, of course, able to deliver straight-up Porsche restorations, but this isn't why people come to us. Stuttgart Classica is where you bring your 911 if you want something different to the norm."



FEAST FOR THE EYES

What a fabulous colour choice! The Targa is finished in Teurkis 340 (Turkish Blue), a hue used on a handful of 911s during the 1970 and 1971 model years. As an aficionado of 964s in standout colours, I wholeheartedly applaud Danny's choice. He did, in fact, once own an old Volkswagen finished in very similar colour, back when his family firm ran a Volkswagen parts business. He also owned a 993 Turbo, but his kids were having more fun in the Targa. As a result, the 993 was sold to fund the build seen here. A sound decision.

Look closely and you'll see all brightwork has been dull nickel-plated with a brushed finish. The wheels are staggered seventeen-inchers manufactured by Augment Wheels and styled on period Campagnolos. The arches are flared to mirror the look of those worn by the 964 Turbo. The front wings were replaced with early 911 panels, matched to a long bonnet mounted with Stuttgart Classica aluminium hinges.

In fact, the specification of this 964 reads like a Stuttgart Classica parts catalogue. For starters, you're looking at one of the firm's carbon-fibre front bumpers (the top half is painted body colour), as well as an exposed carbon splitter and bespoke carbon-fibre sill covers. The latter were custom-developed for this



particular project. The lower portion of each cover features exposed carbon (lacquered), while the upper section is body-coloured. Each cover is of a single-piece construction allowing for a backdated look without having to replace the 964's sills. Carbon-fibre was also used for the rear bumper corners. The bumper itself is a three-piece construction allowing for full adjustment at each side of the car for a perfect fit, helped by bespoke Stuttgart Classica mounting hardware.

The door mirrors are also finished in body colour, which is a first for these parts — they are usually only presented on Stuttgart Classica's projects with either a nickel-plate or black finish. The exaggerated rear spoiler and grille assembly retains the standard deployment motors elevating the spoiler at 50mph. Another sophistication is the side-mounted oil filler, which is fully functional in coordination with the 964 oil tank. The billet filler lid is inscribed in the appropriate Porsche typeface.

The aluminium centre-fill fuel tank boasts ninety litres of capacity, but open the front lid and you're presented with a very different environment to the front end of a standard 964 — or any 911, for that matter — because it's finished with a Stuttgart Classica frunk liner, allowing for organised storage of the removed Targa top. Also prominent is a Stuttgart Classica aluminium strut brace.

9eleven Raven S LED headlights are embraced by headlight rings with the now familiar dull nickel finish. They were supplied to Danny with a pair of body-coloured rings for good measure. Also fitted are Stuttgart Classica's own mesh horn grilles and a 993 windscreen wiper assembly with centre-mounted wiper arms. All light cluster borders have been painted grey to replicate the dull nickel finish of the brightwork.

The Targa lid was retrimmed in GC 955 Grey Beige. A measure of how thoroughly the task was undertaken is highlighted by the backdated front and rear window panes, complete with decorative dull nickel inserts. All internal retrimming was carried out by the talented team at Awesome Auto Trimming, located near Huntingdon.

BUMPS, COMPRESSIONS AND RUMBLE STRIPS MID-CORNER WILL BE ABSORBED BEFORE THE DRIVER HAS TIME TO REACT

The work represents just as much of a fundamental a change to this 964's identity as the backdating of the exterior. Greg Ward, head trimmer and co-owner of Awesome Auto Trimming, confirms the car's reimagined cabin centres around the installation of a Stuttgart Classica carbon-fibre tub lining the entire cockpit, forming the walls thereof and presented in body colour. "The car came to us as a rolling shell last year," he remembers. "We spent two months working on the interior. The cabin linings are finished in chocolate brown handwoven hide, which is Vele Bourneville from the Crest leather range. We bonded it to the necessary backing material, which wasn't the easiest to work with. You have to be careful to get the lines straight, as per across the back of the seats, else the finish can look decidedly amateur." Vele Bourneville produces a calming effect against the bright body colour of the dashboard. "Danny gave us plenty of leeway," Greg continues. "Given

Above Many bespoke components, such as carbon-fibre sill covers, were developed for this 964 Carrera 4 Targa, and are now available to order direct from the Stuttgart Classica website









Above Retrim extends to the front luggage area, which houses a centre-fill fuel cell and is tidied by a custom 'frunk liner', allowing safe storage of the Targa top

Right Functional oil filler has been appointed to the rear quarter panel

Below Augment Wheels Campo reps look great against the blue bodywork

free reign, you can go mad with a project like this, but it's important not to go berserk." The most challenging part of the interior? "The bits nobody really sees, such as the box in front of the gear lever," he smiles.

The seats are electrically adjustable Recaro Ergomeds ES recliners and provide both heating and cooling functionality. "We reprofiled the headrests in order to give an appearance akin to that of early Recaro sports seats," Greg reveals. "The carpets are charcoal square-weave mats, with the design mirrored in the seat centres and lower dashboard strip." The in-house manufactured switch panel incorporates all the 964 knobs and switchgear, impressively deployed in typical classic 911 fashion, and includes a full-colour touchscreen



for the appointed TracTive semi-active suspension system. TracTive's Active Controlled Electronics (ACE) dampers are equipped with patented Dynamic Damping Adjustment (DDA), a dynamic proportional valve operating as a bypass, allowing capacity for an unusually large range of damping. Capable of operating from soft to hard in a barely believable six milliseconds, a TracTive ACE system is one of the fastest-responding aftermarket suspension solutions available right now.

TACKLING TERRAIN

ACE has an intuitive ability to react to changing track surfaces and road conditions. Bumps, compressions and rumble strips mid-corner will be absorbed before the driver has time to react, easily holding the desired line through a series of high-speed bends. Grip levels in all conditions are vastly increased, giving the ability to push the host Porsche to limits the driver previously thought not possible. Configuration can be achieved by way of an in-cabin rotary switch or a full-colour touchscreen controller, allowing damping presets to be stored and activated in an instant, even when on the move.

At the very least, compare the convenience of a system like this to having to stop the car and crawl around on the floor to fiddle with on-body damper adjusters. Being able to switch between suspension settings on the fly is a huge win for the driver of any car travelling on contrasting surfaces. I'm not talking exclusively about variations between road and track — the standard of UK roads differs wildly from street to street. Being able to soften or stiffen damper rates while the car is moving across changing surfaces (or from one end of a long track to the other) is a luxury no Porsche owner will want to be without after experiencing what a TracTive system has to offer.

On the subject of chassis equipment, all standard aluminium parts were vapour-blasted and equipped with new supporting hardware. H&R anti-roll bars (twenty-four millimetres at the front and twenty-six at the rear) were



fitted alongside adjustable rear drop links, polyurethane bushes and 964 Turbo steering rack control arms. 993 Turbo brakes were installed. The car was then taken to suspension tuning specialist, Center Gravity, for geometry suited to both 911 and driver.

Continuing our exploration of the cabin, we spot backdated gauges, billet steering column stalks and a Porsche Classic Communication Management (PCCM) head unit, as well as a Classic Retrofit air-conditioning system. Of the other controls, the laser engraved five-speed gear knob is styled after that of the 917 race car. The floorboards exhibit a dull nickel finish, while the seat belts are colour-coded to Awesome's handiwork.

"I'm not a fan of small steering wheels," Danny confirms, "which is why I opted for a Tactico Racing Atelier Viceroy." Just fifty-nine such steering wheels were manufactured. Penned by Porsche buff, Glenn Cordle, the design caught the eye of Sung Kang, best known for playing the character, Han, in the *Fast & Furious* movies. Kang helped bring the design to reality exclusively for Tactico. Fitted to a removable boss and individually numbered, the wheel is 380mm in diameter, allowing clear view of the dash gauges in classic Porsche fashion — the same size steering wheel was adopted by the Stuttgart squad in the early 1970s, including during production of the 914 and Carrera RS 2.7.

A laminated white ash back (mated to a brushed black aluminium front) provides warmth and gives the Viceroy a unique look when viewed from different angles. For Danny's car, Tactico finished the rim in brown leather with stitching to match the colour of Greg's needlework.

TACTICO FINISHED THE RIM IN BROWN LEATHER WITH STITCHING TO MATCH THE COLOUR OF GREG'S NEEDLEWORK

Make no mistake, El Targa (as this 911 is eloquently known) has received a comprehensive makeover in the hands of experts in their field. Who said you shouldn't mess with a 964? This open-air Porsche is nothing short of a triumph in the art of backdating. ✪

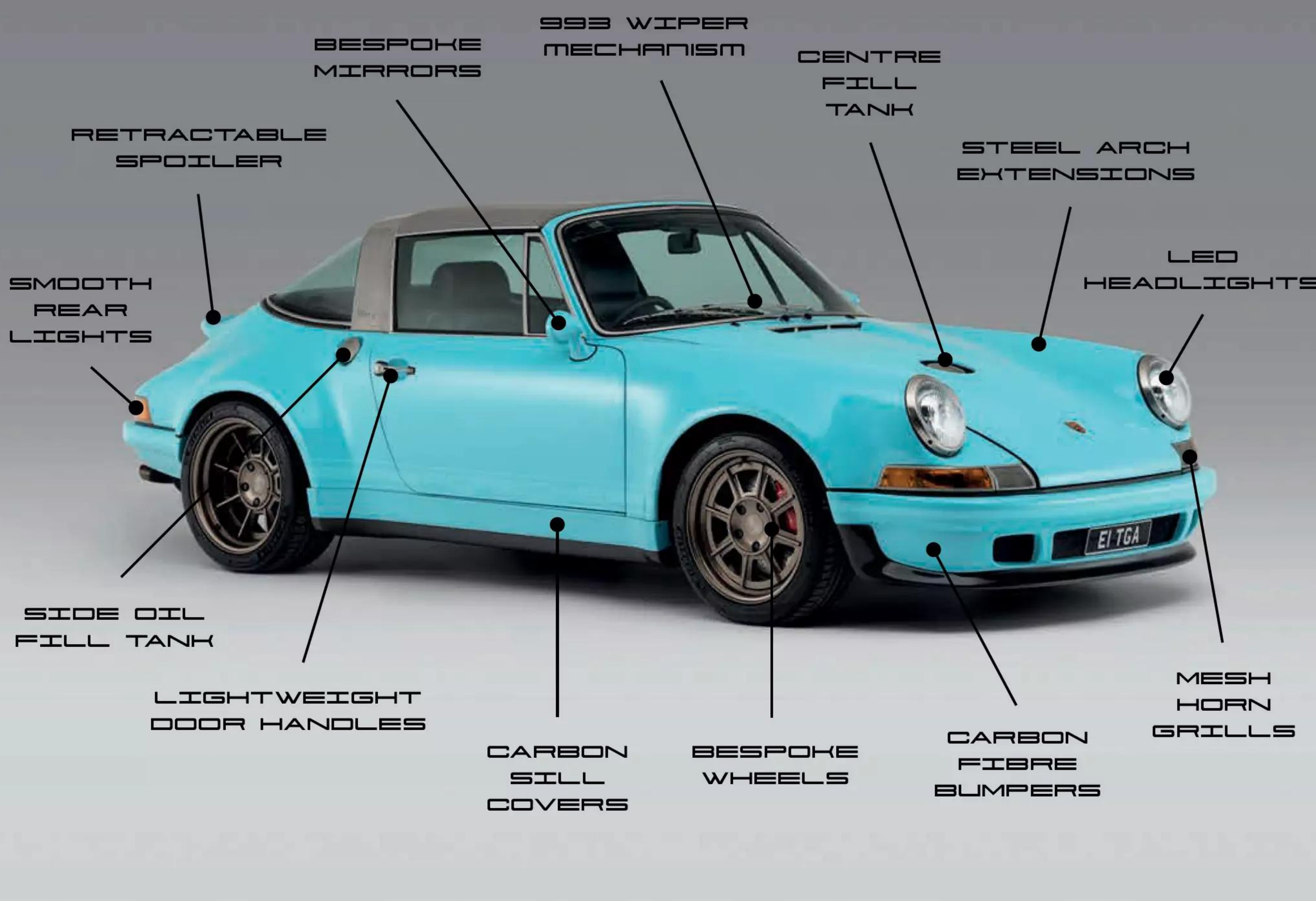
Above A superb take on a 911 backdate, this all-pawed 964 looks every bit as good static as it does propelling itself along rural backroads

Below Tactico RA Viceroy steering wheel is one of just fifty-nine examples of its kind



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THE MALTEASER

Malcolm Farrugia stands out as Malta's very own *Mr Porsche*. We head to the central Mediterranean archipelago to check out his Dakar-inspired 911 SC...

Words **Steve Bennett** Photography **Chris Wallbank**

As mantras go, *Porsche the Best* is one we can all agree on. For Maltese born-and-bred Malcolm Farrugia, it has pretty much become a way of life. Shortened to PTB, the three letters adorn all his cars, of which there are plenty. It is, if you like, his trademark. And while plenty of Porschephiles have dedicated themselves to celebrating the Stuttgart brand's output, Malcolm is right up there as an uber-enthusiast, truly living the life. Proving the point, his PTB Malta Facebook page has attracted a staggering 271,000 followers, each of them fed by his near hourly Porsche posts. It comes as no surprise to learn he is founder of Porsche Club Malta, too.

What *is* surprising is the sheer enthusiasm for Porsche on this very small island, comprising 122 square miles nestled between Italy and Libya, and serving as home to just 519,000 inhabitants. Big enough, though, to have an Official Porsche Centre in the harbour town of Msida.

What is it about Porsche and the Maltese? It was hard to miss early champions of the brand on this densely populated archipelago, which boasts more Porsches per capita than anywhere else in the world. And as we all know, enthusiasm for Porsche is highly contagious. As Malcolm explains, "discerning Maltese petrolheads made the move from British sports cars to Porsches for all the usual reasons, primarily Zuffenhausen's cast-iron reputation for producing powerful cars offering good looks, fast pace, practicality and bulletproof reliability, not to mention the ability to handle Malta's rough and ready roads." Indeed, show me an MG owner and I'll show you someone with a Porsche itch to scratch.

Given Malta's proximity to mainland Europe, the country's Porschephiles like to get out and about, safe in the knowledge their Porsches will perform and, should anything should go wrong, parts are easy to come by. "A Jaguar man," reasons Malcolm, "has to take his parts with him." Enough said.

The beauty of Malta's Porsche scene is how it is, of course, wonderfully self-contained. There's a Porsche on every street, basking in consistently good weather, which those of us in more westerly parts of Europe have to wait weeks for before taking to the road in our Stuttgart-crested sports cars. Every Porsche owner in Malta knows of Malcolm, who can be spotted darting around the island in his Outlaw-styled 1971 911 E or the Dakar-inspired 911 SC we've come to see today. He's also the owner of a 914.

He bought his first Porsche in 1998, when he was just seventeen years old. Which 911 turned his head? Oh, come on! How many seventeen-year-olds can afford a 911?! A 924 Turbo, though? That's a bit more like it. "Hugely underrated," Malcolm offers as a review of the turbocharged transaxle. "I've always liked the shape and I never really bought into the whole 'it's not a proper Porsche' thing. It was the perfect first Porsche and was my first attempt at a nut and bolt restoration, which I began five years into ownership."

TIME SPENT WORKING FOR PORSCHE MOTORSPORT OUTFIT, SCUDERIA ELEVEN, WHERE HE RESTORED 911 RACE CARS

As sure as night follows day, a 911 followed. "You don't forget your first 911, do you?" he smiles. No, you don't. "It was a two-litre 1968 911 Targa with Weber carburettors. Back in the early 2000s, classic Porsches really weren't very expensive. This is why I'm a bit of a wheeler dealer — I've lost track of all the Porsches I've owned over the years. There's been at least three 944 Turbos, a 912, various 968s, a 993 Carrera 2 with GT2 arches, my Outlaw 911 E, the 914 and even an IROC RSR replica, which was my first custom build. My latest is this 911 SC, which I refer to as PTB Safari number one."

LIVING THE DREAM

Malcolm's is a Porsche life well led, one packed with adventures and opportunities. Whilst his field of work has chiefly been in the construction industry, his talents as a Porsche restorer and engineer led to a break from the day job and time spent in Germany working for respected Porsche motorsport outfit, Scuderia Eleven, where he restored and built 911 race cars, an experience he describes as life-changing. "I learned a huge amount during my time in Germany," he recalls. "I was able to take this knowledge and apply it to my own projects. I carry out pretty much everything in-house, in my own workshop. It's a serious pursuit, although you could describe it as a hobby of sorts."

Some hobby! If you suffer at the hands of the green-eyed monster, you might want to skip to another feature in this magazine — now retired from construction work,

Facing page Jacked-up SC has been driven all over mainland Europe, including laps of the Nürburgring

Malcolm can afford to exploit his 'hobby' on a full-time basis. "I'm lucky. I can indulge my passion for Porsche all day, every day, but it's not a business. There are no customers. It's just me building the Porsches I want to build. Sometimes, I'll work on cars for close friends, but otherwise, it's me configuring and assembling the Porsches I want to drive." Fair enough. Well, we'd all do the same if we had the time, skills and resources, wouldn't we?

To his Safari-style 911. "It's definitely a Dakar thing," Malcolm admits. "I've always been fascinated by Porsche's amazing desert adventures in the 1980s. I'm also a fan of Porsche's safari efforts back in the 1970s, not that I was trying to build any kind of replica." It's prescient, too, what with Porsche's recent 992-based 911 Dakar proving to be a smash hit, so much so even Lamborghini has muscled in on the act by introducing the Huracán Sterrato. Gimmicky, maybe, but these big-tyred sports cars are certainly better suited to the average Brit B-road than their road-race-style brethren.

MIXED FORTUNES

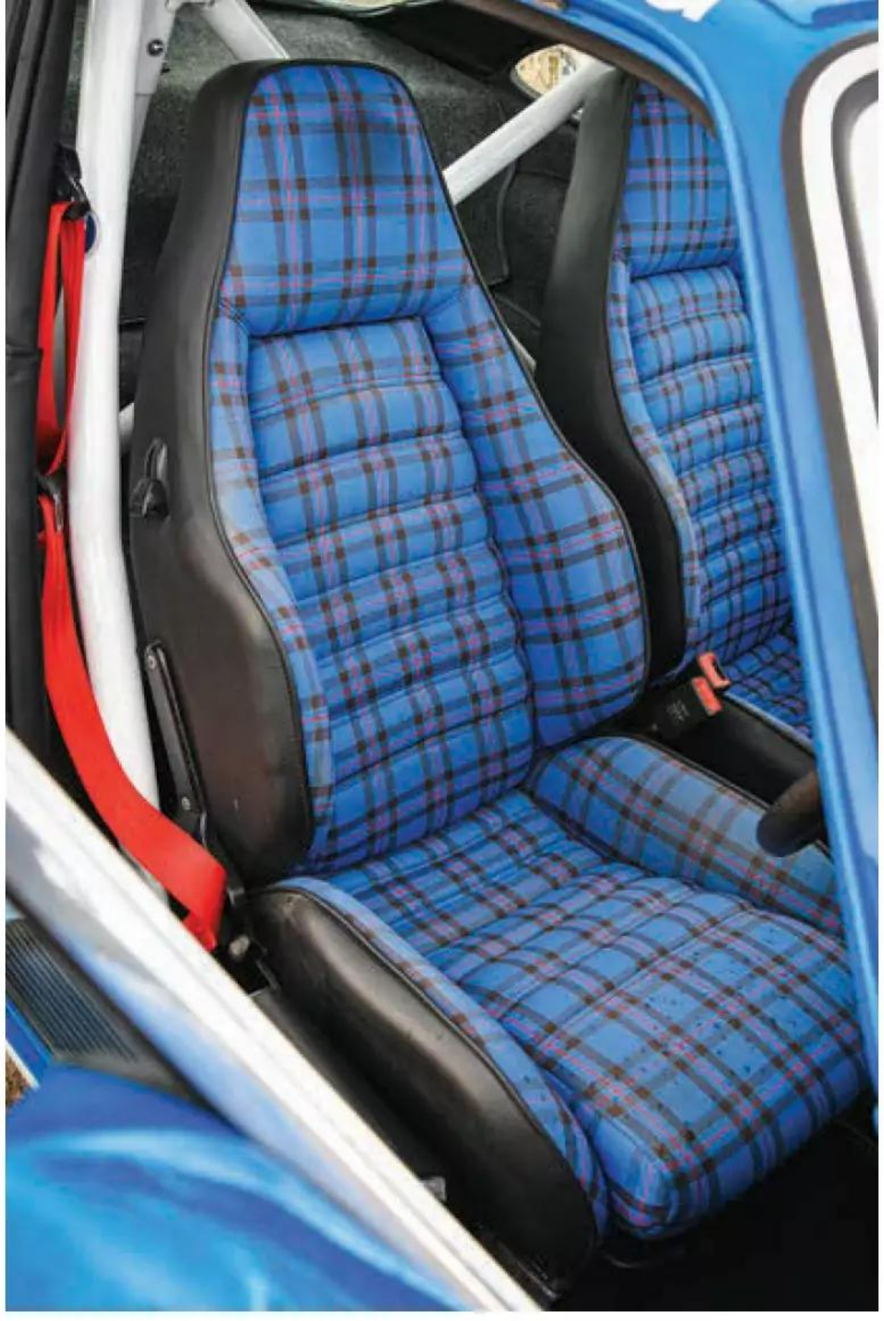
Before we look in depth at Malcolm's homage to the Porsche's factory endurance rally weaponry, it's worth taking a step back in time to relive the East African Safari Rally of 1973, 1974 and 1978, a trio of events forging a path to victory at the Paris-Dakar Rally in 1984. It's also a great reminder of the incredible versatility of the 911, from road car to endurance racer to rally hero. Little wonder the model has such a fanatical following.

The first of the high-rise Porsche works rally cars was the Bosch-liveried Carrera RS 2.7. The Stuttgart squad entered two such Rennsports into the 500km 1973 East African Safari Rally, where just making it to the finish line was considered an achievement — weather conditions in this part of the world can range from sweltering heat to torrential rain as cars tackle the roughest and toughest terrain.

Jacked up by 210mm for extra travel and ground clearance, the factory entries featured toughened floors, strengthened chassis, characteristic bullbars, light pods and even a door-mounted spotlight. There was no need for sophistication — build strong and build reliable.



Below Flat-six was liberated from a Carrera 3.2 Clubsport and has been tuned to release a purposeful 260bhp





Above and below Sport seats were originally fitted to a 911 Turbo (930) and have been gorgeously retrimmed in blue tartan wrapped around seriously comfortable foam

Despite a 110-litre long-range fuel tank and the need to carry sixteen litres of water, plus twenty litres of oil, ropes, shovels and winches, the Safari-specification 911s managed to weigh in at a relatively svelte 1,250kg, which was plenty light enough to make use of the on-demand 210bhp.

Driven by Swedish rally legend, Björn Waldegård, and Polish speed merchant, Sobiesław Zasada, these cars proved to be something of a calamity for Porsche. Myriad problems blighted the assault — Zasada barrel-rolled out of contention after three days, while in heart-breaking fashion (and in a severely hobbled 911) just a couple of hours from the finish in Mombasa, Waldegård's RS lost its oil cooler and cooked its engine. Although down the field at the time of incident, a finish at a Safari rally is a win in itself. The victor in 1973? Shekhar Mehta, who drove a Datsun 240Z (a rugged piece of kit if ever there was one).

PORSCHE TOOK A SABBATICAL FROM THE EAST AFRICAN SAFARI RALLY UNTIL 1978, RETURNING WITH A DUO OF 911 SCs

In 1974, Porsche returned to the East African Safari Rally with a further development of the same two Rennsports. Waldegård was once again appointed as driver, as was German-born Kenyan, Edgar Herrmann. A third 911 was entered as a service/case car. All three ran in the white and blue livery of logistics company, Kuhne & Nagel.

Remembered as one of the wettest and muddiest East African Safari rallies on record, the event put a severe dampener on Porsche's efforts, with both cars failing to finish the final leg. This was understandably frustrating for Herrmann, even though he was some way off the lead, but a real licker for Waldegård, who was comfortably heading for the win until his car's rear torsion bar arm collapsed. The resulting eighty minutes lost while repairs were taking place dropped him to second behind the winning Mitsubishi Lancer driven by Joginder Singh.

Porsche took a sabbatical from the East African Safari Rally until 1978, returning with a duo of swirly Martini-liveried 911 SCs for Waldegård and local Kenyan rally expert, Vic Preston, plus a service and recce mule for factory engineers, Roland Kussmaul and Jürgen Barth. The three-litre SC was a suitable advance over the Carrera RS 2.7 and featured even taller (280mm) suspension travel and clearance, a flat-six tuned to 250bhp and shorter gearing, which enabled only 130mph flat-out, but improved acceleration.

The event started well, with Preston leading the early stages, but once again, luck deserted the works team.







Even so, despite a catalogue of incidents (weather and mechanically related), Preston finished a creditable second, with Waldegård back in fourth. To win the East African Safari Rally in 1978? For this, you needed to be Jean-Pierre Nicolas in a Peugeot 504. It sounds unlikely, but go to any part of Africa today and you'll still see plenty of rugged 504s on the streets.

That was that for Porsche and the Safari, although the epitaph is very much the modern success story of various 911s entered into the *Historic* East African Safari Rally by marque specialist, Tuthill.

Porsche somewhat lost its spirit of off-road adventure, but found it again in spectacular style — in 1984, the manufacturer entered the Paris-Dakar Rally with the Type 953. Based on a Carrera 3.2, this formidable motorsport machine featured four-wheel drive (a much simplified version the 959's setup, which Porsche would reveal later). Power is never an absolute requisite for endurance events — 250bhp was deemed enough. Developing a tough car is crucial, though, and the 953's heavily reinforced shell rode out the terrain on double-wishbone suspension, with twin dampers in each corner and 270mm of travel. Twin fuel tanks (120 litres up front and 150 litres at the rear) meant the Dakar 911s could run long and fast.

THE CENTRE OF GRAVITY HAS TO BE CONTROLLED, OTHERWISE CORNERING DEGENERATES INTO A LURCHING, ROLLING MESS

Driving duties fell to Jackie Ickx and Rene Metge. The stars were aligned. Twenty days and eleven thousand kilometres later, Metge reached Dakar ahead of a field of specialist-built off-road machinery. Ickx finished sixth, despite having been down in 139th place due to an electrical fire. This was a stunning achievement for a sports car and one repeated in 1986 by Metge in the altogether more esoteric 959.

History lesson over. It's time to return to Malcolm's 911, which clearly takes influence from all of the above. The base SC was acquired in exchange for his previous 944 Turbo. "It's the trader in me," he chuckles. "That and the fact I hoard parts left over from other projects. Many of the backdate panels I already had in my workshop. Wings, the long bonnet, slam panel and so on, all of it

Above Influences from Porsche's East African Safari Rally entries are clear to see









Above and below R-style exterior trim, including bumpers and rear lights, were bought specifically for this project, while other parts used to complete the early 911 look were already in Malcolm's stockpile

was in stock, so to speak. In contrast, the lightweight R-style panels, including the front and rear aprons, were sourced specifically for this project." A ducktail also features, a nod to Porsche's East African Safari Rally entries in 1973.

The shell was originally finished in Arrow Blue, which Malcolm has retained. This colour works brilliantly with the white front and rear aprons, which are complemented by white Carrera script reversed out of white-painted sills. There's also a white bonnet and Martini Racing stripes. Chrome trim adds a tasteful bit of bling, as does the quartet of yellow-lensed Cibie spotlights. A roof rack? Well, of course, and ordinarily it would be carrying a spare wheel. Unusually, Malcolm has retained the car's electric sunroof. "Malta gets very hot," he explains. Hot enough for a Classic Retrofit electric air-conditioning system, in fact. "The car has to be usable. I've driven it big distance all over Europe. I need the cabin to stay cool." Yep, this 911 is cool in more ways than one.



Riding high in every sense, Malcolm has installed sixteen-inch Fuchs wheels wrapped in chunky 215/65 Falken Wildpeak all-terrain rubber. The Japanese tyre giant, clearly knowing a good promotional opportunity when it sees one, keeps Malcolm stocked with black circles. His parts stash, meanwhile, generated a Carrera 3.2 engine. This isn't any old 3.2, but the donkey from a Carrera 3.2 Clubsport. Granted, at 231bhp, power from the Clubsport's boxer is nominally the same as that of the standard Carrera 3.2, but it does have lighter valve gear for a more rev-tastic response, as well as a redline raised from 6,520rpm to 6,840rpm, meaning keen drivers can hang on to a gear for longer. Malcolm clearly falls into this category, as evidenced by his decision to further modify the air-cooled powerplant with uprated camshafts, plus a lightweight flywheel, among other changes. A wholesome 260bhp is the result.

PERSONAL PREFERENCE

The transmission is the love it/hate it Type 915, beefed up with a limited-slip differential and a 911 Turbo (930) oil cooler. Whichever side of the 915 fence you happen to be on, the shift quality is enhanced with a chunky CAE Ultra Shifter, which does much to eliminate the 915's vagueness. It looks good, too.

Of course, on any Safari- or Dakar-inspired project, suspension is a crucial element. Ride height and travel are what it's all about, but at the same time, the higher centre of gravity has to be controlled, otherwise cornering degenerates into a lurching, rolling mess. Malcolm's car makes use of a system somewhere between the 1970s Safari 911 torsion bar/damper setup









and the 1980s double-wishbone/twin coilover solution. To this end, Bilstein RSR-specification coilovers are paired with custom-rate springs.

Bringing the show to a halt, he has fitted modern four-piston aluminium calipers and bigger vented discs, as well as cockpit-adjustable brake bias via a dash-mounted Tilton toggle. Lift the lightweight, composite bonnet and a 130-litre fuel tank hogs the space, nestling alongside a strut brace, chunky high-torque battery and a ten-litre aluminium windscreen washer reservoir.

Being in charge of a long-distance adventure Porsche, Malcolm has struck a balance between rally aesthetic and a modicum of comfort, the latter represented by smart, tartan-trimmed, 930-sourced Sport seats with matching tartan inlays on the lightweight door cards. The rear seats have made way for a half roll cage. A quality Blaupunkt sound system, USB ports and twelve-volt chargers handle the requirements of modern travel. Oh, and Malcolm is rocking a CB radio for those *breaker, breaker, ten-four* moments.

OUT AND ABOUT

You don't build a car like this and not use it — leaving this 911 SC in a state of suspended animation would be an affront to those who created Porsche's Safari and Dakar cars, not to mention those who drove them. Aside from traversing the roads less travelled by a typical example of a Malta-domiciled Porsche, Malcolm reels off a list of recent European road trips, including tracing the path of the Targa Florio. Having driven those roads, we can only agree with him when he says more (rather than less) suspension is what's needed.

Needless to say, the Porsche Museum in Stuttgart is a favourite destination for man and machine, as is the Colosseum in Rome. He attended the sixtieth anniversary of Porsche Club Nürburgring in 2021, too. Did he go on track? Of course, that's the spirit of adventure. Footage of his laps exists on YouTube. We ask Malcolm how the car held up at the Green Hell.

"Amazing, even with the spare wheel on the roof," he grins. "This is such a versatile 911. A real 'go anywhere, do anything' classic Porsche." He obviously isn't the sort of enthusiast to dote on a garage queen. "Porsche is the dominant force in my life. Porsche, the best!" he grins, reminding us of the meaning behind PTB Malta. Speaking of which, for Porsche enthusiasts, this is the place to be. The chances of seeing Malcolm ragging his Dakar-inspired 911 SC? Almost as high as the car's suspension travel. ✪

Below Bonnet has been signed by many of the Porsche luminaries Malcolm and this brilliant 911 SC have encountered on their travels



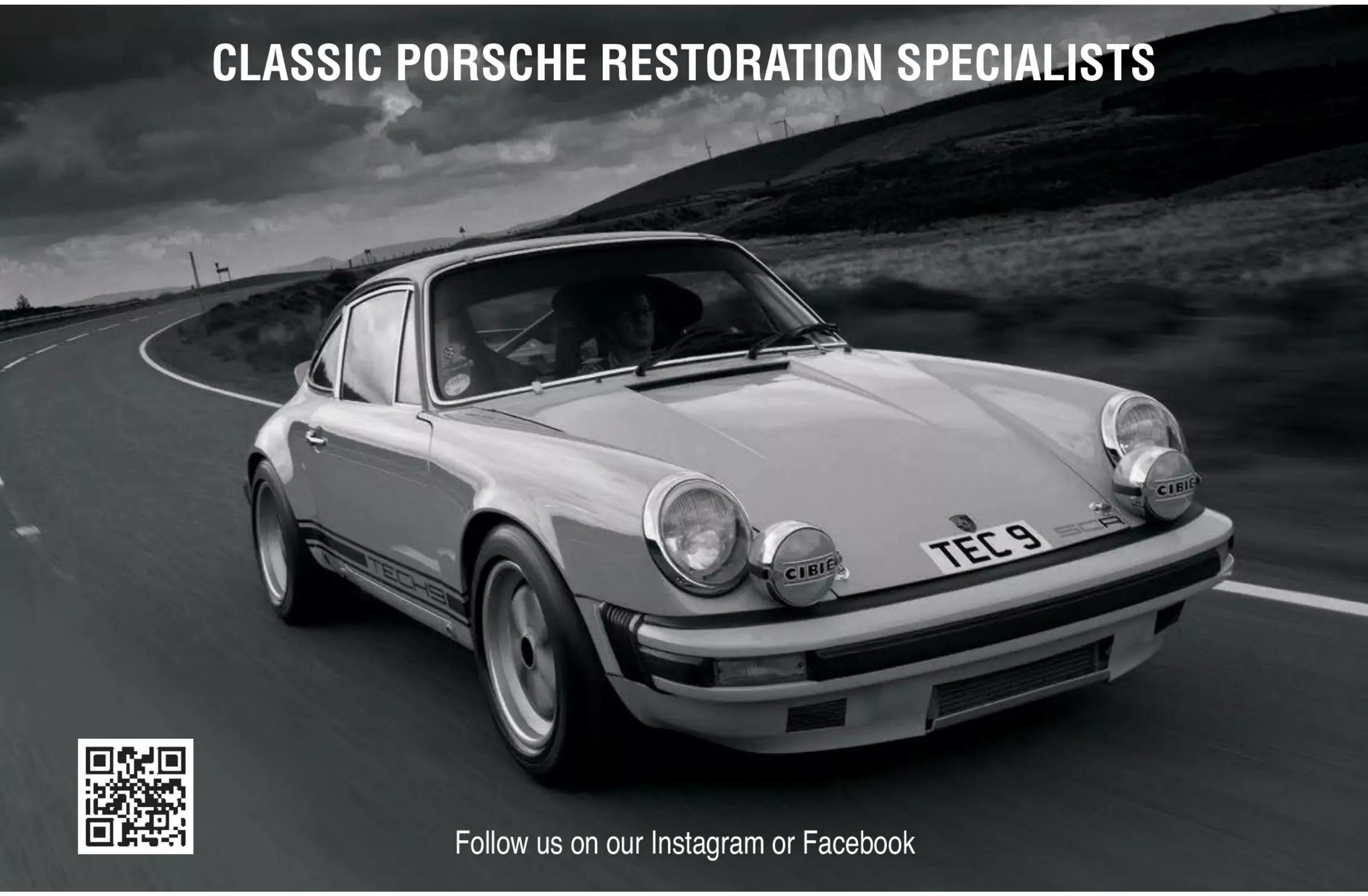
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HALF LIFE

Inspired by the Porsche sports-prototypes of the mid-to-late 1960s, the Oilstainlab Half Eleven was one of the star attractions at the recent Goodwood Festival of Speed...

Words **Dan Furr** Photography **Dan Sherwood**

There was much for Porsche enthusiasts to celebrate at the recent Goodwood Festival of Speed. Singer Vehicle Design wowed the thronging masses with a demonstration of its reimagining of turbocharged 911s, while the highly anticipated Supercar Paddock impressed with a variety of Stuttgart-crested sports cars. Porsche itself used the event as a means to showcase the brand-new 911 (second-generation 992) and the all-electric Macan, which featured as part of what Porsche Cars Great Britain billed as 'Porsche House', essentially the brand's central exhibition feature. So far, so, er, conventional. Yes, even Singer's 964-based reimagining of 911s is hardly the stuff of surprise at what has become one of the world's most celebrated automotive events. For attending Porschephiles looking for something a little more leftfield, however, help was at hand in the form of the Half Eleven.

We know what you're thinking — it's wild, it's wacky, it's... familiar, and not just because the front-end looks nine-eleven-ish. The Half Eleven is the brainchild of twin brothers, Nikita and Iliya Bridan, car designers who were called upon to fashion the body of Hoonipigasus, the 1,400bhp 912-based monster prepared for late gymkhana and rally star, Ken Block, to conquer Pikes Peak Hill Climb. Low-slung and decorated in 1971 917/20 'Pink Pig' tribute livery designed by artist, Guccighostas, Hoonipigasus was created with one goal in mind: to be the fastest contender at the world's most revered hill climb.

The Bridans are professional car designers, although their story is far from ordinary. Born in Ukraine and raised in rural Canada, the pair dropped out of high school almost as soon as they hit their teens, resuming their education in Italy, where they studied coachbuilding. Nikita tells us the Bridan clan regularly holidayed overseas — travelling through Europe exposed the boys to a variety of exotic four-wheelers serving as the catalyst for their love of sports cars. Indeed, a generous supercar sales showroom manager in Spain allowed the then young twins to climb inside a brand-new Lamborghini Diablo, thereby kickstarting their fascination with sports car form.

Facing page Nikita drove the car from Los Angeles to New York before readying it for Monterey Car Week

Though the Italian stallion served as inspiration for what was to come from Iliya and Nikita, the Gordon Murray-penned McLaren F1 galvanised their love of automotive exotica and set them on the path they find themselves treading today, namely showcasing their work at the Goodwood Festival of Speed (alongside a McLaren F1 GTR, as luck would have it). The Half Eleven is no DIYers effort come good, though — following time served studying in Italy, the Bridan boys moved to Pasadena, California, continued their formal education, graduated, then sought employment in the sphere of automotive styling. As if these two are one, the pair were offered work placement *together* at Toyota, before they moved *together* to Honda, where they worked on the design of SUVs. Nikita switched allegiance and joined the design office of a well-known South Korean OEM, before finding himself at the US offices of General Motors Advanced, effectively the arm of the company responsible for spotting design trends, monitoring consumer behaviour and informing the look of future output across the brand's many marques.

WHEREAS ITALY TAUGHT THEM HOW TO MAKE A CAR BEAUTIFUL, AMERICA SHOWED THEM HOW TO MAKE A DESIGN FUNCTIONAL

A decade is a long time in the field of vehicle design and development. Needless to say, the Bridan twins learned a lot — whereas Italy taught them how to make a car beautiful, America showed them how to make a design functional. After all, there's little point sketching a concept for a new car if your drawings depict a shape and style at odds with the nuts and bolts intended for installation. And it probably goes without saying, but in an age of dealership customers being hell-bent on buying crossover utility vehicles, mass-volume manufacturers aren't the first organisations springing to mind when one considers radical new vehicle designs. Unsurprisingly, the boys needed a way to exercise their creative flair without the restrictions impressed upon them by corporate guidelines. And so, Oilstainlab was born as a privately owned independent automotive design consultancy. How to get the name to stand out in a decidedly crowded arena, though? Development of eye-popping custom vehicles and visibility at the world's highest-profile car shows, of course, hence the Half Eleven and its appearance at Goodwood.

A series of modified Alfas came before the Bridans turned their attention to air-cooled Porsches. A Marlboro-

styled Carrera RS-alike soon emerged from their workshops in Signal Hill, California, before word spread about 'son of Hoonipigasus' (albeit independent of the Hoonigan brand). This was late 2021, and despite the tin-top lid adorning the prototype you see on these pages, the car was, in fact, a Spyder. It was also an experiment in automotive design, fusing the learnings Iliya and Nikita acquired throughout their education and work lives. As you're about to discover, this amounts to melding European coachbuilding and design with American mechanicals and the efficiency of Japanese OEMs.

The roots of this particular build stem from a love of the sports prototype racers of the mid-to-late 1960s. Many of you will regard this as the golden age of motorsport, where ballistic-power race cars weighing little more than a gnat's whisker propelled their occupants around the world's race tracks in stupefyingly quick (and dangerous) fashion. Drivers jumped into sometimes crudely prepared cars knowing their date with destiny could result in a victorious win celebrated for years to come. On the flipside, death was a very real prospect — the era's high number of fatal accidents seemed to provide motorsport scribes with just as many column inches as the races themselves. Driving at the top level of motorsport, whether endurance, rally or formula racing, was a gladiatorial pursuit. Little wonder surviving drivers of the period are held in such high regard today.

After the Bridans prepared their initial drawings of what was to become the Half Eleven, they embarked on what can only be described as a novel marketing campaign. Taking the form of doctored period photographs featuring the Half Eleven skilfully inserted into classic motorsport scenes, the work generated confusion and excitement in equal measure after being posted across Oilstainlab social media channels. Suddenly, there was a hitherto unrecognised Spyder-styled Porsche alongside 917s, 908s and 910s in the pit lane at the 1969 24 Hours of Le Mans. A familiar-but-unusual Porsche resembling a possible variant of the 909 Bergspyder replaced a Gulf-liveried short-tail 917 next to an orange 914 on the track at Spa in 1970. Vintage action shots captured at the 24 Hours of

Above Following many years working in the styling departments of OEMs, the Bridan twins are using the Half Eleven as a promotional tool for their design consultancy business, Oilstainlab



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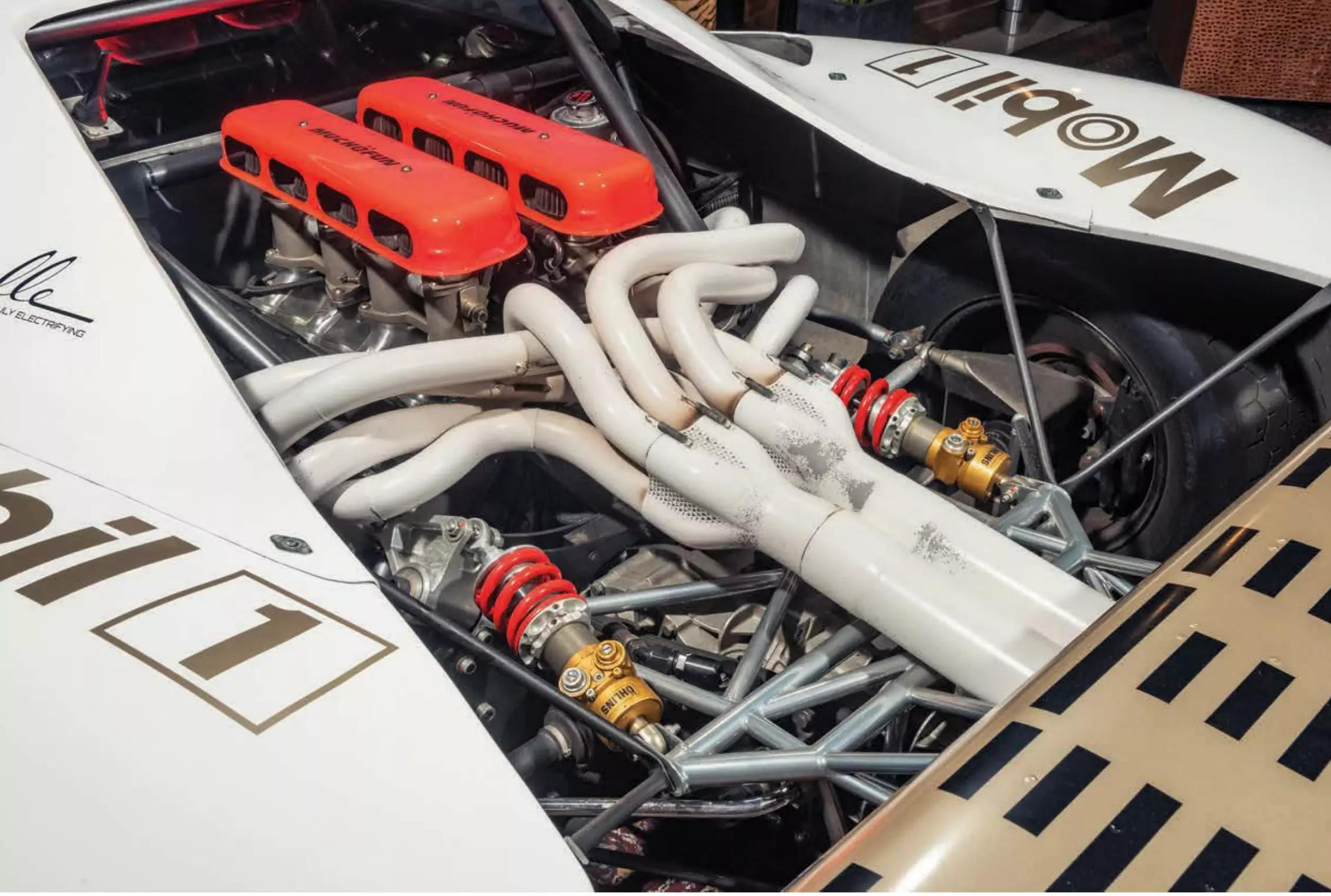


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Daytona and at the Targa Florio didn't escape the Bridan duo's mischief making, either.

Things ramped up when reimaginings of Erich Strenger-designed Porsche motorsport posters created in the 1960s began to appear with the Half Eleven pictured in place of winning cars. The imagination (and, it must be said, outrage from some quarters) of Porschephiles had been captured.

A HITHERTO UNRECOGNISED SPYDER-STYLED PORSCHE ALONGSIDE 917s, 908s AND 910s IN THE PIT LANE AT LE MANS

Introduction over, it was time to build the car. There was only one problem — automotive stylists aren't always equipped to tackle the fabrication and assembly of a vehicle. For this reason, the Bridans enlisted the support of Scarbo Performance, an automotive design and manufacturing company counting BMW and Volkswagen among its OEM clients, as well as TRD Racing Development and Porsche specialist, BBi Autosport, as its independent customers. Not lost on us is BBi's involvement in preparing Hoonipigasus for action at Pikes Peak.

Scarbo Performance was established in 2008 and was a response to demand for the work undertaken by company founder, Joe Scarbo, as a mechanical design engineer for a number of celebrated race teams. By Nikita's own admission, his and Iliya's practical experience of vehicle assembly is lacking, but Joe was more than capable of taking their form-led drawings and turning them into function-fulfilling designs using computer-aided 3D design software. This led to the creation of a complex tubework chassis and suspension mounting system in high-tensile chromoly steel.

The Bridans were adamant the overall shape of their design shouldn't change unless absolutely necessary, giving Joe plenty of food for thought. Chief among the twins' concerns was a desire to maintain a super-low ride height dictated by a super-low body, as per the Porsche sports prototypes of the late 1960s. To all intents and purposes, as far as Nikita and Iliya were concerned, the layman should be able to look at the Half Eleven and be convinced they are looking at a genuine classic race car.

Obviously, the choice of powertrain would have huge impact on how Joe approached the task at hand. Here's where we upset many of you, albeit only temporarily (stay tuned, folks). Where one might expect a fearsome air-cooled boxer at play sits a brand-new General Motors LS-series V8 from JMS Racing. Modified with a large bore and short stroke, the engine redlines at close to 9,000rpm and will generate a useful 650bhp on regular pump fuel. Screaming through independent throttle bodies and fully exposed free-flowing headers, this choice of powerplant certainly isn't one for Porsche purists, although coupled to the big ol' chunk of 'Merican muscle is a gearbox lifted from a 996 GT2. The engine is managed by a Holley advanced standalone electronic

Above Joe Scarbo's team designed and fabricated the custom tubework chassis, which allows the engine and 996 GT2 transmission to sit low, thereby maintaining the desired GT40-ish body height









Above JMS Racing LS-series V8 chucks out massive torque and delivers a redline close to 9,000rpm screaming through independent throttle bodies and an Inconel exhaust

Right Öhlins RSR-specification suspension is clear to see

ignition and fuel injection system. To maintain the car's chopped body height, and to observe a mid-engine layout, Joe had to position the bent-eight low in the chassis and rotate the gearbox more or less upside down. The suspension components are 911 RSR-specification items from Öhlins. The wheels are huge deep dish 917-style five-spoke centrelocks wrapped in chunky Avon racing rubber.

You might be thinking the body is a fibreglass construction, but Joe's team fabricated the panels from aluminium. Various aero components are made from carbon-fibre. A donor 911 was secured for the starting point of the project, but looking at build photographs, as well as the finished article, it's difficult to see exactly where the original car remains. The traditional five-layout dash dials, floor pedals and headlamp bezels appear to be all that remains, although we're told the donor's VIN plate has been retained in order to make the Half Eleven road-legal. Yes, this Porsche-inspired prototype might have been designed and assembled with an attack of the track in mind, but it can be driven on the road, as the Bridan twins demonstrated with a coast-to-coast trek from Los Angeles to New York and a zip around London not long after the build was finished.



GOING UNDERCOVER

In advance of the trip, Spyder styling wisely made way for a tin top. Despite its name, Nikita assures us the Half Eleven was always intended to be a coupe, enabling the full force of the GM V8 to be unleashed in relative comfort. Granted, three thousand miles of roaring exposed exhaust and a cramped cockpit doesn't sound like the greatest recipe for a comfortable long-distance drive, but we're told the leather-trimmed Speedster-style composite buckets seats are perfectly enjoyable, and the incorporated SRC in-car communications radios allow driver and passenger to communicate above the noise. The less said about heat in the cockpit, the better.

So, then. What exactly is the point of the Half Eleven? Artistic expression from two talented designers constrained by the rules and regulations associated with developing new cars for OEMs? Certainly, but at its core, the Half Eleven is simply a promotional tool for Oilstainlab's consultancy services. This means you can't buy the car. That said, interest in the project has been so great, and enquiries have been coming in at such a rate, Nikita and Iliya have decided to produce a strictly limited run of twenty-five cars using the Half Eleven as a starting point. "This project has taken us far beyond our wildest dreams," Nikita admits, recognising worldwide interest in this most unusual of builds. "The Half Eleven has delicately navigated our passion for the past, but also focuses on the present and future. This car is beyond analogue. It is raw, honest and grin-inducing. These characteristics will always be part of Oilstainlab's DNA, but now, with a touch of civility influenced by our time working at OEMs, not to mention our exposure to vehicle series production manufacturing, it's time for Oilstainlab to launch into its next phase of development."



What's next remains something the boys are keeping tight-lipped about, but a sneaky peek at the *hf-11.com* website reveals a render of an intriguing monocoque accompanied by the following teaser: *a carbon-fibre asylum for those refusing to compromise*. Also pictured (camouflaged in spy-repelling vinyl wrapping) is what we anticipate to be the Oilstainlab production car inspired by the Half Eleven. This is where we attempt to undo the offence caused to some of you by revealing the adoption of a General Motors V8 earlier in this article. You see, the customer is always right. In other words, if you want a bonkers-specification air-cooled flat-six to power your Half Eleven derivative, then you can have a bonkers-specification air-cooled flat-six to power your Half Eleven derivative. In defence of Iliya and Nikita, use of a brand-new LS V8 makes a lot of sense considering these engines remain in production and their performance enhancements (supercharger, anyone?) and spares are in abundance. A 6.2-litre crate LS-series Gen IV small block V8, for example, is certainly going to cost you less than rebuilding an air-cooled Porsche boxer and will deliver a whopping 486lb-ft at 5,200rpm in normally aspirated trim. Then, of course, there's the fact Joe designed the Half Eleven's chassis with an LS V8 in mind.

We're not here to extol the virtues of Detroit muscle over Stuttgart strength, though. The bottom line is simple: the Half Eleven is obviously linked to classic Porsches — historic classic Porsches in particular — and it therefore stands to reason buyers of the production variant might want to see a screaming air-cooled Porsche boxer when peering into the engine bay. As you can see, it's a big space, which is why Nikita isn't discounting the appointment of a flat-eight or even a flat-twelve. With this in mind, it's clear the only limitation is the depth of a buyer's pockets.

THE HALF ELEVEN WAS ALWAYS INTENDED TO BE A COUPE, ENABLING FULL FORCE OF THE V8 TO BE UNLEASHED IN COMFORT

Where the Half Eleven initially made waves with a mix of exposed aluminium bodywork and a yellow nose bringing to mind the legendary 907, the Oilstainlab machine's appearance at Goodwood owed more than a passing nod to the aforementioned Marlboro-decorated 911. It's the colour scheme the car wears during our private audience with it at Duke of London, the family operated classic car sales hub located in West London, where the Half Eleven has been stationed since its run up the famous Goodwood hillclimb. By the time this magazine hits newsstands, the car will be winging its way back to North America en route to Monterey Car Week, where we have no doubt the Bridan twins will be on the receiving end of many questions relating to this unusual project car, which has secured sponsorship from oil giant, Mobil, and automotive apparel brand, Peaches. We can't wait to see what the boys do next. And yes, we're assured it will be air-cooled. ✪

Above Roof is a recent addition following years the car spent as a Spyder

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GREY ANATOMY

Exuding class, Julian Parker's Ninemeister-built, 964-based restomod drives every bit as well as it looks...

Words **Steve Bennett** Photography **Dan Sherwood**

Thirty-five years of 964? Goodness, how did that happen? There's nothing like an anniversary to make us feel old. That said, the 964, when ushered in for 1989, was the antithesis of old. It was the 911's brave, modern, 'new world' future. Turning its back on the G-series cars of yore, the 964 featured a bold, smooth new look. Out with impact bumpers, in with slippery front and rear aprons. In, too, with an active rear spoiler and a low-drag flat floor. So long Fuchs five-leaves, welcome Design 90 wheels, shared with Porsche's transaxle family of products.

Back in the mid-to-late 1980s, and well into the early 1990s, no automotive feature suggested modernity quite like four-wheel drive. Think Audi Quattro and the mighty 959. The 964 therefore got all-wheel drive, plus a 247bhp 3.6-litre engine, complete with twin-plug ignition and dual distributors to better burn then modern 95-octane unleaded fuel. Modern too, was the adoption of power steering and suspension with MacPherson struts and coil springs, replacing the 911's torsion bars, which could be traced back to the very earliest Porsches. There was anti-lock braking, too. Oh, and let's not forget the sequential Tiptronic transmission for an easier driving experience. Don't scoff — Walter Röhrl raced a Tiptronic-equipped 964 Carrera Cup car with some success.

The 964 was claimed to be eighty-seven percent new over the outgoing Carrera 3.2, which is kind of odd, because most 964s are seemingly now eighty-seven percent old. How and why has the 964 gone from being the unloved 911 to being the blank canvas homage to the restomod art, though?

Well, the 964 being unloved is key. You think the 996 gets it in the neck? In the early 1990s, the 964 was rounded on in much the same way. The engine was incontinent, electrical gremlins proliferated, distributor drive belts failed (sometimes catastrophically, as fellow *911 & Porsche World* contributor, Jonny Tipler, knows only too well), the dual mass flywheel was a troublesome appendage, and those supposedly brave new looks were deemed more miss than hit. Even within Porsche, the 964 was not at all popular, with factory engineering boss, Helmuth Bott, being particularly offended by the MacPherson strut suspension, for some reason. Never mind the fact this was a dynamically better 911 — all these complaints kept prices low and ushered in the 993 earlier than many anticipated. Indeed, the 964 was canned after little more than four years.

That said, for all the supposed vitriol, Porsche still built more than sixty-three thousand 964s, which isn't much below the 993's sixty-eight-thousand-unit production run. Not *too* shabby, then. And it's a good job, really, because they'll all be needed to satisfy restomod demand, or so it would seem. Thing is, though, the 964 has always been a much-modded 911, and for all sorts of reasons, but mainly because of values. Back in the good old days of the late 1990s and early 2000s, when half-decent 964s could be picked up for as low as eleven grand, 911 enthusiasts weren't too precious about hot-rodding them. The favourite and easiest path was that of creating a 964 Carrera RS lookalike. Engines, once oil-tight, were easy to fettle and responded well to a bit electronic tuning. And while the suspension might not have been especially sophisticated, it was easy to slam, as well as simple to overhaul with fully adjustable coilovers.

FROM ITS EARLY ROOTS TO THE HERE AND NOW, THE 964 HAS BECOME THE BLANK CANVAS FOR RESTOMOD CREATORS

STRANGER THAN FICTION

Time travel and Porsches has always been a thing, whether forward or backward. In the mid-1970s, the future was Turbo. Many unsuspecting pre-1974 911s got the 930 look. Porsche's pick-n-mix parts bin helps, as does a bodyshell effectively remaining the same from 1963 to 1989. Tastes and fashions change and mature, but it's fair to say 'retromania' came of age in the 2000s, when the backdate scene really began to take off, fuelled by cheap donor cars. Think Carrera RS 2.7 evocations created out of tired 911 SCs or fractionally more expensive Carrera 3.2s. You could easily create a classic Rennsport replica for less than £20,000.

When did 'backdate' become 'restomod'? Difficult to pin that one down, but as surely as night follows day, given its bodyshell heritage, the penny began to drop that the modernist 964, with a bit of work, could be sent back in time. And again, given its unloved status and values, nobody was going to be too precious about such a notion. With its rather more modern underpinnings, the 964 was a beguiling prospect, capable of delivering

Facing page Making use of a 993 Carrera 4 transmission system and backdated to look like an F-series 911 S, this gorgeous grey 9m11s is the product of Ninemeister's 9m tuning and restoration division and is based on a 1990 964

an early look, but with real performance. Restored and modified, this was surely the genesis?

Whatever, from its early roots to the here and now, the 964 has become the de facto blank canvas for restomod creators keen to curate their own bespoke 911. The process is not without its challenges, as early adopters will testify, but today, a 964 can convincingly replicate any classic 911 short of, well, short of short-wheelbase.

PORSCHE PARTNERS

'Convincing' certainly sums up Julian Parker's 9m11S Touring, affectionately known as Project Abbi, named after his wife and co-collaborator in the project. London-domiciled, Julian is a Porschephile through and through. He's the custodian of a 991 Carrera GTS and boasts Porsche ownership history including "a yuppie-spec Carrera 3.2" and "a restomod not quite hitting the spot." Work carried out wasn't terribly good, which is why he handed the car to the team at Warrington-based independent Porsche specialist, Ninemeister, where the engine was sorted. "It became the best bit of the entire car," he laughs. "This is how I found myself talking to Ninemeister boss, Colin Belton, about the possibilities available when developing a 964 restomod. He really opened my eyes to the wider world of modifying and backdating these cars. Ultimately, I ordered a 9m build."

Every Porsche project must have a beginning. Julian's car started life as Guards Red 1990 964 Carrera 4 and was suffering the effect of a minor engine bay fire. "I agreed a price of forty thousand pounds for the donor car," he continues. "I wanted Carrera 4 underpinnings because I like the security offered by four-wheel drive. The system is quite basic, but Colin had suggestions for radical improvement." Indeed he did, and handed the reins to project boss, Rob Wright. "Really, this is Rob's car," Julian jokes. "I just let him get on with it and signed the cheques." Interestingly, when we speak to Rob, he doesn't entirely disagree with Julian's statement.

We'll get to the four-wheel drive system, but first up, the decision was made to make the donor 964 look like a 1972 911 S 2.4. There are various ways and means of doing this, but it isn't as straightforward as if working with a G-series 911, not least because there are required



Below M64 bare case 9m blueprint and rebuild features new bearings, pistons and cylinders, a custom dual outlet exhaust and a live remap of the original 964 Motronic ECU











Above Interior takes influence from the 911 Sport Classic, complete with contrasting black and chocolate leather

Below Bennett grips the MOMO Prototipo after accepting Julian's invitation to take no prisoners

modifications to the inner panels, as well as exterior metalwork. Ostensibly, though, the look requires the full 'long bonnet' conversion, including slam panel, corresponding front wings and front bumper. The rear arches are standard Carrera, the rear bumper matches that of the 911 Carrera RS Touring. The flat rear lid replaces the earlier fire-damaged item. The car left the factory with a sunroof, leading the Ninemeister team to install a new lid, effectively deleting the hole in the roof. Consider also the sills and the pipework running front to rear, essential for that authentic early 911 look. All in, a huge amount of work. Expensive, too, especially when using genuine new Porsche panels, but this is where the market is at for top-end builds right now. The colour is Dolomite Grey Metallic (LY7V for all you paint pervs), which shouts class and is entirely in keeping with a man who is also currently deep into a BMW E9 3.0 CSL restoration. Anodised brightwork and chrome door handles add a touch of bling and are all new, straight from Porsche. Custom touches, such as the gold Porsche script and gold 9m911S badge on the rear deck, are another visual diversion.

AT THE REAR, 9M'S NARROW REAR AXLE CONVERSION ALLOWS FOR THE DISH AND OFFSET OF THOSE BRAID WHEELS

So far, so authentic, but the sixteen-inch Fuchs replicas from Braid, complete with their silver anodised rims and petals, hint all is possibly not what it seems. Likewise, the red 993-derived four-piston brake calipers peeking out between the spokes.

Back to the four-wheel drive system. The standard 964 setup was pretty primitive, even if it was marketed with buzzwords like 'electronically controlled'. True, power was distributed front to rear by electronic command, but the functionality (torque split) was entirely mechanical. The front and rear differentials could be locked manually, too, which is much like a Land Rover — great if you want to get out of a muddy field, but not very 'sports car'. The system is also heavy, with a lot weight over the front transaxle. The result, particularly when drive was diverted to the front, was dreaded understeer, something the 964 Carrera 4 quickly developed a reputation for.

Under Colin's guidance, Julian and Rob put their heads together. The 993 Carrera 4 had a much more developed four-wheel drive system with a dynamic limited-slip differential, plus Active Brake Differential (ABD) as standard, not to mention a viscous, multi-plate clutch to distribute drive, which ranged from as little as five percent to as much as forty percent at the nose. In most situations, the 993 Carrera 4 was therefore pretty



much a Carrera. The system was fifty percent lighter than that of the 964 and, crucially, could be very easily retro-fitted to the 964. This, then, was the plan. By a stroke of good fortune, a Ninemeister customer wanted to convert his 993 Carrera 4 to two-wheel drive and was after the corresponding six-speed gearbox, which Rob just happened to have available. A deal was done, transmissions were swapped, and Julian's build was enhanced with both a six-speed gearbox and the 993's advanced all-wheel drive system. Not that you would guess so when eyeballing the car from the outside, which (in so many respects) is the point.

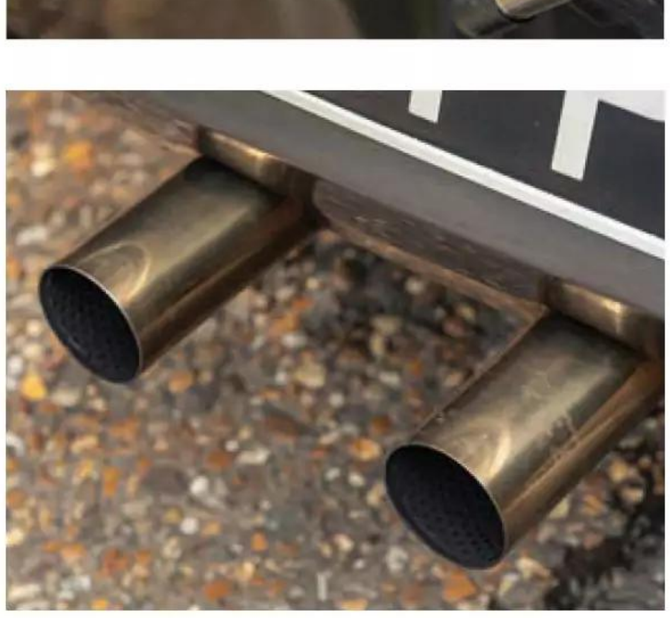
SIX OF THE BEST

Engine-wise, there is little wrong with the 964's M64 flat-six, particularly since many years down the line, any issues with leaks, dizzy drive belts and disintegrating dual-mass flywheels have all been sorted. Still, it goes without saying, a full rebuild was a given. Again, there are parts bin tweaks for easy, no-pain gain. Consequently, Rob went ahead with the fitment of 993 pistons and cylinders for what he describes as better balance. A custom dual-outlet 9m exhaust system (9m being Ninemeister's celebrated tuning arm) and matching headers equals better gasflow. Recalibration of the 964's Bosch Motronic ECU aids a power hike to 295bhp. That's a very healthy and very usable figure and is paired with oodles of torque, thanks to the 3.6-litre capacity.

Julian wasn't on the hunt for big power, in the same way he didn't particularly want a road racer. This is a subtle build with Touring touches. The chassis is therefore biased toward comfort — no polyurethane bushes or solid mounts here. Just rubber, standard top mounts and Bilstein B6 dampers with H&R springs. The aforementioned 993 calipers are part of 9m's 993 front upright conversion for the 964. Talking of brakes, Colin's team has developed a four-channel ABS system based on that of the 996, which replaces this 964's two-channel configuration. Meanwhile, at the rear, 9m's narrow rear axle conversion allows for the dish and offset of those Braid wheels. Looking back at early 964 backdates and restomods, wheels were always a concern. A flat-faced Fuchs lookalike never looked right.

A race-style interior would clearly be at odds with this build. Instead, Julian and Abbi have taken influence from the 911 Sport Classic, incorporating chocolate-colour, leather-clad D'eser vintage-style seats. The same treatment is applied to the door cards, dash centre





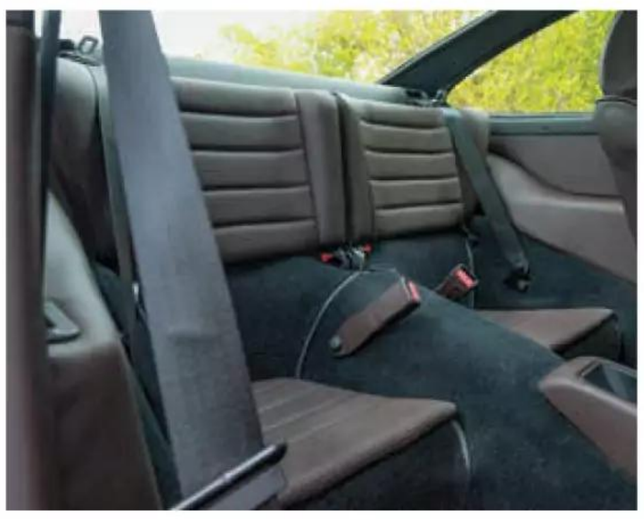


Above and below
Attention to detail is exquisite, the Ninemeister team ensuring every inch of the car was given a thorough makeover











Above Braid wheels are a convincing Fuchs replica, offering deep dish and wide fitment for applications such as Julian's 9m11s

and knee roll, as well as the 9m custom short centre console. Chocolate is offset by black leather edges for the included 993 carpets, the black leather dash top and headlining, plus the MOMO Prototipo steering wheel. Like those gold badges on the exterior, adding a touch of jewellery are the backdated green-on-black instrument dials. And, of course, the cabin wouldn't be retro-modern without a Porsche Classic Communication Management (PCCM) head unit and USB connectivity. Air-conditioning is a must have, of course, but it's also a can-have, thanks to today's popular electric air-con systems. Here, the kit is concealed under the floor of the front compartment.

It's hard, sometimes, not to make a build like this sound like a list of parts. It's always worth taking a step back to admire the finished article, which when done properly, should be *more* than the sum of its parts. Not that we expect anything else of Ninemeister builds, but Colin's team's interpretation and execution of Julian and Abbi's wishes is truly flawless and stunning in equal measure. It's also a prime example of restomod art playing out so well with the 911, plus endless permutations of compatibility. We are, after all, talking about the look of a 911 from the early 1970s, coupled with 1990s running gear (from both 964 and 993), plus a smattering of 996. So, then, how does this redeveloped 964 drive? We've yet to test anything out of the 9m stable that hasn't been anything less than impressive, plus Julian is keen we spare his car nothing. There are decent roads in today's Cambridgeshire photo shoot locale, so I guess we'd better get on with it.

THIS NINEMEISTER BUILD IS A POSITIVE BARGAIN, THANKS IN PART TO THE UBIQUITY OF THE 964 IN THE FIRST PLACE



The suspension and ride quality fetishist in me worries those sixteen-inchers (nine inches of width and the back, seven at the front, with 205/55 and 245/45 Continentals) are going to place too much strain on the suspension, but reality proves the combination is but an inch up on the standard 911 S 2.4's fifteen-inch wheels. Besides, damper technology has come on a little since the early 1970s. And, of course, there are fresh rubber bushes to insulate the ride, plus correctly adjusted Bilstein B6s. We're talking low-speed compliance, but with control as the pace picks up.

All the 911 traits, ticks and quirks are present and correct. In fact, more than this, they're amplified by the swaggering 295bhp in the tail, plus 280lb-ft torque, up substantially from the standard 229lb-ft. Power is great, but power with torque is even better, because that's what you really feel on the road. Its torque, too, that really gets

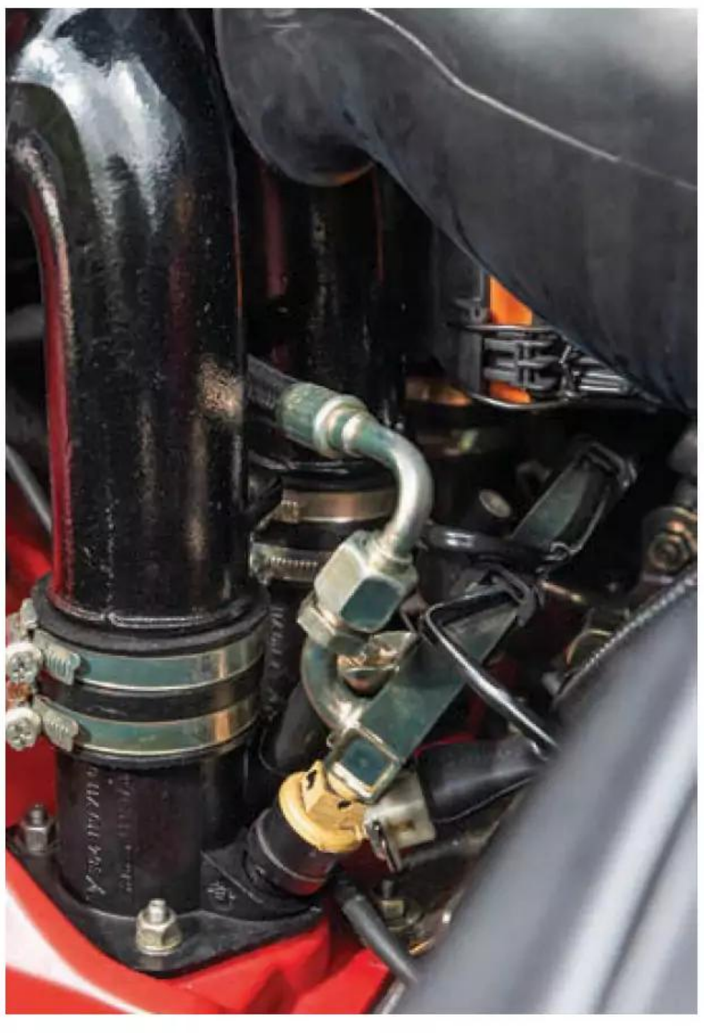
the 911 chassis working and the tail swinging. Use the power for ultimate progress and torque output joins the propulsion party. If you're not quite in the mood, however, then let the mid-range take over and cruise on the 993's six-speed transmission, which has a ratio for every occasion. Or just stick it in sixth. You can't do that with an F-series, can you?!

Talking of the 993's six-speed, true to type (that being a Getrag G50), it's a delightfully fluid and well-oiled shifter. Likewise, the clutch, which is hydraulically actuated. Other observations? Ah, yes, four-wheel drive. Kind of. What four-wheel drive?! You honestly don't feel it, such is the system's propensity to run to drive to the rear wheels. No surprise, because that's how it feels in a standard 993 Carrera 4. Maybe in the wet you could play with it a bit, but not today, in blazing sunshine and on dry asphalt.

Steering? Comparing old with new, a classic 911 S has an almost comically slow steering rack, which requires a full upper body heave to guide. Power steering allowed the modern 911 a quicker rack, more precision and a pointier front end. Clasping the thick-rimmed MOMO, there is no loss of feel or communication, just more control. These aren't observations we would normally make of a 964, but then this isn't an ordinary 964. It goes to the very heart and soul of the restomod movement, which is to have your cake and smear it all over your face. "Not another bloomin' 911 restomod," some will say. "How much?!" others will ask, but this isn't simply another 911 restomod. It's uniquely Julian and Abbi's 911 restomod, and there isn't any other quite like it, which is the whole point. To his credit, Julian isn't shy talking about cost, which including donor car, amounts to £250,000. Pricey? Not when you consider what has gone into this nut-and-bolt rebuild. Indeed, in a world where a 911 SC restoration can very easily be getting on for £150,000, this Ninemeister build is a positive bargain, thanks in part to the ubiquity of the 964 in the first place. And don't worry, of the near sixty-three thousand 964s Porsche built, there are still plenty left.

Finally, as demonstrated across this special bookazine dedicated to air-cooled restomods, the 964 is having its day, which is what it thoroughly deserves, not least because it's the last air-cooled 911 with a tangible link back to Porsche's original 911 design. This is largely thanks to the restomod scene, which has endorsed the 964's underpinnings as being, y'know, really quite good. Just ask Colin Belton and the 9m team. ✪

Above Only informed guesswork would have you believe this superb 911 started life as a 964 Carrera 4







TIME MACHINE



Imagine if... you could take all of the performance we now expect from modern sports cars then go back in time and apply it to your favourite classic 911, well, that's precisely what we do. ***9m*** Cars are; *faster, more responsive, safer, tougher, a joy to live with* and most importantly, as original as the classics on which they are based.

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IMITATION GAME

Hot on the heels of EB Motorsport's stunning 911 R homage, the company's Carrera RSR Turbo 2.1 replica is a Porsche passion project delivering many new historic race car components to market...

Words **Dan Furr** Photography **Chris Wallbank**

We recently celebrated the G-series 911's fiftieth anniversary, meaning it has been five decades since the 911 Turbo was unveiled. Prior to the series production 930 landing in Porsche dealer showrooms, however, the first turbocharged 911 was the Carrera RSR Turbo 2.1 race car, which also served as the first turbocharged 911 to compete at Le Mans. Only four examples of this phenomenally engineered Porsche were produced. Perhaps even more astonishing is how R13 (chassis 911-460-9102), the final of the four RSR Turbos built, managed to survive its motorsport career and the subsequent decades without sustaining any serious damage or structural corrosion.

A CUTTING-EDGE 911 COMBINING ALL OF PORSCHE'S ENGINEERING AND TURBOCHARGING KNOW-HOW IN A GIANT-KILLING PACKAGE

When it comes to performance road cars, Porsche and turbochargers proved themselves a perfect pairing, but it's worth remembering the manufacturer's success with turbocharging started at the race circuit. Specifically, one can chart Porsche's experiments with snail-shaped bhp boosters to the 917, a sports prototype based on the 908 and developed to achieve top honours at Le Mans. Introduced in March 1969, the twelve-cylinder, 520bhp behemoth would go on to be revered as one of the most important race cars of all time.

In both short- and long-tail guise, the distinctively styled Porsche scored countless victories, not least the Stuttgart brand's first overall triumph at Le Mans, a win scored in 1970 and considered Porsche's most important motorsport success — it can be argued the Salzburg-liveried, Herrmann-and-Attwood-driven racer kick-started Porsche's incredible dominance of sports car racing. In fact, a magnesium-framed development of the 917 won at the following year's daylong enduro at Sarthe, exactly twenty years on from the manufacturer's first showing at the event. What is it people say about buses?!

Though the story hasn't been widely publicised in recent years, the 917 held the lead for ninety percent of the 1969 event, one of the most exciting stagings of the 24 Hours of Le Mans to date. Sadly, thanks to transmission troubles, both works cars retired in the twenty-second hour of the race. The third 917, entered privately by John Woolfe, crashed on the opening lap, killing him in the process. This awe-inspiring (if somewhat wayward) Porsche was clearly a force to be reckoned with and, as 1970 and 1971's outings at Le Mans proved, was earning a reputation for being unbeatable, so much so motorsport's governing bodies were twitching in their seats. Consequently, regulations were introduced favouring cars with engines possessing three litres of displacement (the smallest 917 engine was 4.5-litres), a move designed to entice manufacturers building three-litre F1 engines to enter the world of endurance racing.

In response to the altered rulebook, Porsche focused its attention Stateside, entering the Canadian-American (Can-Am) Challenge Cup in 1972. With fewer rules than were being dished out in Europe, not to mention a lack of enforced limit on displacement, the 917's Type 912/00 engine (named after the lowest-powered Porsche in production at the time of the 917's introduction, a move rumoured to be a way of disguising the true nature of the beast) grew to 5.4-litres, with power output of 660bhp. This was, however, was just the start.

Porsche engineers, Hans Mezger and Valentin Schäffer, developed a sixteen-cylinder version of the engine producing 760bhp, but the host 917's chassis had to be extended to accommodate such a massive powerplant, which negatively affected the car's handling. A turbocharged twelve-cylinder engine was subsequently developed under the watchful eye of factory motorsport chief, Ferdinand Piëch, and head engineer, Helmuth Bott.

This wasn't the first time Porsche had looked to turbochargers for extra 'get up and go'. Ferdinand Porsche had, in fact, bolted turbochargers onto sixteen-cylinder diesel-fed tank engines many years beforehand. Even so, the twelve-cylinder 917 represented the first time the sports car manufacturer bearing his family name had used a turbocharger to achieve truly prodigious performance. Initial results, however, were poor. Massive, uncontrollable boost, plus the very real danger of mechanical failure causing a fire, gave cause for concern. These teething problems were solved by diverting unwanted gas through a wastegate, enabling the Penske Racing 917/10 short-tail to take Can-Am spoils with 850bhp at its disposal, breaking McLaren's five-year dominance of the competition as it did so.

Powered by a 1,580bhp flat-twelve, the 917/30 of 1973 was a revelation. Driven by Daytona and Indianapolis stalwart, Mark Donohue, it decimated the competition. The year's global oil crisis, resulting from the Organization of Arab Petroleum Exporting Countries (OAPEC)

Facing page Martini body graphics are a perfect replication of original decals, a level of accuracy not even original RSR Turbos are necessarily sporting



Above RSR Turbo rear windscreen angle was altered to help channel air to the massive rear wing and to the intercooler below it

implementing a complete oil embargo against countries supporting Israel during the Yom Kippur War, encouraged series organisers to introduce a limit to the amount of fuel expended by participating cars. Additionally, there was real concern about excess levels of combustible gas leading to exploding fuel cells. The change pretty much outlawed the 917/30 for the 1974 season, although various privateer teams backdated their 917s with normally aspirated engines in a desperate bid to qualify for inclusion in a series McLaren had quit in favour of renewed focus on Formula One and the Indy 500.

Porsche had ably demonstrated its ability to harness and refine turbocharging technology. Indeed, the 917/30 was the most powerful sports racing car ever produced, delivering 1,369.68bhp per tonne. The 917/10, meanwhile, won the 1973 European Interserie. There was, however, uneasy talk in Zuffenhausen's corridors — members of Porsche's executive board were worried about the spiralling costs of the company's motorsport programme and also the fact showroom customers were increasingly unable to make the connection between what the manufacturer was doing on the track and the products it was offering in dealerships.

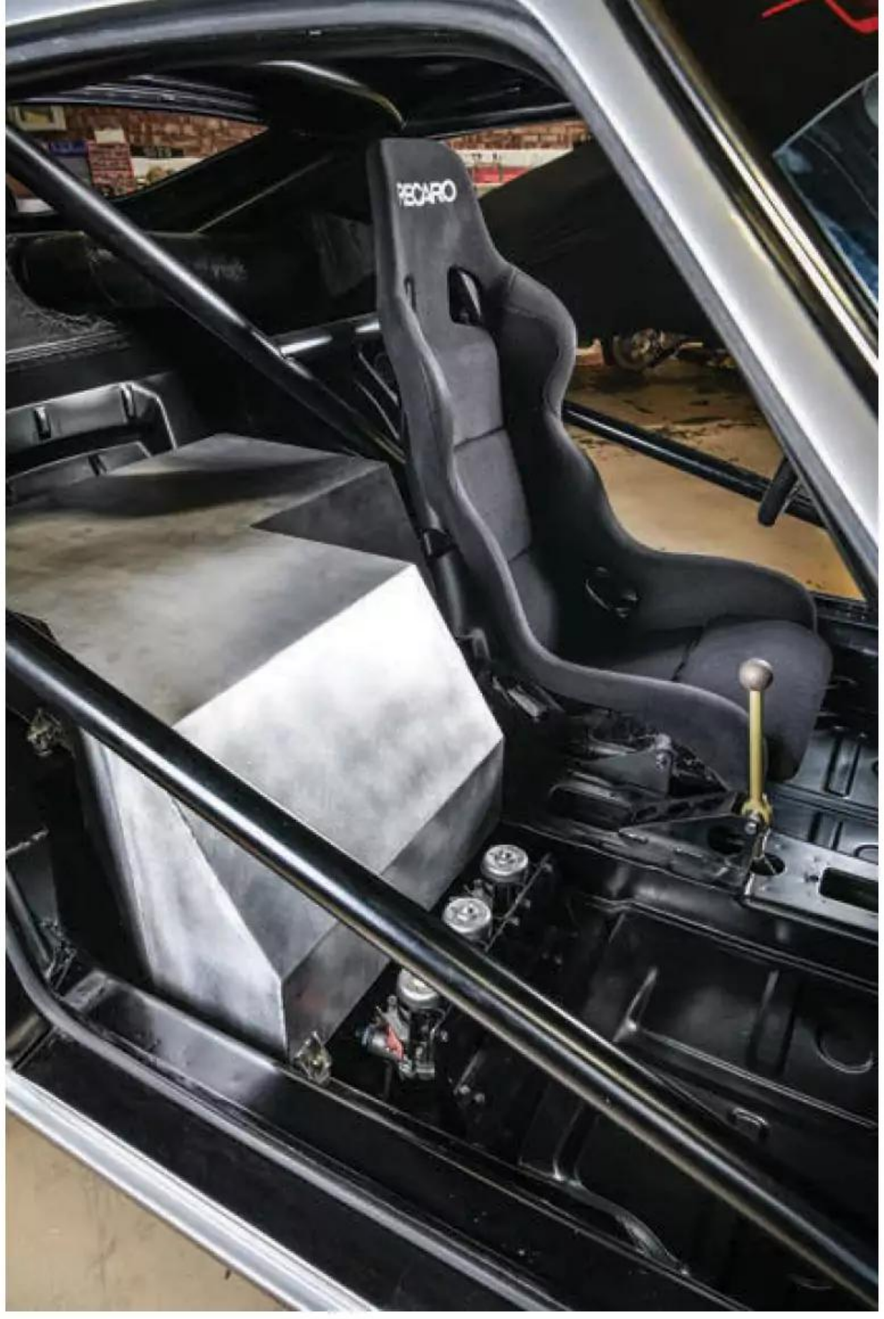
The FIA's altered Group 5 racing rules mirrored Group 6 prototype regulations insofar as engines were limited to three litres of displacement, but also by requiring no minimum series production for homologation of competing cars. In light of the 917 living on borrowed time, Porsche's then CEO, Ernst Fuhrmann, decided to reintroduce the 911 to top-tier sports car racing. The result was the Carrera RSR Turbo 2.1, a cutting-edge 911 combining all of Porsche's engineering and turbocharging know-how in a giant-killing package. "The precursor to the 934 and 935. A road car capable of beating the most advanced prototypes of the era," as Mark Bates of EB Motorsport succinctly describes it. Fuhrmann saw the RSR Turbo as a means of assisting with the development and marketing of the 930 road car in advance of its planned launch for the 1975 model year.

The revised Group 5 rules had the effect of pitching the RSR Turbo in with prototypes, including the V12-powered Matra-Simca MS670C, but Porsche was supremely confident in its new racer, which shared much of the G-series road car's silhouette, but carried over many parts from the outgoing 917. "A staggering amount of development work, which is why it took so long for us to build a faithful replica," Mark gasps. In order to encourage a level playing field with normally aspirated cars on the grid, the FIA applied a multiplication factor of 1.4 to the displacement of turbo engines, hence the use of a 2.1-litre flat-six in a category permitting up to three litres of cubic capacity.

THE RSR TURBO WAS NOTICEABLY WIDER THAN WHAT CAME BEFORE, DESPITE BEING ONE OF THE LIGHTEST 911s MANUFACTURED

At first glance, the RSR Turbo looked much like the earlier Group 4 Carrera RSR, a consequence of both models wearing silver paintwork and Martini Racing livery, but tell-tale signs of the later 911's identity were there for all to see. The RSR Turbo's massive rear wing, for example, replaced the 'Mary Stuart' adornment on the back of RSR, while intake ducts housed in solid panels appeared in place of the rear side windows. Interestingly, this same design has been applied to the recently launched 718 Cayman GT4 RS.

The RSR Turbo was also noticeably wider than what came before, despite being one of the lightest 911s manufactured. Tipping scales at a mere 820kg, the car made use of fibreglass body panels, polycarbonate windows and a reprofiled rear screen angle designed to optimise airflow toward the 'ironing board' rear wing





Above Fuel cell was moved from the 'frunk' to the cabin, taking up the space usually afforded to the rear pews and front passenger seat

Below Additional intakes can be seen in place of rear side windows, a design inherited by the 718 Cayman GT4 RS

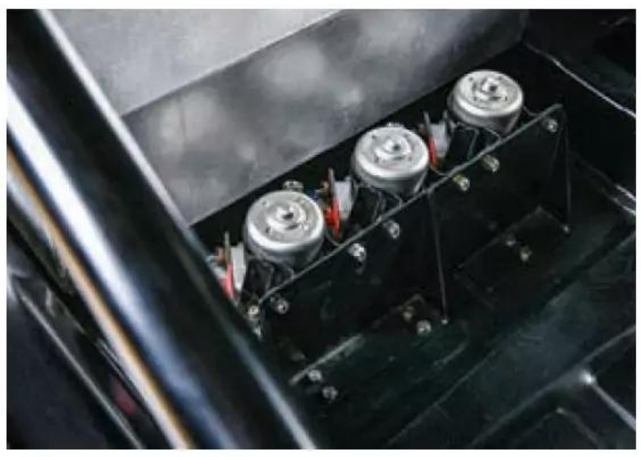
and intercooler, the latter linked to a flat-six making use of various components from the Porsche parts bin, including a 908-sourced oil cooler.

A lone KKK turbocharger and mechanical fuel injection helped the 2,142cc magnesium-cased boxer to realise 500bhp near 7,600rpm. As you'd expect, uprated camshafts and forged internals (including aluminium pistons and titanium connecting rods working together inside Nikasil-coated liners) were key ingredients, but less known is the fact Porsche mounted the engine's cooling fan horizontally, a move intended to promote increased airflow around a decidedly cramped engine bay.

The late-specification 917's locked axle joined a Type 915 gearbox and an RSR clutch, while the fuel cell was relocated from the front of the car to the cabin. The part was shaped to occupy the space occupied by rear seats in a standard 911, as well as the void where the passenger seat would normally reside. The shape and positioning of the tank was designed as a response to the car's constantly reducing in-race weight (due to fuel usage) and a desire for it not to have a negative impact on the car's driving characteristics. The RSR Turbo's weight was therefore heavily biased toward the rear.

Independent suspension in all four corners comprised Bilstein coilovers and titanium springs, complemented by adjustable anti-roll bars. The RSR Turbo's brakes were a carryover from the RSR, as were the instantly recognisable five-spoke wheels. Both sets of equipment could trace their origins to the 917. Speaking of which, at Le Mans, the RSR Turbo was able to reach more than 186mph, accelerating from rest to 62mph in little more than three seconds, the result of bucketloads of torque and the sheer thump of forced induction working its magic on the formidable flat-six. The 935 would, of course, go on to steal the limelight, but not before R13's star turn at Le Mans in June 1974, where Müller and van Lennep covered 332 laps, pipped to the post by Henri Pescarolo and Gérard Larrousse's Matra after starting seventh on the grid. The next-placed Porsche (a privateer RSR driven by Bernard Chenevière, Peter Zbinden and Michel Dubois) finished seventh. Considering R13 lost the use of fifth gear during the race, its podium finish is especially impressive.

As the works entry for the 1974 World Championship for Makes, R13 contested not only Le Mans, but also the year's six-hour race at Watkins Glen, held a month later. Starting from fourth on the grid, Müller and van Lennep worked together to achieve a second-place finish, before going on to contest the Le Castellet 1,000km (seventh overall) in August and the 1,000km of Brands Hatch (a fifth-place finish from tenth on the grid) in September. This was a time when Porsche saw little value in keeping what it regarded as obsolete race cars, meaning R13 — along with a further two of the four RSR Turbos — was sold into private ownership. Thereafter, the car was driven by Danny Ongais, George Follmer and Ted Field under the Interscope banner for the 1977 24 Hours of Daytona (generating a regrettable DNF thanks to a failed piston, despite a promising start from sixth on the grid) and took part in the same year's Mid-Ohio three-hour race, where









Follmer shared driving duties with Howdy Holmes for Vasek Polak Racing.

Fast-forward to the present day, and R13 is a true survivor. Returned to Martini Racing livery, the car was offered at Gooding & Company's 2018 Amelia Island auction with a price reflecting its status as one of the most important Porsche motorsport machines in existence. As we now know, the lower estimate of six million dollars proved too punchy, resulting in the car failing to sell. We won't shed a tear — its subsequent transportation for work at a historic Porsche motorsport specialist in the UK gave Mark and his team the opportunity to eyeball every inch of the car in pursuit of his dream of creating an entirely faithful RSR Turbo replica. We should state, we're not talking about looks alone — every component on the car you see in our photographs has been faithfully manufactured in exacting detail and, almost without exception, makes use of materials matching Porsche's efforts in period.

Even with EB Motorsport's unrivalled component tooling and manufacturing capabilities taken into consideration, this was no easy task. Remember, there were only four RSR Turbos produced, and three of the quartet were sold into private ownership, whereupon they were subjected to alterations not limited to livery — in years subsequent to Porsche releasing the cars to pastures new, changes to racing regulations encouraged updated vehicle specification. In other words, even with sympathetic restoration in recognition of today's historic motorsport events, it is difficult to tell whether a former works race car is configured entirely as it was when new.

The main thing to consider is the fact an RSR Turbo looks like a 911, but is almost entirely different beneath the skin. "The suspension pick-up points are at odds with the 911 road car," Mark shrugs. "The half shafts are manufactured from titanium. There's a specialist fuel pump at play. The steering column is aluminium with a titanium shaft. The floorpan is different. Lot of parts were taken from Porsche's prototype racers — you can't really describe any of it as standard equipment." So great was the challenge in building a facsimile of an original RSR Turbo, Mark was told not to bother by renowned Porsche engineer and former works racing driver, Jürgen Barth. "He said there simply wasn't enough information available in the public domain for anyone to build an RSR Turbo replica capable of securing an FIA Historic Technical Passport and therefore conforming to the organisation's requirements for historic racing, which was always the goal of this project."

HAND-FINISHED DETAILS, FROM BESPOKE BRAKING COMPONENTS AND 906-STYLE INLET MANIFOLDS, TO THE FIRM'S OWN DOORS

The EB Motorsport team's skill and determination had already been put to the test during the build of the company's celebrated 911 R homage. As we described in a recent issue of *Classic Porsche*, this ambitious project marked the fiftieth anniversary of the 911 R's record-breaking 20,000km endurance run, where the model clocked average speed of 209km/h in Monza, Italy. "We started with a short-wheelbase 911 from 1967, the year of the 911 R's famous sprint," Mark confirms. "The car was a real mess when we received it in 2013. It was riddled with corrosion and almost beyond saving, but across the course of four years, our in-house team carried out a fastidious restoration."

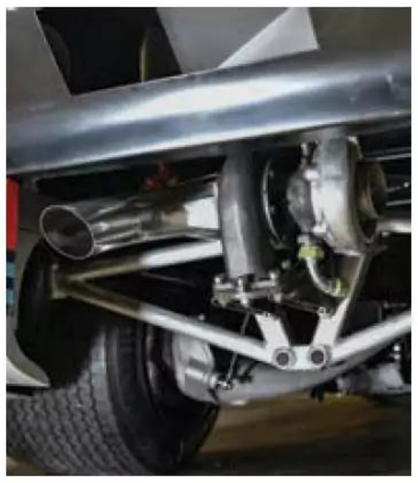
Loaded with hand-finished details, from bespoke braking components and 906-style inlet manifolds, to the firm's own lightweight doors, wheel arches, bumpers and exhaust system, development of the 804kg EB

Above Thousands of hours of research and development have been invested in bringing the car to fruition, work resulting in bringing a selection of previously unavailable historic 911 race car components to market





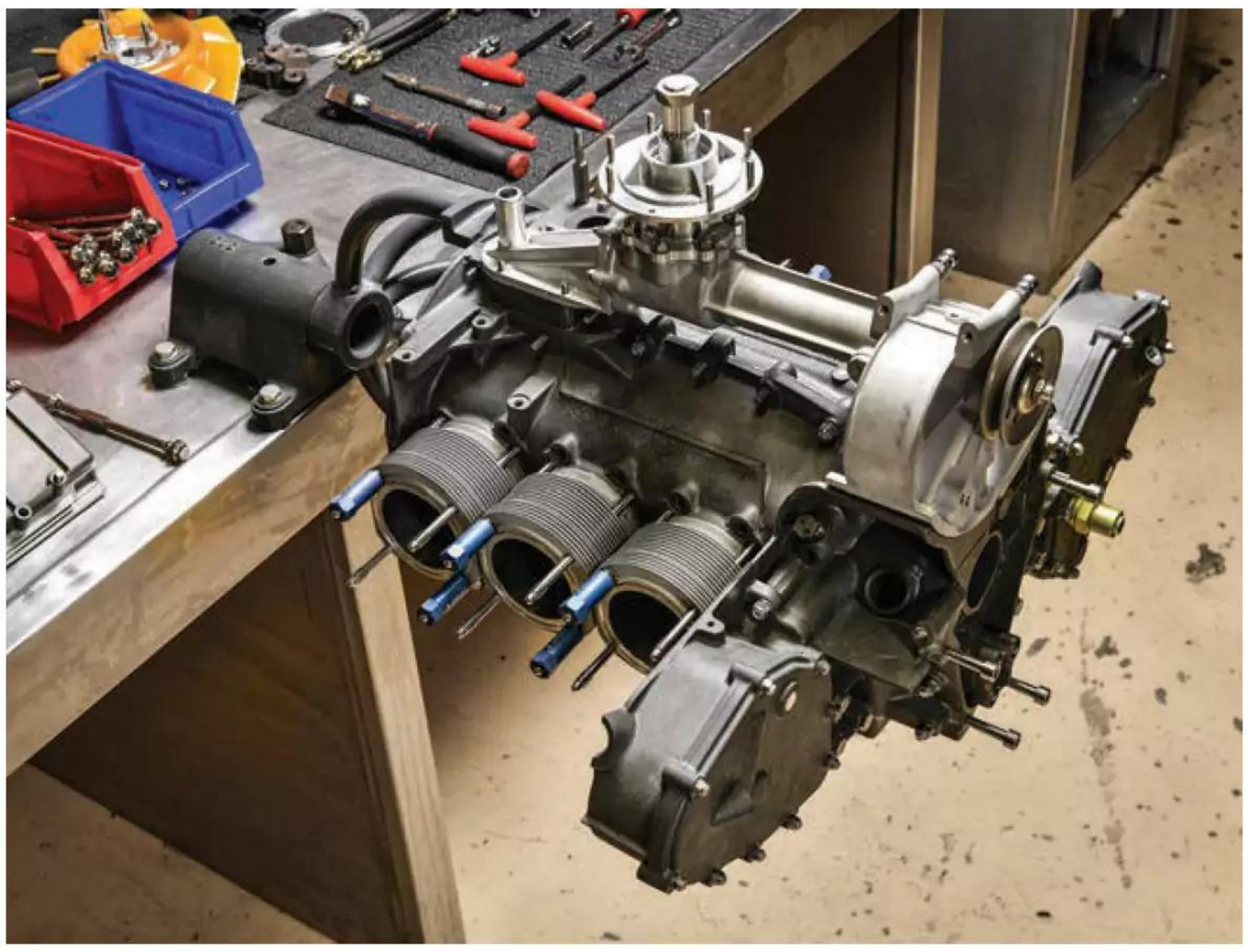




Above and below The fourth of the quartet of original RSR Turbos built (R13, the example finishing second at the 1974 24 Hours of Le Mans) was used as a point of reference for EB Motorsport's ambitious Porsche project

Motorsport 911 R necessitated the production of many unique components, which were swiftly added to the company's parts catalogue. In doing so, Mark and James were allowing other passionate Porschephiles to build their own interpretations of this most legendary of 911s.

"It took an exceptionally long time to research, source, design and fabricate all the parts we needed to build a faithful replica," Mark highlights. "Luckily, we had a customer who owned an original 911 R. We spent many months exchanging information about the details of various components. These conversations allowed us to create new parts matching period specification." The RSR Turbo project, however, was on another level altogether. "I was adamant every part of our car needed to be an exact match for the RSR Turbo's corresponding factory component. Every titanium fastener, for example, had to be a perfect clone of a factory part. Obviously, this meant we had to build a big knowledge base."



Referencing period documentation and thousands of photographs, as well as having conversations with Porsche engineers and racing drivers associated with the RSR Turbo when new, yielded much of what the team required, but access to R13 was by far and away the most valuable resource at Mark's disposal. "The car moved into a private collection, which I had a route into," he explains. "This gave my team the opportunity to spend hundreds of hours profiling every millimetre of a genuine RSR Turbo, thereby allowing us to create accurate exterior panels for the replica. That said, it took us a year to finalise our 911's bodywork. You have to understand, we need to manufacture the tooling required to make the parts before we can begin production. All the while, we have customer projects on the go."

It took two years just to find a period-correct turbocharger to work with. The calipers were another crucial component for the team to get right. Based on the 917's original cast calipers, they were reshaped for RSR Turbo usage, holding a deeper pad with more friction material. Cooling fins were oriented transversely (rather than vertically), making them a part easily recognisable, but complicated to replicate. "Casting can be unreliable and produces much in the way of wastage," Mark explains. "This is why, to produce our version of this particular 917 caliper, we used state-of-the-art software to accommodate scanning, digitisation and design processes before the final part was made from a solid billet of aluminium in a five-axis CNC machine overseen by a skilled operator." To complement the billet bodies, EB Motorsport machined caliper pistons from aluminium, while the rest of the fixtures and fittings, such as the crossover pipes and bleed nipples, are machined from solid titanium. The company even makes its own handbrake mechanisms and brake pads.

"Of course, making a part complying with FIA regulations is one thing, but having it look period-correct is another. In the example of the calipers, we had to give them the appearance of the original cast items to



ensure they didn't look out of place when fitted to the car." The rear wing, meanwhile, presented a challenge of its own. "It's huge," Mark laughs. "We designed it in CAD software, but on account of its size, we needed to seek the assistance of a film set manufacturer to help bring the blueprint to life. Obviously, we couldn't remove parts from R13. It was therefore hugely important to make sure our reference points were spot-on."

The car's rear trailing arms are aluminium. Moreover, with the help of a Celette jig, the entire rear suspension 'horseshoe' comprises lightweight tubework. "The sheet metal fabrication on the original RSR Turbo is staggering, but we've replicated all of it," Mark stresses. Parts deviating from original specification are few and far between, but include the roll cage — in the interests of driver safety, the EB Motorsport replica's roll cage is manufactured from T45 steel tube, whereas R13 would have been equipped with softer aluminium scaffolding.

"It would be very difficult to complete a project of this magnitude without the ability to design, tool and fabricate parts in-house," Mark concedes, referencing engine items not limited to the RSR Turbo's cylinder heads, valve guides and camshafts, all of which were perfectly replicated for this build. Even the car's paintwork is period-perfect, a result of Mark sampling colour from an unrestored RSR body panel and mixing the exact same shade of silver, which was applied by way of the two-stage base-and-lacquer process adopted by the works team in the early 1970s. This dedication to accuracy extends to the shifter mechanism, the specialist gear set, the 'flat' engine fan ("a big project in its own right"), driveshafts, dash dials, all of it. "I began to wonder if Jürgen Barth was right," Mark smiles. "The amount of time and energy we have invested in this project is huge. Much of it has been dedicated to research. Barth was correct insofar as there is very little information available relating to the RSR Turbo's original specification. Worse still, much of the data we came across is incorrect. Fortunately, we were involved in the restoration of a 936, which helped us reverse-engineer parts used in RSR Turbo production, thereby allowing us to observe correct designs and tolerances. Even so, this was no easy build."

The door handles might look metal, but they're plastic, just as they were on R13 and its siblings. "We had to scan and reproduce the original parts, including the push button mechanism," Mark reveals. "The light lenses are standard, but the bowls are custom. The steering rack isn't anything unusual, but it mounts to the monocoque. You can't just go to a Porsche Centre and buy the required parts. They have to be made from scratch." This is a good point well made — owners of historic racing Porsches, as well as enthusiasts building replicas, have long struggled to find parts for repair or appointment, but EB Motorsport projects, such as this, introduce brand-new componentry to market.

A LIMITED NUMBER OF RSR TURBO RECREATIONS ARE AVAILABLE TO ORDER AND WILL BE DELIVERED READY TO RACE

Not that this amazing replica is a money-making tool for the business. "We're going racing in this car," Mark confirms. You can, too. Kind of — a limited number of EB Motorsport RSR Turbo recreations are available to order and will be delivered ready to race. And in case you need further convincing of the attention to detail lavished on the 911 you see on these pages, consider the fact Gijs van Lennep, the man who drove multiple RSR Turbos in 1974, including R13 at Le Mans, thought he was looking at the real deal when he examined our star car at a show last year. EB Motorsport, we salute you. ✪

Above The RSR Turbo's release into the wild coincided with launch of the 911 Turbo (930) road car, allowing Porsche customers to make a direct connection between what they saw in showrooms and what Porsche was campaigning on the world's race circuits

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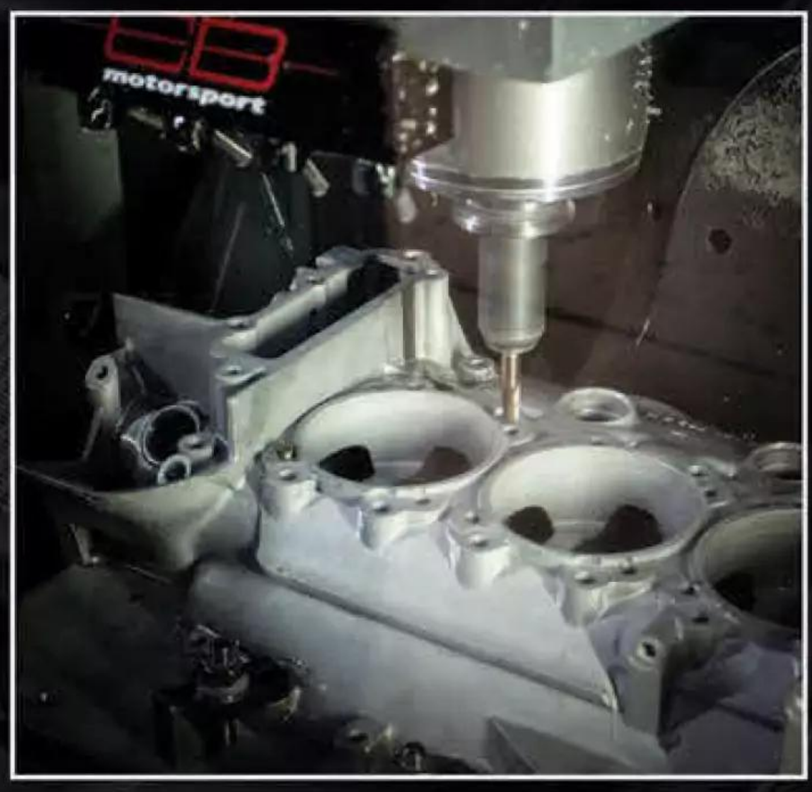
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SILVER MACHINE

This is a project started twenty-eight years ago and swallowing almost £200,000 in the process. It was once a humble 1972 914, but is now a 916-inspired mutant, complete with crushing 993-derived power and performance...

Words **Steve Bennett** Photography **Ade Brannan**

Admittedly, I am a little distracted. It's been a bit of a mad day. Editor Furr, being the hard taskmaster that he is, has already had myself and demon lensman, Ade Brannan, despatched to Bicester Heritage to shoot and drive a short-wheelbase 911 S. A first-world problem, I agree, but Furr is insisting we squeeze in another shoot, this time at the Cranfield headquarters of independent classic Porsche sales and restoration specialist, Export 56. It's always a pleasure — never a chore — to catch up with company founder, Mick Pacey, as well as his right-hand man (and son), Ben, but traffic has been a bit, y'know, and we're running later than anticipated. Oh, and what is it we're driving again? "It's a 916," says Mick. And so it is, but not quite as we know it.

If I'm not quite focused on the job soon to be at hand, Mick's offer to start the car and reverse it out of the Export 56 workshop rather does the trick. Flicking the battery cut-off switch, he primes the fuel pumps the throttle and spins the flat-six. It catches with a mighty explosion of air and fuel, and Mick brap, brap, braps it out into the mid-afternoon sun. Blimey, this thing is bloomin' loud. It looks familiar, with its pumped-up arches and fat Fuchs. As it should, because we've been here before, back in 2008, with our sister magazine, *911 & Porsche World*.

Back then, this boxy Porsche was very much the culmination of a project taken on and then commandeered by Lincolnshire-based marque indie, Gantspeed. It's a car that had been ten years in the making. Truth be told, it's evolving to this day — subsequent owners have stamped their own take on what is a restomod Porsche from a pre-restomod time. Indeed, in 2008, we described this silver machine as merely a 916-inspired look-alike or recreation. Then as now, it's rather more than that.

Where to start? Well, with a little history lesson I guess, because we need to understand the inspiration and influence behind the pumped-up look, the 914, the 916 and even the 914/8. Confused? No need to be.

We all know the basics. Conceived with Volkswagen and introduced in 1969, the four-cylinder 914 replaced the 356-engined 912 as an all-new model, badged variously as Porsche or VW-Porsche. Crucially, the 914 was mid-engined, which was, of course, very different from the rear-engined 911. This was a good thing, since mid-engined sports cars were very thin on the ground. Affordable mid-engined sports cars? Even thinner. The quid pro quo to the rather exotic, race-bred layout was what Volkswagen was bringing to the party, which was the motivational 1.7-litre four, dishing out a stingy eighty ponies.

WHILE THE PRANCING HORSE WAS A THING OF BEAUTY, ONLY THE PORSCHE'S MOTHER COULD REALLY LOVE ITS LOOKS

We need not concern ourselves too much with the basic 914. Keen to mess about with what could potentially be a very effective machine, the 914 spawned the 914/6, with 110bhp of two-litre 911 T power. In this guise, some 3,320 cars were built (partially trimmed bodies from Karmann were wheeled down the road to Porsche for the engines and Type 901-based gearboxes to be fitted) up until 1972. In this six-cylinder guise, performance-wise, the mid-engined car was much more of a Porsche, but despite the racer configuration, it never made it as a competition car in the same way the 911 did before or after, although some might say Porsche didn't actually want it to. Sixth overall at Le Mans in 1970 (Guy Chasseuil/Claude Ballot-Lena), however, was none too shabby. A 1-2-3 on the testing and exhausting Marathon de la Route at the Nürburgring, as well as third on the 1971 Monte Carlo Rally — the latter with Björn Waldegård and Lars Helmar at the controls — were peaks in a short motorsport career.

Waldegård, however, wasn't a fan of the 914 in rally specification. "The engineers at Porsche thought this was the ultimate sports car because it had 50/50 front-to-back weight balance. I believed them until I drove it. They were wrong. It was impossible to drive, so nervous. With the 911, you knew when the back end was going in a nice slide and you could control it. By comparison, the 914 was very unpredictable." A personal preference to the 911 from the big Swede? Possibly. It is certainly fair to say mid-engined has always been more of a track-biased setup. Porsche's engineers persisted, even if others within the company weren't quite so sure.

Whether he wanted one or not, Ferry Porsche was presented with a 914/8 (created by fitting a detuned version of the three-litre, flat-eight from the 908 race car) for his sixtieth birthday. For whatever reason, another 914/8 was built for Ferry's nephew, Ferdinand Piëch. It wasn't even his birthday. Both vehicles were conceived as road cars and never saw competition use.

The 914/8 got no further, but the six-

Facing page A long time coming, this heavily modified 914 is currently being offered for sale through Export 56

cylinder theme was further explored with the 916 and considered for production as a rival to the Ferrari Dino for the 1972 model year. A total of eleven prototypes were built, but the project was cancelled when the sale price was estimated at being fifty percent more than the 911 S. What actually constituted a 916, though? Starting with the basic 914 bodyshell, Porsche welded shut the Targa roof panel to increase torsional rigidity, then added distinctive, bulging wheel arches and an aerodynamically optimised front end with centrally mounted oil cooler.

INCREASED CAPACITY

While the 914/6 had just two-litres of flat-six power, the pukka 916 was conceived with the 190bhp 2.4 S engine from the 911 and the five-speed 901 gearbox. Suspension-wise, the 916 utilised the same suspension setup as the 914 (struts and torsion bars similar to the 911 at the front, unique coil spring struts at the rear), along with front and rear anti-roll bars. Ventilated 911 S disc brakes were fitted in each corner.

Had it gone into production, there's no doubt the 916 would have been sensational, albeit sensationally expensive. Kerb weight at 1,000kg was seventy-five kilos less than the 911 S. Moreover, Porsche's performance figures put the 916's zero-to-60mph time at less than seven seconds, coupled with top speed approaching 150mph. From this point of view, the 916 would certainly have rivalled the Dino, but while the Prancing Horse was a thing of beauty, only the Porsche's mother could really love its looks.

Hang on a minute. Isn't this part of the 914's appeal? Its 'push me, pull you' styling is decidedly leftfield and the wide stance is both practical (in terms of accommodation and storage) and great for handling. Porsche may have got cold feet over racing the 914/6, who quite knows what the 914/8 was for, and the 916 would have embarrassed the 911, but there were plenty of folk who absolutely 'got' the 914, particularly in its largest export market, that being the US, where the square-edged Porsche enjoyed a lengthy competition career in SCCA events, particularly in the modified classes.

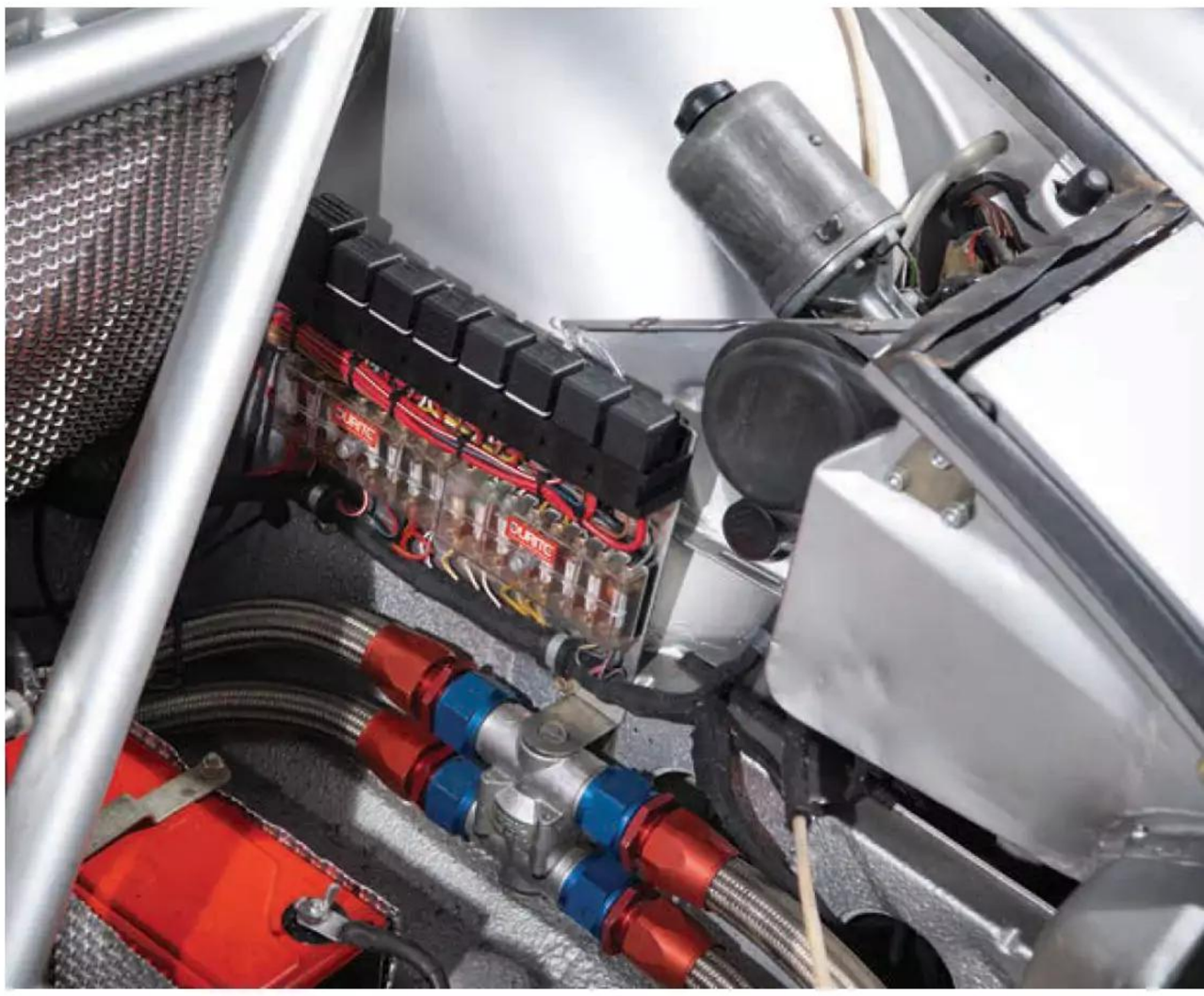
Modified? Time to get back to the job in hand and this ex-Gantspeed 916 recreation shaking the ground. Replica? Well, no, not really. It's more *mutant* than replica, but in a good way. This is certainly in no way even close to the specification of the aforementioned 916 prototypes.

Back when we encountered this car many moons ago, the story went something like this: customer and 914 enthusiast brings car to Gantspeed's workshop in Mareham le Fen, Lincolnshire, for a bit of light fettling. Light fettling escalates into full

Above and below
Every aspect of the car has been comprehensively overhauled







Above and below £115,000 buys you this 916 evocation, which is considerably less than it would cost you to build the same car today

restoration. Restoration begins to get out of hand, both in terms of time and finances — the extent of the base 914's issues become apparent. Reality check takes place.

As Robert Gant recalls, "it really was a quite horrible thing. It was a pretty grotty 914, as many of them are, with nasty fibreglass bubble arches and poor-fitting bumpers. A 2.4-litre 911 T engine was in place. We inspected the car and discovered it needed a lot of work. We took the engine out to replace the clutch and found a lot of corrosion in the engine compartment, where the battery had leaked onto the chassis rail and rotted the chassis leg and inner wing. This 914 was rolling on five-stud wheels hiding 911 front brakes, which was fine, but the rear hubs and driveshafts had been cobbled together. The more we got into it, the more problems we found." Meanwhile, the car's enthusiastic owner had his head turned by some of the inspiring 914 racers in the USA, many exhibiting modifications as wild as Chevy V8 conversions. That would have been a bridge too far, but a Carrera RS 2.7 engine? Such things were not quite precious in those days.

"It just so happened we had a genuine RS engine, which was surplus to requirements," Robert continues. "The customer agreed we'd rebuild the unit and it could go in his 914. It turned into a seriously expensive build. We fitted new heads and sourced the correct sheet metal wrapping itself around the engine. We also installed a complete stainless steel exhaust system." The car's owner was worried the Type 901 gearbox would not withstand the new engine's power and torque. Patrick Motorsports is the go-to 914 expert — and has recently restored one of the original 916 prototypes — and supplied an as-new Type 915 gearbox from a late Carrera 3.2, complete with a 914/6 end casing and appropriate side-shift mechanism. Robert and the Gantspeed gang then took a more serious look at the bodyshell. "We kept pulling bits off. We removed one of the wheel arches and the steel behind was rotten. The floorpan was rotten, too. We got to the point where I said the body needed to be stripped to a bare shell, sandblasted, corrosion cut out and new steel parts, including wide wheel arches, fitted."

The owner concurred, but insisted a roll cage be fitted for competition work. To make the body super-rigid, Robert suggested the cage should be fixed to as many suspension pick-up points as possible. The owner agreed and also approved the appointment of new front and rear 914/6 GT aprons obtained from the USA, plus Carrera 3.2 brakes, Bilstein front struts and matching coilovers. The decision was also taken to redesign the dry-sump lubrication system, with an oil tank at the nose and a larger cooling radiator in the front spoiler.

At this point, the project was four years in and the customer had been paying as the job progressed, but he hit the financial wall, having invested circa seventy grand. Ouch. Imagine what that figure would be if the project was commissioned today. Trying to sell





Above Bennett enjoys time in the hot seat of this Gantspeed-built air-cooled classic

it as a seventy-percent-finished build failed, hence Gantspeed stepping in to relieve him of the burden. “I’d grown fond of this car,” Robert smiles. “It had been an interesting project, and I could see it was going to end with a really special 914.” Even so, as Gantspeed accommodated work around other projects, it was a further six years (and a further £128,000) before the 916 recreation was on the road and took its star turn in *911 & Porsche World* magazine.

It goes without saying, but putting everything back together took some time. A new wiring loom went in, along with a lightweight battery in the nose. The interior was totally re-trimmed and much effort was expended on getting the front and rear bumper sections sorted. The 916 items expensively imported from the USA turned out to be a poor fit and had to be totally re-engineered at Gantspeed using new moulds, a process taking twelve months, all told.

The result? Well, as Robert admitted at the time, the way the car was built perhaps limited its appeal. It’s not a full 916 replica, meaning it can’t claim the FIA papers needed for historic motorsport. “It’s a bit of an oddball, really. We didn’t sit down at the start and lay down exacting specification. It evolved as it went along, but we think it’s a better car than the original 916 because our build has been further developed.” Interestingly, when Gantspeed weighed the car in its finished state, it tipped scales at 1,018kg, a tad heavier than Porsche’s proto-916, the extra weight probably accounted for by the roll cage.

FURTHER TWEAKS OVER GANTSPEED’S CONFIGURATION INCLUDE TUTHILL SIX-POT BRAKE CALIPERS AND A WEVO SIDE-SHIFTER

What did we think at the time, though?

With Eurofighter Typhoon jets roaring overhead from nearby RAF Coningsby, *911 & Porsche World* operative, Paul Davies, was on hand for driving and scribbling duties. “It really is a lovely car,” he wrote. “The rebuilt and reshaped leather seats feel just right, and considering those eight-inch-wide front wheels, the steering is remarkably light. The engine is ultra-responsive, with the traditional boxer rattle transforming into that lovely rasp as revs climb and you charge towards the next Fenland bend. This car is all about power-to-weight ratio. The pedals are offset towards the centre, which is disconcerting at first, but soon becomes a forgotten problem. More important, the view over the flat nose is ideal for accurately placing the car on fast-approaching bends.”

Today, it’s my turn to take this beast for a spin. There’s yet more to the





Above You'll have to climb over the scaffolding to enter the car's cockpit

Below 993-sourced M64 flat-six is a 3.6-litre unit packing quite a punch in the car's lightweight chassis

story, though, not least the fact that, as intimated a couple of thousand words ago, this project is still evolving.

Once completed, the car was offered for sale via Maxted Page and was bought by a Ferrari collector who loved the Porsche, but never used it. After his death, his collection of cars went to well-known Maranello experts, DK Engineering, the 916 rep being sold to its current owner in 2015. Since then, he has invested a further £50,000 in ongoing development work. Blimey.

As it stands, clattering away on the asphalt, this heavily modified air-cooled classic comprises ninety-five percent of Gantspeed's specification. The one major difference, though — and the one responsible for making such a racket through the twin exhausts — is a 3.6-litre 993 engine in place of the 2.7 MFI unit. Sacrilege? Well, hardly, given the 'bitsa' nature of this car. Besides, the sale of the 2.7-litre boxer would have more than covered the 993 install, plus other tweaks. Running on PMO forty-eight-millimetre downdraught carbs, the engine is said to produce 280bhp.

Why bin the iconic RS donkey? Well, the current owner primarily bought this 916 recreation (evocation?) to take part in European tours and road rallies, at which it excels, but he was concerned about the 2.7's lack of torque and deep breathing, especially with high-altitude Alpine passes in mind. Hence, 993 power and 280lb-ft torque, a healthy lift over the 2.7's (tweaked by Gantspeed) 225bhp and 199lb-ft.

The 993 flat-six has been bolted to the 915 gearbox. Further tweaks over Gantspeed's configuration include Tuthill six-pot brake calipers and a WEVO side-shifter and gear lever, plus a dished MOMO steering wheel to replace the Gantspeed-fitted Mota Lita, complete with wooden rim, which seemed more trad-MGB than hot-rod Porsche.

There's no graceful way of getting my thirty-four-inch stick legs around the fully welded-in roll cage, complete with side impact bars. It's bum in first, then pull legs up and swing 'em over. The cage, though, is work of structural tubing art. Witness how it extends through the front bulkhead and picks up on the suspension turret mounts, triangulating across the inner wheel arches and luggage void.

Carbs, eh? They're rorting, snorting and spitting away over my shoulder. The exhaust is thumping, brapping and barping rhythmically. Honestly, this thing is an animal. The pleasingly chunky WEVO gate shifter clonks into first. I release the thigh-crushing clutch and I'm off, making a right din toward some of the really very good roads surrounding Export 56's Bedfordshire base.

Currently, this 916-alike is claimed to weigh just 943kg, meaning somewhere along the line, it's either been on a diet or someone's scales are out. Whatever,







the number is academic because acceleration is seismic. The whole noisy experience is deeply invigorating. It would have been interesting to try out the original 2.7-litre MFI engine, such is the character and elasticity of that particular flat-six, but there's no arguing with 3.6-litres, 280bhp and plenty of torque. It means you can make rapid progress in the higher gears, which is always preferable for a road car, rather than screaming away into the red.

Relaxing this thing is not, but it comes as no great surprise. Pretty well sorted? It is. Again, perhaps no great surprise, given the 914's wide and stanced footprint, plus flat-six in the middle, with its low centre of gravity. Add, also, chunky sixteen-inch Fuchs 8/9s wrapped in grippy Toyos and this is a chassis that belies its years. Porsche was right not to challenge the 911 from within — a contemporary example wouldn't have seen which way a 916 went, such is the difference between mid-engined and the pendulous rear-engined layouts.

PORSCHE WAS RIGHT NOT TO CHALLENGE THE 911 FROM WITHIN — A CONTEMPORARY EXAMPLE WOULDN'T HAVE SEEN WHICH WAY A 916 WENT

As picked up by Paul Davies back in 2008, the steering is surprisingly light and ultra-direct. The brakes? Six-pots to reign in under 1,000kg might be overkill, but you can never have too much stopping power, can you? They're perfectly modulated, too, with no grabbiness. All good, then? Well, largely, but the throttle linkage is a little sticky, making translation between accelerator and immediate progress less than smooth. One for the snagging list. And with 280bhp, the clutch doesn't need to be as heavy as it is. Standard is fine and, perhaps, the gear linkage could do with a little fettling, but this highly personalised Porsche is pretty much ninety-nine percent there and the only other 914 that I've driven that compares for thrills is the amazing carbon-bodied Fifteen Eleven restomod, boasting 987 Cayman power and rally-derived suspension. But that really is a very different container of aquatic life.

The leftfield appeal of this enduring 916 build is multi-faceted, but perhaps mulches down into three factors. One: it's been built to an incredibly high standard. Two: it's not another 911 restomod, or whatever you want to call them. Three: as Mick Pacey points out, just try and get close to this build in today's Porsche world. We dare you. ✪

Above and below
The car was found to be in need of a huge amount of metalwork, necessitating extensive restoration





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RUB OF THE GREEN

The KAMM Manufaktur 912 C now boasts production specification following its debut as a prototype, but can this carbon-clad coupe deliver on its promise of being a focused four-cylinder air-cooled Porsche, whilst possessing multiple personalities?

Words **Dan Furr** Photography **Dan Sherwood**

When attempting to determine which car to select as your first Porsche, there's every chance you've been lured by the romance of owning an air-cooled 911. And then you spot the price tag. If you're concerned about spend of this magnitude, consider the 912, little known outside Porsche circles. Billed as the entry-level Porsche at launch in April 1965, it was powered by the 1,582cc Type 616/36 flat-four, inherited from the overlapping 356 C, a Porsche discontinued in May 1966. Pragmatically, the 912's introduction was cost-driven: it came into being simply because the 911 was too expensive for many of Porsche's previous customers. Creating a more affordable Porsche — by putting a cheaper, less powerful engine into an austere version of the 911's bodyshell — was the logical solution.

Aesthetically, there was no difference between the 911 and 912, other than badging. The contrast came in the price. While the 1965 911 was priced at DM22,900 (£9,902), the 912 was stickered at DM16,250 (£7,026), therefore representing a saving of DM6,650 (a whopping £2,875). It was anticipated the new body shape (allied to a tried-and-trusted four-cylinder powerplant deemed perfectly acceptable by 356 buyers) would do the business. By comparison, the outgoing 356 C 1600 SC coupé cost DM16,450 (£7,113), meaning the 912 represented something of a bargain, certainly in terms of Porsche prices then as now.

You got the old running gear, but with a sleek new body shape. In short, the 912 was a safe bet, both mechanically and stylistically. Admittedly, the 90bhp flat-four's output was modest, especially when compared with the 911's 130bhp, but in reality, the smaller-engined Porsche was pretty gutsy, not least because at just 970kg, the 912 was a lightweight when pitched against its 1,080kg six-cylinder sibling. Despite the 911's flagship status, however, the four-cylinder model was a commercial success, particularly in the United States. Indeed, 912s were considerably more numerous than contemporary 911s, with 28,333 912 coupés and 2,562 912 Targas built against 22,768 of all types of 911 made between 1963 and 1969. Significantly, perhaps, the 100,000th Porsche to roll out of the Zuffenhausen plant was a 912 Targa (destined for Stuttgart's traffic cops).

A MEAN, LEAN, GREEN MACHINE DEMONSTRATING JUST WHAT'S POSSIBLE WITH THE 912 PLATFORM

By 1969, the deal with Volkswagen to produce the 914 as a joint venture called time on the 912, which literally had to make way for the mid-engined roadster on the Porsche production line. From then on, the 1.7-litre, VW-propelled, Targa-topped two-seater was presented as the new entry-level Porsche sports car. In any case, Zuffenhausen was confronting increasingly stringent US emissions legislation. This spelled trouble for the 912.

Porsche also had to rationalise its product line-up — the deal with Wolfsburg meant the 914 was a given, and the 911 range by now comprised three models graded according to performance and trim: the T, E and S.

Under these circumstances, the 912 seemed like an anachronism. We hadn't heard the last of it, though. In 1976, between the end of 914 production and delay of the incoming 924, the 'baby 911' resurfaced on the US market as the 912 E, complete with G-series impact bumpers, although as far as the cognoscenti were concerned, the comeback kid was pegged back by its Bosch L-Jetronic-injected 1,972cc flat-four, derived from the VW 411 and developing just 86bhp, less than the original 912. Only 2,099 9121 Es were manufactured, all left-hand drive. Famous owners include *Wheeler Dealer*, Mike Brewer.

On the road, it's far easier to explore the full performance potential of the 912 than that of a same-age 911. And, if the Type 616 flat-four is treated to upgraded barrels and pistons, it'll deliver similar power to the contemporary six-cylinder boxer. Crucially, and relevant to the theme of this bookazine, the 911 will deplete your bank account of considerably more cash than an impeccably restored example of the four-cylinder Porsche. Of course, those with their head in the sand won't be able to see past the badge at the rear of the 912. Sound familiar? If you're guilty of considering classic Porsche ownership as an air-cooled 911 or nothing, then I urge you to put prejudice aside and allow me to introduce you to the KAMM Manufaktur 912 C: a mean, lean, green machine demonstrating just what's possible with the 912 platform.

Three cars in one, so it turns out. The 912 C (the suffix denotes the presence of enough carbon-fibre to make NASA jealous) is the brainchild of Hungarian film producer, Miki Kazmer. Following a wave of press releases announcing development of the car back in 2022, I first got behind the wheel of the prototype on a sunny October day at Goodwood. "I wanted to develop a 912

Facing page Now in its early production specification, the KAMM 912 C is available with a full carbon monocoque



an owner would be comfortable in when commuting or driving short journeys around town, as well as when cruising on long-distance road trips," Kazmer told me when we met at the historic motorsport venue. "Simultaneously, the car needs to be ready to convincingly attack a track. It's a delicate balance."

The 911, you might think, would be the obvious starting point for his vision of a do-anything classic Porsche, especially when he cites the legendary 911 R as his primary inspiration, but with the cost of acquiring a mid-1960s Neunelfer now stratospheric, he reasoned the thirty-thousand-plus 912s built between 1965 and model discontinuation in 1969 provide a far more cost-effective and readily available Porsche for him to work with. And, as mentioned earlier, the 912 is hardly a compromise over classic 911 ownership — patience paid off for would-be buyers when the five-dial instrument cluster from the 911 became standard 912 equipment in 1967. Additionally, Fuchs five-spokes became a cost option, allowing the entry-level Stuttgart speed machine to look even more like a 911 than it already did. Heightened specification, however, attracted heightened cost — in the UK, the price of acquiring a new 912 rose to £1,974, saving buyers only £462 over shelling out for a 911.

Kazmer was keen to start his build with a higher-spec five-gauge 912, hence the purchase of the 1968 example his team transformed into the emerald-coloured marvel seen here. I remember considering the colour (not Irish Green, not British Racing Green, but somewhere in between) somewhat understated for a prototype intended to inspire series production. Even so, in the interests of remaining true to the original 912 aesthetic, the car's creator tells me he'd rather the deep hue covered the entire body — beautifully woven carbon is exposed in flashes from nose to tail, whether it's the 'torpedo tops' of the front wings, the carefully isolated Mobil Pegasus motif on each flank, the door number circles or the stripe running down the centre of the engine lid, bonnet and bumpers. From a marketing perspective, it's critical for KAMM to promote just how much high-quality carbon-fibre has been used in the construction of this car. In this regard, the exposed weave does a brilliant job, but it doesn't sit well with its master's desire for 912 Cs to operate under the radar. Incidentally, KAMM customers feeling flush can option a full carbon-fibre monocoque.

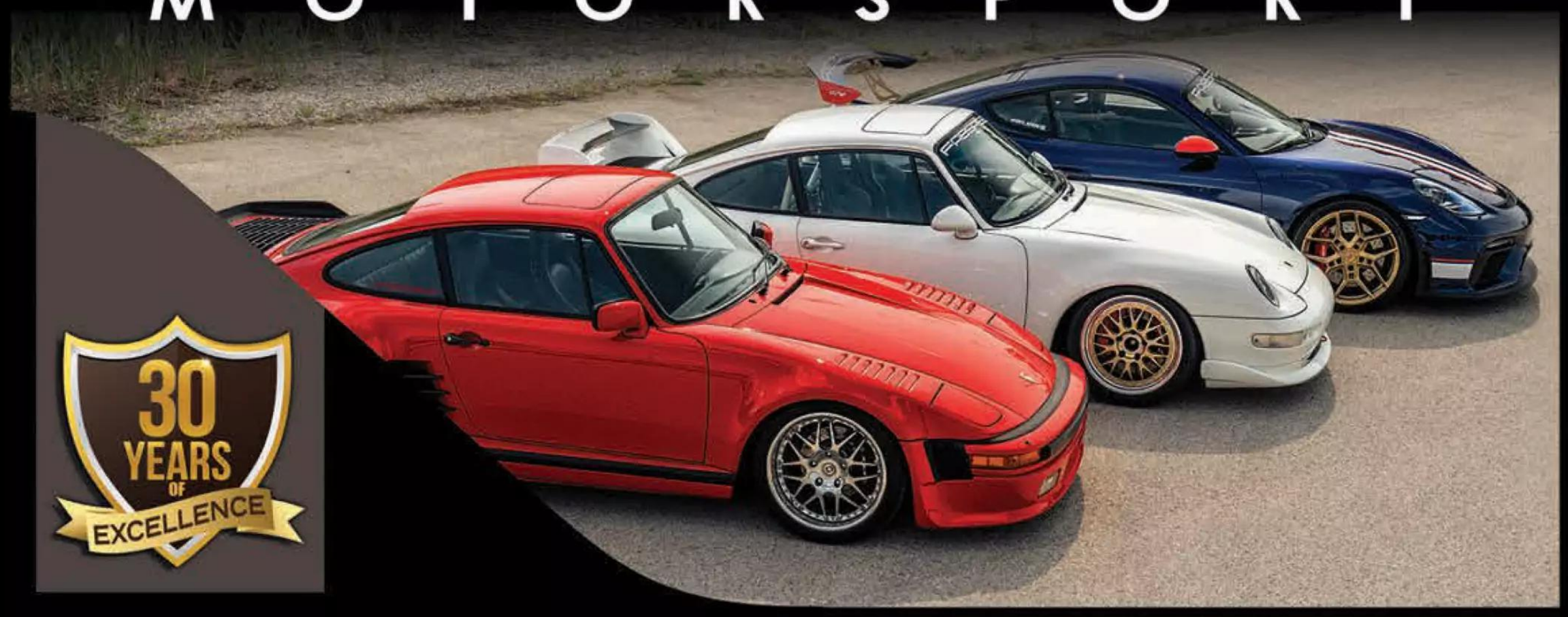
THE TWO-LITRE FLAT-FOUR IS NOW PRODUCING 190BHP AND ALMOST 185LB-FT TORQUE, ALTHOUGH IT FEELS CONSIDERABLY MORE POTENT

Lift the engine lid and you're presented with even more carbon-fibre. It's everywhere, from KAMM-branded throttle body trumpets to the shroud surrounding the beefed-up flat-four.

"I don't like the 'doghouse' look of the standard Type 616 boxer, which I consider too similar in appearance to same-age Beetle engines," Kazmer explains. "With this in mind, my engine builder, JPS Aircooled, sourced a Type 547 four-cam engine cooling shroud, which was subsequently used as the template for a carbon-fibre version made specifically for the KAMM 912 C." Open the lid and the result is something of a 'jewellery box' effect, but don't be fooled into thinking the changes are only skin deep, though.

Above Much more than the 'baby 911', the 912 is deserving of standalone praise as one of Porsche's best legacy products

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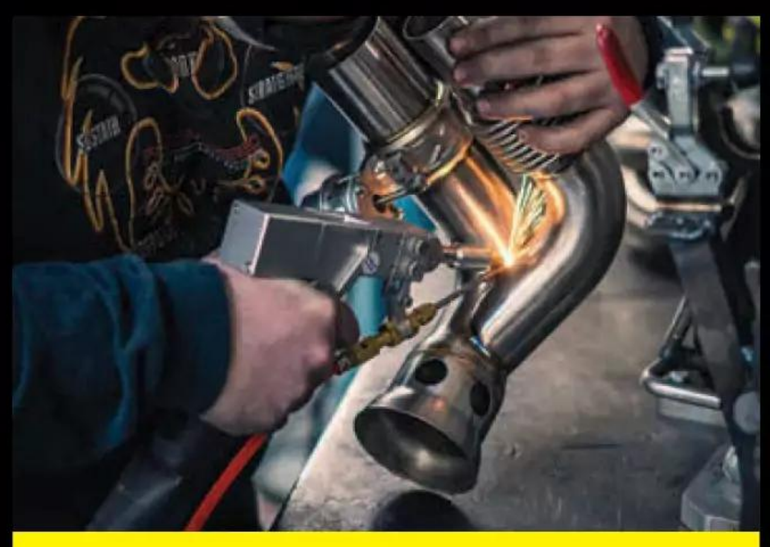
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An aerospace engineer by trade, Josef 'Pit' Schweiger established JPS Aircooled in the Swiss municipality of Geuensee as a producer of high-quality precision parts for 356 and 912 engines. From valvetrains to pistons and cylinders, manifolds, flywheels and carburettor components, Pit has been providing individual parts and oversized four-cylinder air-cooled engine kits (displacement ranging from 1,720cc through to 2,054cc) to owners of early Porsches for many years and has an international client base spanning all four corners of the globe. JPS Aircooled was therefore the obvious choice when Kazmer wanted to partner with an engine builder capable of thoroughly transforming his 912's 1.6-litre lump.

GIVE IT LARGE

The prototype engine was enlarged to two litres and developed power approaching 170bhp, which might not sound much by today's Porsche powertrain standards, but it's important to be aware this is almost double the 912's original output. Plus, when you consider the KAMM car weighs an astonishingly low 750kg, the power to weight ratio is in keeping with many of today's smaller sports cars, ticking the box on Kazmer's wish list dictating the 912 C needs to be capable of keeping up with modern traffic. He wasn't done there, though. Working with Schweiger following the prototype's star turn at Goodwood, the engine was comprehensively redeveloped with an uprated case, billet heads, rods, reprofiled cams, drive-by-wire throttle bodies, a Life Racing ECU, plus an advanced power distribution module replacing fuses and relays with solid-state switching. The result is noticeably smoother operation, instantaneous throttle response and a significant hike in horsepower — the two-litre flat-four is now producing 190bhp and almost 185lb-ft torque, although it feels considerably more potent, partly a result of the low body weight and a 7,200rpm redline (raised from the prototype's 6,800rpm), which I'm keen to exploit.

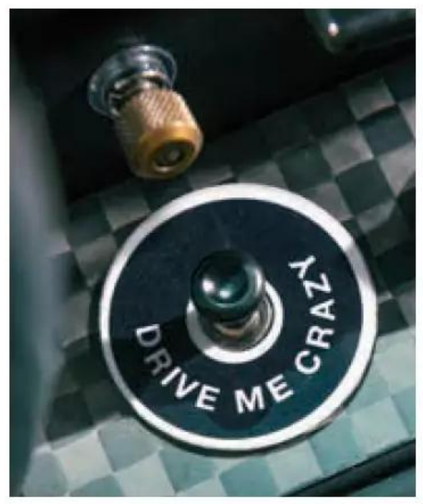
Transferring power to the rear wheels is a five-speed dog-leg Type 901 gearbox, which replaces the car's original four-speed unit. Kazmer toyed with the idea of a Hewland sequential transmission, but opted for the OEM-plus option in a bid to stay true to the 912's heritage. Different ratios have been fitted (a choice of short or long ratios are available), making for a suitably track-focused cog swapper. A ZF limited-slip differential has also been



Above and below
Editor Furr gets to grips with the 912 C on Bedfordshire's high-speed twisties











Above If you missed the carbon flashes exposed by pauses in exterior paintwork, there's no escaping the lashings of lightweight weave in the 912 C's cabin

Right Tilton pedal box is the perfect choice for the KAMM car

Top right Never look a Roland Gift horse in the mouth

added, while a hydraulic racing clutch provides greater shift control and ease of use in traffic.

Where the prototype 912 C rolled on replicas of the Ford GT40 six-spoke, Kazmer has worked with British wheel manufacturer, Image Wheels, to develop a bespoke fifteen-inch single-piece wheel (choose between five-stud or centre-lock) mirroring the look of rims propelling the legendary 917 sports-prototype to victory at the 24 Hours of Le Mans. This is a far more aesthetically appealing design and is better suited to the 912 C, not only in terms of the car's overall looks, but by providing a nod to Porsche's competition history. The wheels are wrapped in sticky 195/55 (front) and 205/50 (rear) Yokohama Advan Neova AD08 RS semi-slick tyres.

Replacing the prototype's 964-derived Brembos is a set of AP Racing four-piston brakes clamping drilled and grooved discs. In fairness, for a car this light and sub 200bhp, this configuration is overkill (more so the carbon-ceramic brakes recently requested by a KAMM customer), but the distinctively branded anchors look great and sit snug behind the chunky spokes — the width of a Rizla paper separates rim and caliper.

Admittedly, there is an element of 'futureproofing' taking place against further power increases. Oh, and there's a hydraulic handbrake at play, allowing drivers to do their very best impression of drift king, Keiichi Tsuchiya.

When I drove the prototype and was asked by Kazmer to provide an honest assessment of the car, my biggest criticism concerned its suspension. The setup made use of adjustable dampers (with front coilovers manufactured to bespoke specification), plus adjustable rear arms, RSR-style anti-roll bars and polybushes throughout, but I reasoned ditching the torsion bars and switching to full coilover suspension would not only allow the engine to be brought further forward (thereby improving front-to-back weight distribution), but would also enable the appointment of TracTive semi-active suspension, a system some of you will be familiar with through our testing of various feature cars making use of the Dutch brand's products. There was only one snag: at the time of my loan of the 912 C, TracTive didn't make a suspension kit for the 912.

THE CAR'S STEERING FEELS VASTLY IMPROVED, THE RESULT OF AN UPRATED QUICK-RACK

As mentioned elsewhere in this bookazine, TracTive's Active Controlled Electronics (ACE) dampers are fitted with patented Dynamic Damping Adjustment (DDA), a dynamic proportional valve operating as a bypass, allowing capacity for a large range of damping. Capable of operating from soft to hard in a barely believable six milliseconds, a TracTive ACE system is one of the world's fastest suspension solutions.

ACE has an intuitive ability to react to changing track surfaces and road conditions. Bumps, compressions and rumble strips mid-corner will be absorbed before the driver has time to react, easily holding the desired line through a series of high-speed bends. Grip levels in all conditions are vastly increased, giving the ability to push the host Porsche to limits the driver previously thought not possible. Configuration can be achieved by way of an in-cabin rotary switch or a full-colour touchscreen controller, allowing damping presets to be stored and activated in an instant, even when on the move.

At the very least, compare the convenience of a system like this to having to stop the car and crawl around on the floor to fiddle with on-body damper adjusters. Being able to switch between suspension settings on the fly is a huge win for the driver of any car travelling on contrasting surfaces. I'm not talking exclusively about variations between road and track — the standard of UK roads differs wildly from street to street, much as it does in Kazmer's native Hungary. Being able to soften or stiffen damper rates while the car is moving across changing surfaces (or

from one end of a long track to the other) is a luxury no Porsche owner will want to be without after experiencing what a TracTive system has to offer.

Following Kazmer's work with TracTive to develop a prototype 912 ACE system based on the suspension brand's offering for the G-series 911, I was delighted to learn TracTive now offers a 912 series production kit, as fitted to the KAMM car. A discreet dash-mounted rotary knob flicks between settings. Talking of cabin furniture, carbon rules the roost. It's everywhere you look, from the bespoke leather-trimmed buckets, to the gear stick, gear knob, steering column cowl, dash centre strip, rear quarters, parcel shelf, door cards, and floor boards.

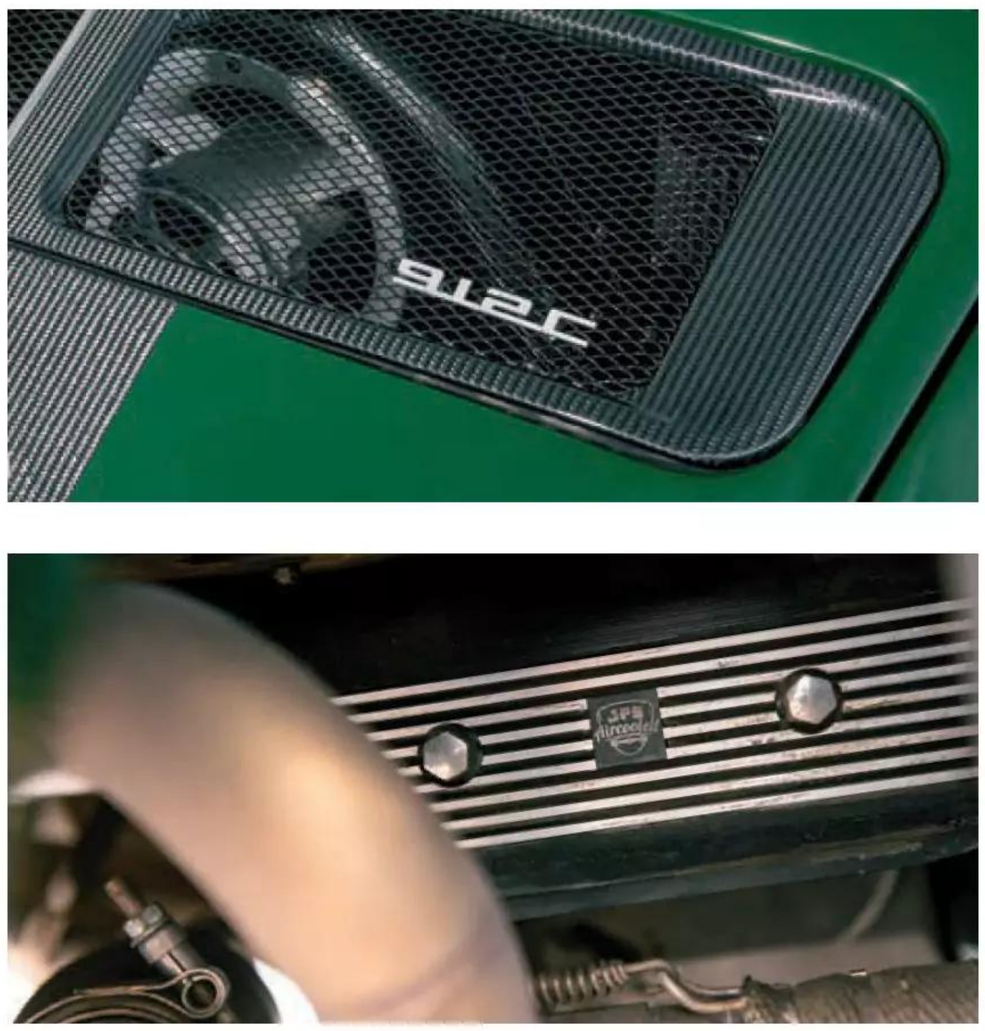
GRAND ENTRANCE

As I noted when testing the prototype, climbing into the 912 C is a breeze. There's no roll cage Meccano to contort my body around, no awkward bucket seat bolster to jump over. Each pew is kitted out with a multi-point safety harness, which is unnecessary for the road, but the track-friendly bias of the 912 C lends itself to this kind of heavy-duty safety equipment. In truth, it makes a change for me to hop into a 912 with any kind of seat belts — Porsche offered them as an optional extra in period.

When I was in charge of the prototype, my driving was limited to the roads in and around the Goodwood estate. Relatively high-speed roads, I grant you, and there were a few tasty corners to chuck the car into, but knowing Kazmer is pitching the 912 C as an air-cooled Porsche perfectly at home racing around a track as it is commuting, I felt it important to test the production version in a variety of driving environments, tackling inner city traffic, motorways, twisty B-roads and an open circuit. Across a couple of days in early July, this is exactly what I did.

I started my drive in central London, more or less in rush hour. Making my way out of the city, I was immediately hit with heavy traffic demanding lots of stop-start action, lane hopping and sharp turns down concealed side streets as sat-nav constantly altered the route I was travelling. It was a particularly hot day, but the 912 C's electric air-conditioning system kept the cabin cool and the needles on gauges monitoring engine operation remained stable during long periods of idle. The car's steering felt vastly improved, the result of an uprated quick-rack, and I was immediately

Above Wheels are a bespoke take on the 917's six-spokes















Above Lightweight construction affords the 912 C kerb weight of just 750kg, with further savings to be made, as a recent customer commission is proving through the use of carbon-ceramic brakes and titanium for various chassis componentry

impressed by how comfortable the ride is. By contrast, on the roads around Goodwood, the KAMM prototype felt somewhat crashy, as though the car was riding on its bump stops, even with a moderate damper setting dialled in. Here in London, dropping in and out of potholes, navigating roadworks and doing my best to avoid contact with kamikaze motorcycle couriers, the ride was as comfortable as you'd expect from a family hatchback.

The transmission has also been hugely improved over what came before. "The biggest problem with the stock 901 gearbox is its linkage," Kazmer suggests. "Worn plastic parts cause a huge amount of movement. My team designed a new uniball-free linkage incorporating chromoly tubing and all new metal bearings, thereby reducing movement. The last thing I want is for someone to question which gear they're about to select when they're driving the 912 C. It's important this car retains the analogue driving experience one expects from a classic Porsche, but removes the stress associated with operating a retro ride. Essentially, the new linkage incorporates a link for moving the gear stick front and back, plus another for left and right. The outcome is greater feel and, with a gate in for reverse, there's no chance of accidentally selecting anything other than forward gears."

A spring centres the stick when in neutral. Eventually, I made my way out of London and reached the absurdly dull M1. Cruising at speed was hampered by sudden colossal rainfall, but considering the 912 C weighs less than half a Ford Focus and rides on semi-slicks, this raucous restomod maintained impressive grip, even when all four lanes were completely hidden from view on account of deep water drowning them.

IF YOU'RE IN A POSITION TO DO SO, CONTACT KAMM MANUFAKTUR AND SECURE ONE OF THE FIRM'S PRECIOUS FEW BUILD SLOTS

Bedfordshire's rural twisties, blessed with dry asphalt and blazing sunshine, beckoned. It was here I got to find out just what the updated 912 C is capable of. First point of order? Switching the TracTive suspension to a harder setting and pulling the new-for-series-production dash plunger labelled *Drive Me Crazy*. Now, you'd be forgiven for thinking I was instantly subjected to hits from three-piece 1980s pop sensation, Fine Young Cannibals, but no. Instead, I'd activated an ECU map releasing all the power on offer. Working through the gears, foot to the floor (interspersed with dabs of heel and toe), the flat-four created one of the most satisfying engine noises I've heard in a Porsche. It was as if a tommy gun was going off behind my ears. It was loud, of course, the volume made greater by the installation of thin polycarbonate windows, but it wasn't loud enough to make me want to ease off the gas. On I pressed.

Along straights, this thing pulls and pulls. And pulls. Here, the scant weight of the car made itself known, and though Kazmer tells me KAMM is developing a 912 C aero kit to counter the threat of front-end lift as further power is released from the four-cylinder boxer at the rear, I didn't detect the nose twitching as I rushed toward the redline at every opportunity. Then again, I wasn't on roads long enough for me to reach the kind of speed where I'd need "really big balls", as he succinctly puts it. Even so, as alluded to earlier, it's possible to wring the neck of this car and explore much more of its performance potential than you'd be able to in a same-age two-litre 911 — you can drive the KAMM 912 C at ten tenths, whereas you're probably only likely to explore half (or less) of what a same-displacement air-cooled 911 offers before you run out of road or, more likely, run out of talent behind the wheel.

Even in a 912 bearing standard trim, you don't need to be travelling particularly fast to feel like you're reaching high speed. All the thrill of a 911 without the risk of losing your driving license. What's not to love? More downforce is always welcome, though, not that the TracTive system had trouble

not that the TracTive system had trouble pinning the car to the road, even when I launched into corners quickly. This confidence is inspired by my experience of ACE technology in various Porsches, from an electric 964 to a 997 Cabriolet and everything in between. Put simply, no other available aftermarket suspension comes close to how well-suited TracTive products are to Porsche sports cars.

The AP stoppers have instant bite and slow the car just as effectively as I could hammer it along the high-speed stretches of Bedfordshire backroad. There's much more power in the lower rev range than I remember from the 912 C prototype, which is a hugely pleasing development. On this note, I should point out nothing KAMM does is a process of trial and error. Kazmer's team is engaged in advanced engineering and simulation at every stage of vehicle development.

To the track. I ventured onto a small circuit requiring constant jumps between throttle and shift. When I tested the prototype 912 C, Kazmer stressed the car was more circuit-biased than he intended the company's production run of 912 Cs to be, hinting further development work would result in less of a workout behind the wheel. He's obviously delivered on this promise. Don't get me wrong, the series 912 C is a physical drive, but you're not going to step out of this car feeling tired, even after multiple laps around a challenging circuit.

There's more on the horizon, too. Customer orders are in, and with them come requests for individual equipment. There's the aforementioned carbon-ceramic brakes, but the next phase of 912 C development will also see the introduction of new CAN-driven dash clocks, further transmission upgrades (a push-button gate for reverse, among other changes) and development of magnesium and carbon-barrelled wheels. Titanium is being used for manufacturing of driveshafts and trailing arms. Creating a lightweight air-cooled Porsche is clearly a case of *how low can you go*?

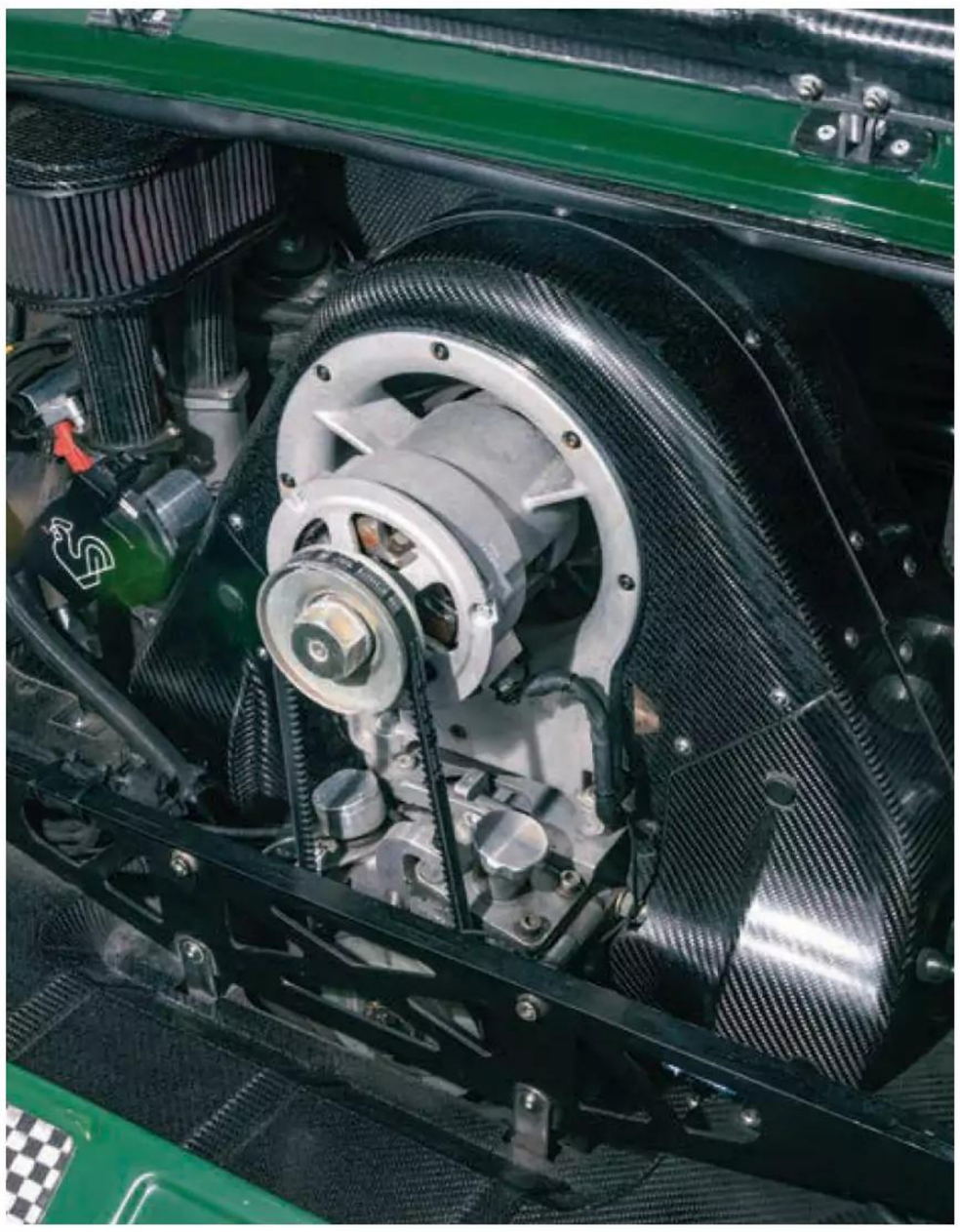
There's a 912 C Targa in the works, too. As a result of enhanced specification, the 912 C is now priced at €360,000, which includes acquisition of a donor 912. KAMM customers can supply their own 912 for conversion, which drops the price to €320,000. With many Porsche restomods starting at seven figures without donor car, this represents fantastic value for money.

I'm not going to pretend six figures is typical of the amount of dough someone has to set aside when shopping for a 912, but the KAMM 912 C serves not only to demonstrate how there are serious alternatives to the 911 when it comes to parting with your hard-earned cash, but also just how capable cars outside the 911 stable are when given the lease of life not afforded to them by the factory. Budget forty grand for a 912 E, fifty for a short-wheelbase version of the original 912. Do the smart thing and also budget for the cost of TracTive suspension.

With the 912 C prototype, I suggested Kazmer was on the verge of creating one 912 to rule them all. With production specification, he's nailed it. If you're in a position to do so, contact KAMM Manufaktur and secure one of the firm's precious few build slots. Don't be left green with envy. ✪

Above TracTive and KAMM worked on developing a semi-active suspension system for the 912 C

Below JPS Aircooled flat-four apes the look of the iconic Type 547 four-cam and pumps out a healthy 190bhp



DARE TO DRIVE

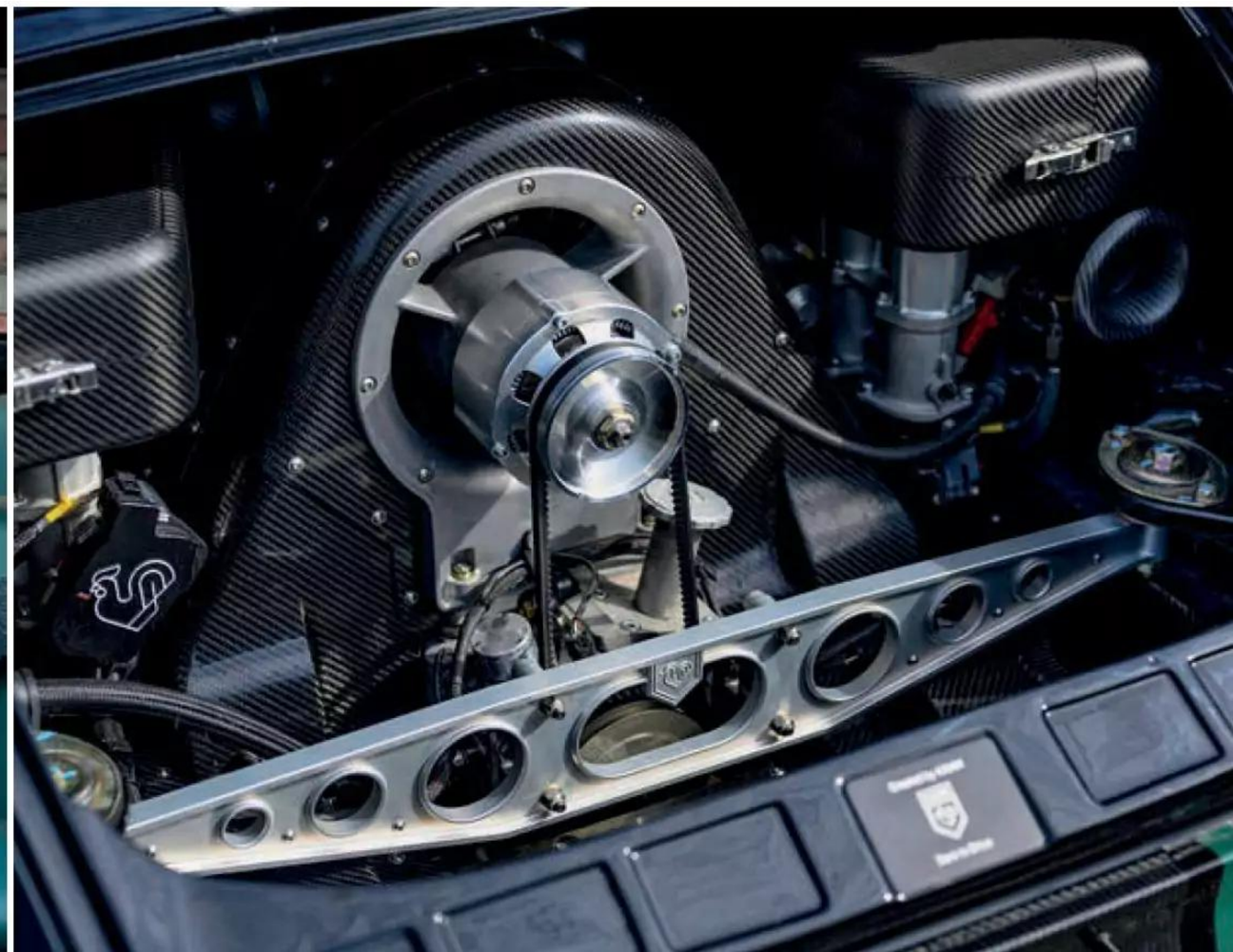
KAMM 912C

kammanufaktur.com info@kammanufaktur.com @ kammanufaktur_

“Simplify, then add lightness”

— Colin Chapman







SINGER WHEN YOU'RE WINNING

We recently had the honour of visiting Singer Vehicle Design's incredible 115,000ft² headquarters in Torrance, California, where more than four hundred skilled technicians work to reimagine 911s based on the 964 platform, fresh from its thirty-fifth anniversary. We collared company founder, Rob Dickinson, for a chat...

Words **Stephan Szantai** Photography **Singer Vehicle Design**

Entering Singer Vehicle Design's generously sized headquarters in the Los Angeles metropolitan area is a challenge, chiefly on account of the number of visitors allowed to visit the site being strictly limited. Good things come to those who wait, though — not only were we treated to a guided tour, but we also had time to fire questions at company founder, Rob Dickinson, who was more than happy to take a step back in time and chart the rise and rise of the business.

The Torrance-based facility was inaugurated in 2022 is simply extraordinary, not only in its size, but in its clinical cleanliness and the meticulous organisation of both workforce and project management. All aspects of restoration are gathered under one roof, the building playing host to no fewer than seven paint booths (three double booths and a single unit). Only the dismantling of donor 911s is undertaken away from this pristine working environment. Of course, you'll be wondering how many donor 964s are on site at any one time. At a glance, we estimate around seventy-five cars are awaiting the Singer treatment. It's worth remembering, during the 964's production run (taking place between 1988 and 1994), just 63,762 units rolled off the Porsche production line, making this particular Neunelfer subject to the lowest-volume production of all 911 generations to date.

Our visit, as well as our chat with Rob, allowed us to better understand Singer Vehicle Design's studies (Rob's team never refers to its restorations as 'models'), which allow clients to define the direction of their 964 restorations. Anything is possible, evidenced by an endless choice of colours and the most surprising interiors. Indeed, one of the company's customers recently chose upholstery incorporating twelve different colours. Naturally, these cars are not inexpensive, with your bill beginning at $850,000 for Singer restoration services and beyond $2 million for Dynamics & Lightweighting Study Turbo (more on this later), excluding the cost of the base car. Perhaps you're already in possession of a 964 ready and waiting to be reimagined? You know who to call.

ONLY THE DISMANTLING OF DONOR 911s IS UNDERTAKEN AWAY FROM THIS PRISTINE WORKING ENVIRONMENT

Good afternoon, Rob. Please can you tell us a little about your background, including your passion for restoring classic Porsches?

I grew up in the UK. I was a car-obsessed kid and used to get my father to take me to motor shows, where I'd grab as many manufacturer brochures as I could lay my hands on, bringing them home and poring over the beautifully photographed cars on the pages within. If I thought I was missing a particular publication, I'd write letters to the car companies asking for it to be sent out to me. My love of all things automotive led to my studies in the field of industrial design and transportation at Coventry University, after which, I went to work as a member of the design team at Lotus in Hethel, Norfolk.

You were also the singer in a successful alternative rock band, and your cousin is none other than Iron Maiden frontman, Bruce Dickinson?

True on both counts. I'm passionate about music. For a decade, I was singer-songwriter for the band Catherine Wheel. We toured the world and released five studio albums. The last of these was released at the turn of the century. Five years later, I released a solo album, *Fresh Wine for the Horses*.

This is where the Singer name comes from, then?

Partly. There's obvious influence from my musical background, but also a little hero worship for legendary Porsche motorsport engineer, Norbert Singer, the mastermind behind so many of the manufacturer's race wins. Also, 'singer' is a way of describing an air-cooled flat-six, referencing the noise it makes. When Catherine Wheel disbanded, I relocated to the USA, first to New York, then to California, where I bought my 1969 911 E, which I extensively modified in the interests of developing my own 'café racer'. Fans of the marque would regularly stop me to ask about the car, which ultimately served as the genesis for Singer Vehicle Design.

Ah, yes. Tell us about the beginnings of the business.

People kept asking if they could buy

Facing page Singer Vehicle Design founder, Rob Dickinson, pictured at the Goodwood Festival of Speed

my 911, which I had painted Bahama Yellow. I always said no, but the idea to offer services allowing owners of classic 911s to pursue their own beautifully reimagined cars started to form. Singer Vehicle Design was subsequently established in a corner of a small workshop in Sun Valley, near Los Angeles. This was 2008. I drove a G-series 911 into the workshop and proceeded to strip the bodywork away. Then began many months of blood, sweat and tears. Eventually, the first Porsche 911 reimagined by Singer Vehicle Design emerged, just in time to for it to make an appearance during Monterey Car Week in 2009.

This was obviously a major milestone in the company's history, but what others stand out for you personally?

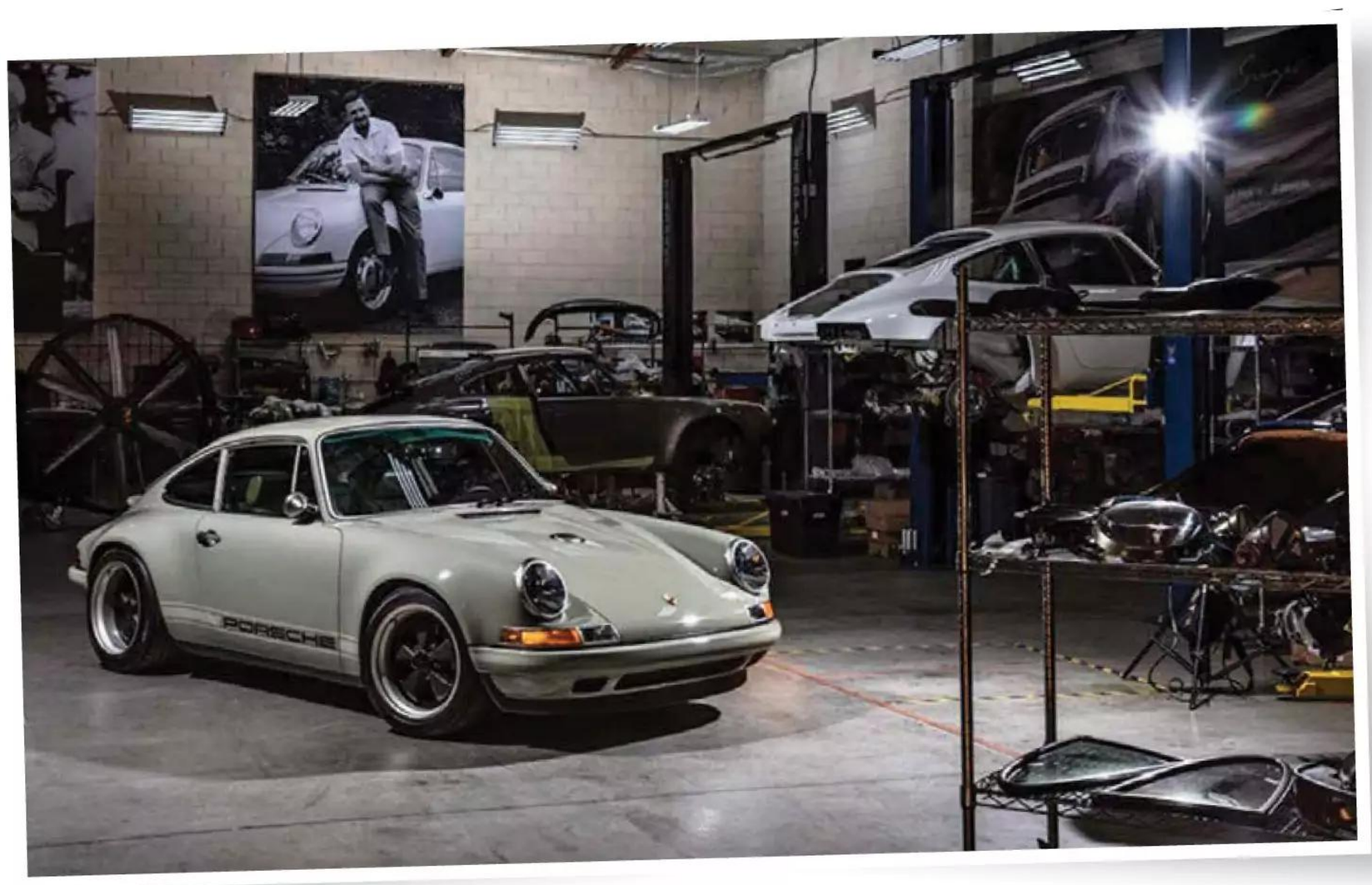
Switching to the 964 platform was a major development. I reasoned the 964 offered more scope to optimise dynamic performance. After a brace of restored G-series 911s, every Porsche 911 reimagined by Singer Vehicle Design has been based on a 964. Around 2014, we were able to develop a four-litre evolution of the M64 flat-six, which really helped in allowing owners to unlock more power for their cars. It's difficult to argue the case against the Classic Study, which offered a choice of 3.8-litre or four-litre flat-six, being responsible for putting Singer Vehicle Design on the map. Then, in 2018, we presented the results of the Dynamics & Lightweighting Study for the first time. We'd undertaken the study with a formation of technical partners, including Williams Advanced Engineering, Michelin, Bosch and others. It was a huge step for us — we had to set up new operations in the UK to make the project work, but it really helped us keep pushing. Since then, we've been flat-out, it just hasn't stopped. Consequently, in 2022, we brought what had become seven separate sites in California together under one roof. This was an essential step, followed by presentation of the Turbo Study, essentially a celebration of the 930. Last year, we presented the Dynamics & Lightweighting Study Turbo, inspired by the classic Porsche 934/5 endurance racing machine.

How is the company organised?

Our main centre of operations is here, in Torrance, near Los Angeles. This location is home to all Classic Study and Turbo Study restorations. My design studio is at a separate location a few

Above Singer CEO, Mazen Fawaz, takes to the driving seat

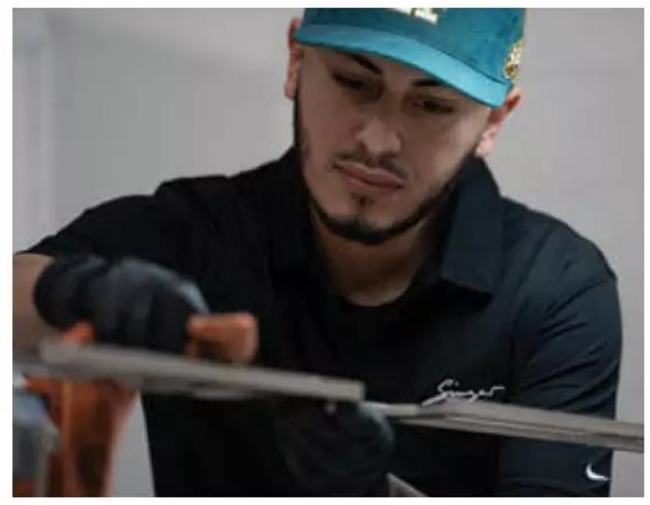
Below The original Singer Vehicle Design workshop, where the company initially focused its attention on the G-series 911 before switching to the 964 platform



SINGER VEHICLE DESIGN











Above Singer's US workforce numbers some four hundred staff, with a further two hundred employees based at the company's growing UK outpost

miles away. In the UK, we have another automotive facility, not far from Oxford. All restorations enabled by the Dynamics & Lightweighting Study were completed at this location and the first Dynamics & Lightweighting Study Turbo restorations are underway at this site as we speak.

What is the size of Singer Vehicle Design's workforce?

The company has more than six hundred staff. Four hundred are here in the US, two hundred are based in the UK.

To what do you credit the firm's huge success?

We celebrate the essential genius of the 911, as well as the people at Porsche responsible for creating such an iconic sports car. Singer Vehicle Design is staffed by Porsche-obsessed people. We immerse ourselves in the marque, each and every day. A long time ago, I painted three words on a wall in our first workshop: everything is important. It was a reminder to pay attention to every detail. Those three words continue to be at the core of what Singer does. There is, of course, deep love for the 911 all around the world. Our work to reimagine these incredible cars, many of which have led very hard lives for many decades, shows as much.

Where does inspiration for each restoration come from?

Our amazing clients bring their own sources of inspiration. Most of these owners are Porsche obsessives, just like us. They're inspired by cars they saw as kids, raced on track, watched in films. One of the things that makes the 911 unique is how it was carefully, conservatively optimised across many years for both road and motorsport, whilst always remaining true to the original 911 concept. Owners can draw inspiration from all these chapters of the 911's evolution. They draw inspiration from beyond the automotive world, too. Fashion, architecture and art have all influenced how people approach vehicle restoration. We respond with the focus and quality that we've become famous for — injecting cutting-edge engineering into iconic design and insisting on execution at jewel-like standards. We attempt to weave all this together coherently, celebrating the brilliance of the 911.

Have you ever had to refuse a client's request for being too wacky, too controversial?

The boundary most important in all of this is refusal to compromise. There aren't any shortcuts in the pursuit of perfection. We sometimes talk of *a relentless pursuit of excellence* when describing our mission. It's not just a marketing phrase. The word 'relentless' is important. The process can be exhausting and excruciating, but it's the only way.

For the benefit of readers new to Singer Vehicle Design, please can you describe each of the company's studies?

It's important to note we don't have 'models'. Each study is undertaken to enable owners to request personalised restoration services for their 964. Broadly speaking, the Classic Study serves to celebrate the F-series long-hood 911, while the Dynamics & Lightweighting Study enables further optimisation for high performance, with influence taken from iconic 911s, including the Carrera RS 2.7. The Turbo Study celebrates the 930, while the Dynamics & Lightweighting Study Turbo brings together the four-valve engine from the Dynamics & Lightweighting Study and forced induction, whilst celebrating the classic Porsche 934/5 endurance racer. Weight varies depending on the specification chosen by each owner, but Dynamics & Lightweighting Study restorations will be the lightest. The Turbo Study is a little heavier, but this shouldn't come as a surprise, considering the car's luxury grand touring abilities.

How many cars has Singer Vehicle Design completed to date?

Let's be clear — Singer Vehicle Design does not manufacture cars. We restore 964s at the request of their owners. The car begins as a 911 and remains the same 911. It is not a new vehicle. To date, we have restored more than 380 cars. More than three hundred of these are the result of the Classic Study and seventy-five are Dynamics & Lightweighting Study restorations. The first restorations enabled by the Turbo Study and Dynamics & Lightweighting Study Turbo are now moving through our facilities in both the US and UK.



What modifications are you making to the host 911's engine, gearbox and running gear?

Put simply, we respond to the requirements of owners. The process begins when the owner of a 964 sends their car to us with a request to carry out a personalised restoration. The chassis is painstakingly assessed, cleaned, strengthened and prepared to ensure it is in optimal condition for the project. Modified carbon-fibre bodywork allows for a significant reduction in kerb weight. The M64 engine is disassembled down to the engine block, before being restored using high-performance components and modifications to optimise performance. Owners chose the character they prefer for their car. For example, suspension and damping rates can be adjusted to suit the owner's driving style. They can tailor the interior as they choose, of course.

How do you determine which materials and fabrics to deploy?

Materials are often selected on account of them possessing properties optimising the performance of the car in question. For example, carbon-fibre allows for weight reduction, as does magnesium, which is used to manufacture wheels developed for the Dynamics & Lightweighting Study. Inconel and titanium are used in exhaust systems for their ability to withstand very high temperatures. In other areas, clients are driven by their personal tastes. Some drivers want to create luxurious specification for their car and may select leather. Others may wish to use other types of fabric or textile, such as the sport-mesh fabric seen in the Dynamics & Lightweighting Study Turbo.

Which aspects of a restoration are supplied by subcontractors?

We partner with the best automotive brands in the world. Examples include Michelin, for its expertise in tyre technology, and Bosch, for its ability with ABS, traction control and electronic stability control systems.

How do you test different studies during their development?

Each study involves our development teams covering tens of thousands of miles in a 'mule' and various test cars. They travel to the most famous automotive proving grounds in the world, including Nardo in Italy, the Nürburgring in Germany, IDIADA in Spain, Millbrook in the UK. This is in addition to thousands of miles of road testing. Once a restoration is finished, a car will then complete further shakedown drives before being presented to its owner.

Do you fear 911s reimagined by Singer Vehicle Design are a trend that could disappear?

Beauty, craftsmanship and innovation are defining characteristics of everything we do. These are enduring qualities, not passing fashion. This is why we focus so carefully on getting them right.

What's next for Singer Vehicle Design? Any new projects to speak of?

We no longer have restoration slots available for the Classic Study, but we have around 150 cars to restore for their owners. The first Turbo Study restorations will be finished in the US very soon, with the first Dynamics & Lightweighting Study Turbo restorations not far behind in the UK. We have plenty of further work to engage in with these studies over the next few years, but beyond this, I can't say anything more at this time. Watch this space, as they say.

Do you have an objective concerning the number of 964s you'd like to restore each year?

Our goal is simply to respond to demand from owners. Anything bearing the Singer Vehicle Design name will always be a rare object. We're obsessed with ensuring we never compromise on quality. The growth in the size of our team enables us to carefully respond to demand, while maintaining firm focus on execution and craftsmanship.

Thanks for your time, Rob.

With the greatest pleasure. ✪

Above The Dynamics & Lightweighting Study Turbo (DLS Turbo) at Singer's base in the UK

65-67 USA Headlight Assemblies

NEW reproduction of the original Hella headlights for the early USA cars.
Part # 901.631.102.01

These have been unavailable for many years. Use with standard 7" USA sealed beam bulbs, or drop in a pair of 7" Hella H4's, Cibie Bi-iodes, or your favorite LED lighting.
We used brass for the trim ring, which is then chrome plated just like OEM.
We didn't just use stamped steel which rusts....and doesn't fit well.



Correct screws with oval head, not just flat head machine screws... and they are chrome plated.
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Raised script on the glass (sorry no Hella logo), correct SB 19-20-21 script and we used a special glass type called "Borosilicate"... it's stronger than standard glass and will resist rock chips and breakage better than the standard glass!
Complete with the bulb springs, and the correct attachment screw.
Perfect fit right out of the box, just install your own 7" bulbs, plug, and play!



1965 to 1967 parking brake boot.
No slits and no side tabs,
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details are correct



Rear bumper endcaps for the 65-68 cars is back in stock! Correct satin brushed finish, and the hardware is included as well



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Exact new re-production of the original SWF wipers for 1965 to 1967, painted in correct silver finish. Wiper blades and arms available as a package or separately. Silver arms and blades



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PORSCHE
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NO SUBSTITUTE

Don't mess about! If a particular competition model has caught your eye, or if a specific era of Porsche production turns you on, then go for it. This is precisely what Dave Lewis did — infatuated by the legendary 911 S/T, he found just what he wanted in a backdated 1981 SC...

Words **Johnny Tipler** Photography **Dan Sherwood**

As 911s go, it looks pretty young, but this SC retrospective sets out to *evoke* the 911 S/T. What exactly *is* an S/T? Let me take you back to 1967, when Porsche was not the given race winner we take for granted today. Sure, during the 1950s and 1960s, the brand was regular class victor in top-line international motorsport, even winning the Targa Florio outright, but it had yet to top the podium at Le Mans, which it did for the first time in 1970. The 911 was slowly gaining ground in the lower orders, but was yet to realise its full potential at international level.

The first factory racing 911 was simply designated R (for *Renn*) and was unveiled in 1967. It was an austere, pared-to-the-bone, hot two-litre coupé with fibreglass panels and perspex windows. Its successor was the T/R of 1968, quickly followed by the S/T in 1970. Under the direction of Porsche motorsport director, Fritz Huschke von Hanstein, the intention was to run the R in sportscar racing, but homologation rules pitched it in with prototypes. Consequently, in 1968, Porsche created the 911 T/R, a 911 T chassis making use of a 911 S engine and homologated as a Group 3 GT car — still relatively modified, but less so than the R. Somewhere in the region of thirty-six T/Rs were built and campaigned by professional and amateur race and rally teams.

For 1970 and 1971, following the FIA's decision to allow big changes to production cars for GT racing, Porsche reasoned a lightweight version of its 2.2-litre S would be the perfect 911 for touring car racing and rallying. Thus, the S/T was born, and though the rally cars retained standard engines, racing versions were initially increased by 52cc, accompanied by a power hike from 180bhp to 240bhp, fired by twin-plug ignition and mated to a 901 transmission and limited-slip differential. Only a handful of 2.3-litre STs were built in race and rally form, with a further twenty-three units of the later 2.5-litre S/T designated as race cars. Like the T/R, the S/T designation was an in-house Porsche amalgam of existing model identifiers: an S engine and the lighter T chassis.

There was far more going on with the S/T than just an increase in swept capacity. Wider wheels and tyres for enhanced grip required flared wheel arches front and rear. The solution was a fascinating mash-up of materials. For example, on the early S/T, the front wings, bonnet and bumpers were made of fibreglass, the rear quarters were steel, while the doors and engine lid were constructed from aluminium. Aside from the windscreen, all windows were acrylic. The rear three-quarter panels, roof and rear seat-pans were made from thinner-than-usual steel, while all extraneous fixtures and fittings were left out, from glovebox lid and ashtray to front and rear lid locks, door and bumper trim strips. There was no sound deadening or floor mats. Even the paint was thinned down.

FLARING OF THE WHEEL ARCHES AND THE WAY THE FRONTS MARRY UP SO BEAUTIFULLY WITH THE BUMPER AND VALANCE

Apart from a front strut brace, 908/2 brake calipers and a competition fuel tank with a central bonnet filler cap, the running gear was little changed from the stock 911 S. Visually, the most obvious indicator of the ST's identity is the difference in wheel types — since Fuchs did not yet produce rims boasting nine inches of width, Porsche had to look elsewhere. It found what it needed at Minilite. The company's eight-spoke competition wheels, ubiquitous in contemporary touring car racing, were not only available in the desired size, but they were made of sand-cast magnesium, which is lighter than aluminium.

FRENCH LEAVE

Looking back at the 24 Hours of Le Mans is an excellent guide for seeing what race cars were on the scene at any particular time. In 1970, four of the eleven 911s running in the daylong French enduro were S/T specification. The 2.3-litre Ecurie Luxembourg entry, sporting no.47 down its flanks and driven by Erwin Kremer and Nick Koob, was the only finisher, placing seventh overall. Meanwhile, an S/T dressed in the well-known (and often copied) swirling psychedelic red-and-yellow livery inspired by the Shell Oils logo was built for the 1970 XVème Tour de France Automobile. It finished third overall at the hands of Gérard Larrousse, who encouraged Porsche's engineers to ditch even more weight from the S/T than they already had. As a result of his powers of persuasion (the promise of champagne may have helped), they dropped a scant eight hundred kilos by another twenty.

Larrousse was leading the event until a clutch complaint on the final day of the tournament saw him drop to third overall. Even so, this particular S/T has gone down in history as the lightest 911 ever built. The following year, however, was arguably the S/T's heyday,

Facing page Influence from the look of 911s in motorsport is clear to see when eyeballing this Blood Orange restomod

when there were nine S/Ts out of eighteen 911s running at Le Mans. Raymond Touroul and Andre Anselme drove the Cachia Bundi entry to sixth overall and first in class.

S/T specification shifted for 1972. Appendix J permitted only the 911 S's fibreglass front bumper, complete with embryonic airdam, to be used on the competition car. Ahead of the season, a number of 2.5-litre 911 S coupés were built for racing under option M491, bearing the same chassis numbering as the standard 911 S, though for this reason it's not easy to say exactly how many were created at the factory and how many were subsequently fettled to S/T specification by private teams. It's also worth noting it's only retrospectively this group of cars has come to be known as S/T — Porsche management discouraged the identifier at the time, though it was the preferred designator within the Weissach research and development centre.

intriguing about the S/T is the flaring of the wheel arches and the way the fronts marry up so beautifully with the neighbouring bumper and valance. And, of course, there's the rather heroic swell of the rear wheel arches. Having indicators in the wings also adds to the S/T's charisma.

The interior cladding of the M491 cabin was black, with simplified door panelling. Furniture consisted of Recaro bucket seats with leather sides and cloth centre sections, criss-crossed by four-point harnesses anchored from the rear bulkhead. A smaller 380mm four-spoke steering wheel was fitted and lightweight door linings featured thong openers and manual window winders. There's no clock and the rev counter is in the conventional position, rather than being upside-down, racer-style. Obviously, the door pulls pre-date those in the RS.

S/Ts were delivered with Weber carburettors, but could later be specified with Bosch mechanical fuel injection. S/Ts also made use of custom camshafts and

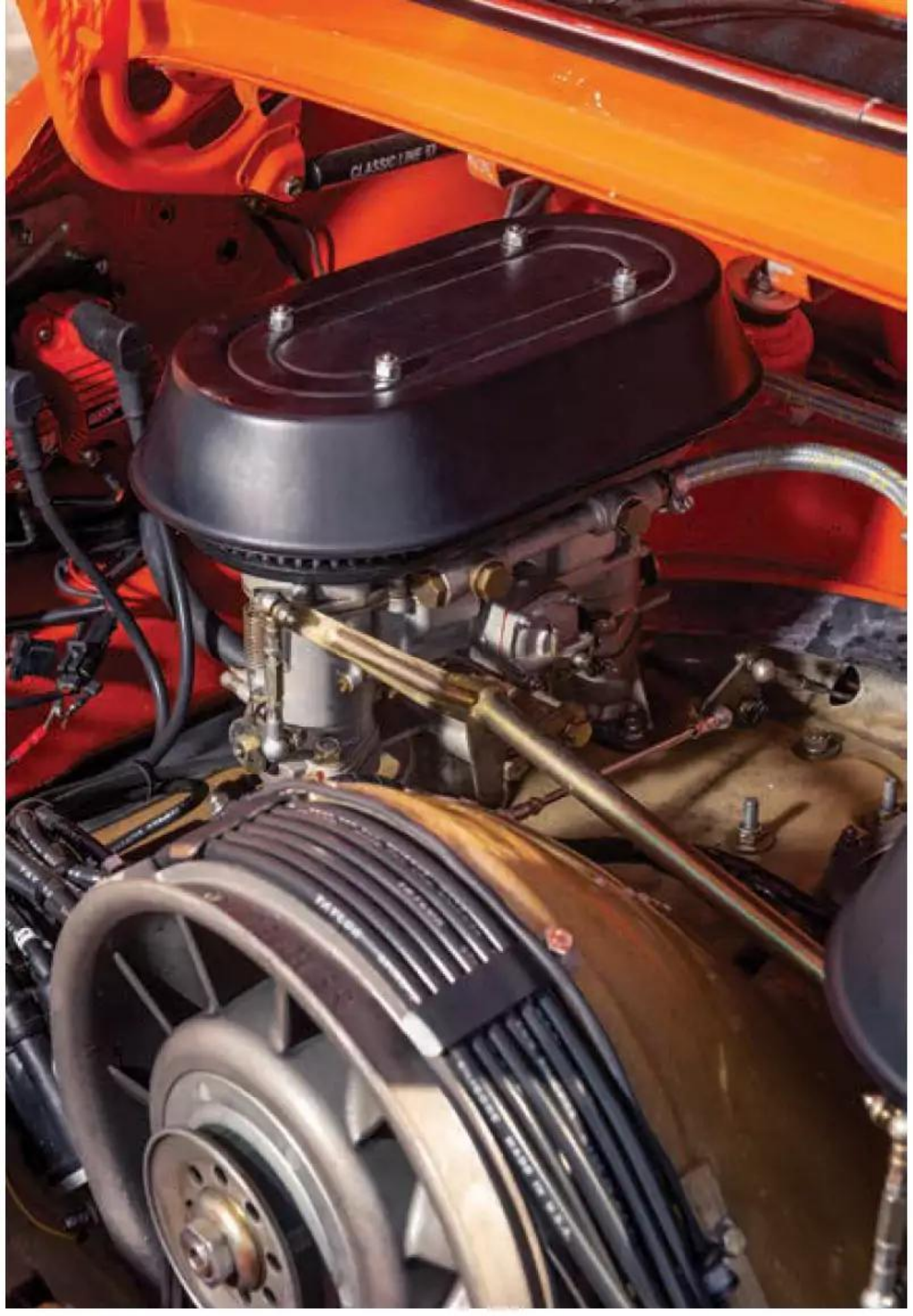
Above When viewed side-on, the car's fat tyres make it look like a Hot Wheels model

NEXT IN LINE

These 1972 S/Ts were fitted with bigger bore (86.7mm x 70.4mm) 2,492cc competition flat-six engines (Type 911/70) and were assigned a special serial number group, coupled with uprated gearboxes with improved cooling and full pressure lubrication. Suspension modifications included new anti-roll bars and harder Bilstein shocks. A half roll-cage was located in the rear of the stripped-out cockpit. Importantly, there were significant differences in panel composition to the earlier S/Ts — except for the front spoiler, the rest of the body panels were fabricated in steel or aluminium, including steel front wings and an aluminium valance between the deleted overriders, adding up to a given weight of 1,025kg. Stylistically, what's









Facing page Three-litre engine has been rebuilt and lifted to 3.2 litres of displacement

Below Fueling and ignition systems have been overhauled, enabling power of 270bhp at 6,000rpm

pistons, each engine blueprinted with polished intake and exhaust ports, plus the aforementioned twin-spark dual ignition system. In this specification, the 2.5-litre engine developed an impressive 270bhp at 8,000rpm. The S/T was priced at DM49,680, which was getting on for a heady £30,000 in 1972. To put this in perspective, back then, that sum could have bought you a couple of houses.

Enough of the history — let's take a look at the car on these pages. It's based on a healthy, undamaged, rust-free 911 SC from 1981, complete with matching numbers engine and gearbox, plus optional Type 220 spur-gear differential. Bilstein dampers and RSR-specification torsion bars are at play. The original SC anchors have been swapped for the larger calipers of the 911 Turbo (930) to ensure appropriate stopping power and have been allied with new discs and pads. The rear arms are modified to accommodate the bigger brakes.

THE BODY HAS BEEN BACKDATED, STARTING WITH THE REAR QUARTERS, WHICH HAVE BEEN FATTENED WITH STEEL FLARES

The three-litre SC engine was totally rebuilt as a short-stroke 3.2-litre flat-six, using new Mahle barrels and JE forged pistons, plus new bearings, larger oil pump gears and chains. The cylinder heads were rebuilt and converted to twin-spark units with gas-flowed ports. Rally camshafts were fitted, along with CP Carrillo connecting rods, new head studs, a lightweight flywheel, as well as a beefy Sachs clutch and pressure plate. The electrical system incorporates the new dual ignition with MSD 6AL control modules. The oil cooler on the engine block was equipped with an additional filter in the manner of the RSR, while fuelling is aided by a Weber adjustable fuel pressure regulator and forty-six-millimetre PMO carburettors topped with K&N filters, the regular classic option. Indeed, PMO's products have been the go-to choice for 911 enthusiasts since its first batch was launched in 1997. Interestingly, PMO is the original manufacturer of 911 carburettor conversions and the only business dedicated exclusively to producing equipment for the upgrade — the PMO triple throat carburettor improves considerably over the original Weber carburettor and manifold design adopted by Porsche in period, resulting in increased power, as well as improved drivability by way of smooth and progressive throttle response.

The engine and gearbox were installed on Wevo semi-solid mounts to minimise powertrain heave in hard cornering. There's also a Wevo short-shift kit for tighter gear changing. Poking out from the rear is a Dansk exhaust system, appropriately loud, sending the









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Above Dave has put his stamp on the car by replacing black brightwork with silver parts

noise through stainless-steel three-branch manifolds, silencers and heat exchangers. The body has been backdated from G-model to F-model, starting with the rear quarters, which have been fattened by having steel S/T flares grafted on. The front wings (fenders in US parlance) are carbon-fibre replica S/T parts. The F-model front lid is also manufactured from lightweight weave. Beneath it lies a hundred-litre fuel cell with central filler neck, accessible via the bonnet cap and an essential manifestation of the period S/T. The oil cooler is also housed here to assist with cooling the 3.2-litre flat-six. The S/T pastiche is finished in glorious Blood Orange paintwork, the ensemble set off by the distinctive period-look PAG Campagnolo from Group 4 Wheels shod with new Michelin TB classic radial tyres.

The cabin interior is embraced by a full Heigo roll cage, with removable front section if the car's owner, Dave Lewis, decides it isn't required. The BF Torino racing seats are partly upholstered in leather and partly in cloth, enfolded with Schroth harnesses. The dashboard features a leather-trimmed F-model gauge binnacle housing overhauled clocks and gauges, while the deep-dish MOMO steering wheel charmingly features a Rennline hockey-puck horn button of the style fitted to original 911s. It's fine for road use, but droll in a racing scenario.

The build, which was carried out in the Netherlands, cost in the region of €150,000 in parts alone. Dave was lucky to find it — it seems the specialist who started the transformation and acquired all the necessary components had to check out of the project at short notice. He passed the car to a fellow Porsche restorer, who completed the work. Dave took ownership in September 2021 and drove the car to his home in the UK, where it joins his Aga Blue 912 (featured in the December 2023 issue of *Classic Porsche*) . "After restoring my early 912 back to original factory specification, I wanted a rawer and more powerful classic Porsche. I've always loved the look of the S/T over the Carrera RS 2.7, but have been far fewer S/T backdate projects over the years. I reasoned I'd have to build my own." The aftermarket has worked wonders to provide owners of mass-produced 911s with all the equipment they need to turn their air-cooled classics into S/T replicas. The seldom seen race car has also provided the blueprint for many signature models produced by some of the best-known marque-specific restoration houses. And, of course, the S/T look served as the starting point for Singer Vehicle Design's series of bonkers-spec 964 backdates.

LUCKY BREAK

"I was planning to work closely with Mick Pacey at Cranfield-based marque restoration and sales specialist, Export 56, in the hope of developing an S/T replica from scratch," Dave continues. "We were looking at potential donor cars when this one suddenly became available. I jumped at the opportunity to take ownership — this is exactly the S/T evocation I had in mind. Even though the car was pretty much done, there remained scope to put my own ideas into it. I should stress, I never wanted an exact S/T recreation, just a really cool 911 taking heavy influence from the S/T aesthetic."

Export 56 might not be responsible for the build, but Mick's team takes care of servicing, maintenance and modification of the car now it is in Dave's possession. For example, he immediately asked Mick to swap the black engine lid grille with a silver part. More fundamentally, Export 56 also rebuilt the transmission, altering the gearing and fitting a new input shaft. JPS Motorsport in Bletchley carried out full suspension and chassis tuning. For engine setup and balance of the PMOs, the car visited the rolling road at Marlin Motor Engineers (also in Bletchley), where it delivered 270bhp at 6,000rpm. Needless to say, Dave is keen to get the most out of this stunning 911, including using it to learn how to drive an air-cooled 911 in earnest. To this end, he plans to use the car on regular track days and tells us it is likely to be driven to major historic motorsport events, both at home in the UK and abroad.



Above 911 G-body becomes F-body with this fantastic backdated SC, which Dave bought in the Netherlands

We're in the presence of such a distinctive car that, inevitably, at least one precedent springs to mind — this S/T evocation is one of the most comprehensive builds we've covered, vying with a similar 911 produced by the doyen of Porsche tuners, Alois Ruf Jr, who created an S/T replica for one of his discerning clients. Inspired by the winning 911 R from the 1967 Marathon de la Route, the RUF-readied Porsche came out looking not so much like an R, but an S/T, since it was able to present slightly more user-friendly specification. Alois calls these backdates 'neo-classics', a very apt term for a recreation.

THE S/T PASTICHE IS FINISHED IN GLORIOUS BLOOD ORANGE PAINT, THE ENSEMBLE SET OFF BY THE PERIOD-LOOK WHEELS

ZEST IS BEST

The RUF-built car was based on a fully restored 1969 two-litre 911 E and was similarly finished in Blood Orange, with bigger barrels and pistons taking it up to 2.8 litres of displacement, with twin-spark ignition and a 10.3:1 compression ratio, fed by Weber carbs and chucking out about 250bhp. It had a five-speed manual gearbox, plus limited-slip differential, running on deep-dish fifteen-inch Fuchs with seven inches of width at each corner. The wheels wore 185x70 profile tyres at variance with the traditional wide rear Minilites, which 911 S/Ts are known for. Closure panels were made from light steel, resulting in kerb weight just shy of nine hundred kilos.

And what about the S/T driving experience? In the case of Dave's car, the 3.2-litre motor inevitably means it's torquier than a 2.5-litre S/T, though power output is in the same ballpark. It's lightweight, and this undoubtedly helps, enabling a vigorous set-to where dynamics can be explored to the full. The later S/T and the 2.8-litre RSR are pretty close in the way they perform, though the S/T is less rigid. In fact, I would say the S/T is more like a raw Carrera RS 2.7, the way it writhes under hard braking and twitches at the slightest hump, while its nose explores every nuance of the road ahead's surface, however smooth.

It's a hectic ride, but optimum control comes by simply being the guide rather than the hustler. The steering is light, requiring a deft touch rather than brute force, and lock is not bad, considering the girth of the tall Michelins. This 911 is beautifully set up and easily controllable, with pinpoint turn-in ensuring I can place it exactly where I want. It responds gamely as I ease on the loud pedal.

Acceleration is sharp, from 2,500rpm right around to the redline. It's an aural delight up around the top end, where I'm using third and fourth gears. Down to second for tighter bends, surging from corner to corner in a glorious six-pot shriek. The short-shifter's gear knob produces a decidedly metallic sensation in the hand, but it's niftily precise at slotting from notch to notch. And those 911 Turbo brakes ensure braking is as secure and effective as possible.

Few other classic 911s present such a purposeful stance and no-nonsense attitude. Even fewer evoke such an aching nostalgia for the purity of halcyon days, pre-Turbo, pre-aero, when tweaked engines and light weight were principal enhancements. The S/T is the model which established a foothold for the 911 on the international competition ladder. It's easy to see why it earns a crucial place in the evolution of Porsche motorsport machines. Good on Dave Lewis for promulgating its reputation with his outstanding orange evocation. ✪

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Rocker panel trim, outer, left



Fits: Porsche 911 Turbo (3.3) '77-'89

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Rocker panel trim, outer, right



Fits: Porsche 911 Turbo (3.3) '77-'89

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Dashboard, upper part. With air nozzles



Fits: Porsche 911 (2.0-2.7) '68-'73 // Porsche 912 (1.6) '68-'70

Dansk no. 590922-1 // JP no. 1684001600

Dashboard, lower part. With holes for instruments



Fits: Porsche 911 (2.0-2.7) '68-'73 // Porsche 912 (1.6) '68-'70

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EUI 993

NEW LIFE

The devil, they say, is in the detail. Perhaps this is why we've become fixated with the indicator and windscreen wiper stalks on this build — dubbed 993 R — from the Paul Stephens Autoart label?

Words **Steve Bennett** Photography **Paul Harmer**

They look standard. That is to say that they look largely like the lightweight plastic stalks of any 993 or Porsche of the same generation. To the touch, however, they are cool, metallic and operate with slick precision, rather than a plastic click. This is because they're machined from aluminium in order to be a tactile treat. I like the fact they could have been 'blinged' up to emphasise the point, and that a vast amount of time and trouble has gone into what is a mundane piece of interior functionality, but the feel is enough. Understated is the word. It suits this build perfectly.

There's more. The usually plastic rotary controls for the lights and the equally flimsy switchgear for the ventilation and air-conditioning may look standard, but they're machined from aluminium and anodised in black, the function of each control engraved, rather than printed. We know all about the 'three Ps', but this is the 'three Ds': detail, detail, detail. And it all bodes well, because if this is the effort invested into minor interior componentry, then what about the rest of this car? I've been following the build for the best part of five years. From a bare shell to its current finished form, this personalised 993 has been a long time coming, but for good reason. The mission statement? To build the very best 993 Carrera and then improve on it by twenty-five percent. Why a 993 and not a 964? Well, if you want to build the ultimate air-cooled 911, then starting with the most evolved version of the air-cooled 911 is the best starting point, surely? So thinks Paul Stephens, the marque specialist charged with building this Porsche, which has been released under his Autoart brand.

Paul has history in the game of bespoke 911s. I was the first scribbler to drive his 911 SC 240 R hot rod and 964-based 300 R way back in 2005. These cars captured what the market was all about back then: taking largely unloved and unsaleable G-series and 964-generation 911s and giving them a new lease of life. I'm talking about the days when a bronze-coloured, Pascha-trimmed 911 SC or an oil-incontinent 964 was worth about seven grand of nobody's money.

The 300 R is the distant ancestor to this 993 R build. At the time of the older 911's assembly, in what was a formative market, cost was certainly a factor. Just how much were folk willing to pay? Now, of course, we live in a Porsche world known for builds by Singer Vehicle Design, Gunther Werks, plus no end of pretenders. We know there is effectively no upper limit when it comes to spend. Almost two decades ago, fifty grand was the figure I quoted, and that was all inclusive. Then again, as I've just outlined, this was when a donor car could be acquired for a relatively low sum. The market has moved on. Indeed, there is now seldom talk of donor cars, just complete cars. New cars, even.

The 993 R is where today's market is at. To be clear, this isn't a backdate, retro, restomod or whatever else you want to call it. It's a car which stands alone, a model in its own right. Its original underpinnings are almost irrelevant, such is the reworking of Porsche's period specification. Sure, a factory-built 911 in the 1980s would look hand-built compared to a current-generation 911, but this Autoart car genuinely *is* hand built. Virtually every component has been rethought, reworked, remanufactured. And, thus far, it's a one-off.

LIFT THE ENGINE LID AND WITNESS THE CUSTOM FAN SHROUD AND TOWERING GT3 PLENUM STACK

PIECE OF THE ACTION

Lift the engine lid and witness the custom fan shroud and towering GT3 plenum stack, which straddles fuel injection throttle bodies feeding fuel and air to the hungry 330bhp, 3.8-litre flat-six, packed with lightweight moving parts from Porsche's motorsport division to facilitate a near 8,000rpm redline. Think barrels and pistons from a 993 RSR, lightened con-rods and bespoke camshafts. Think 997 GT3 oil pump, crankshaft and bearings. The eighteen-inch second-generation 996 GT3 wheels are booted with Michelin Pilot Sport 4 rubber and conceal 993 RS brakes and TracTive dampers (much more on these later) with five separate electronically controlled settings. Porsche Motorsport suspension arms have been selected for maximum adjustability.

The quality of the panels, the de-guttered, seam-welded bodyshell and the paintwork is beyond reproach. This is the crucial starting point, because only when you have taken everything off, can you decide what you're going to put back on. The answer was, well, not a lot. Not much of what this 993 Carrera left the factory with, anyway. In fact, almost nothing at all. Donor car? More like donor shell. Electric mirrors and power windows? Gone. Central locking? Don't need it. Wiring is pared

Facing page Got four hundred grand to spare? If so, an Autoart 993 R could be yours



down, the air-conditioning system is lightweight and the glass is thinner. This is how weight has been dropped to just 1,220kg.

A shout out here to Paul's long term collaborator, Mark Walklett of Ginetta fame, whose composite work has made possible the modern take on the ducktail wing (complete with its horizontal satin black slats), a diffuser flanked by twin exhausts and the bespoke front and rear aprons with cooling ducts. The body is subtle in Polar Silver. It's modern, effective and categorically no Rennsport pastiche. It gets attention, too — Porschephiles appreciate the understated look. It is the antithesis of a Gunther Werks or Singer build.

AS DEVELOPED AS THE 993 MIGHT HAVE BEEN, ITS BASIC BODY AND CHASSIS COULD BE TRACED BACK TO THE 1960s

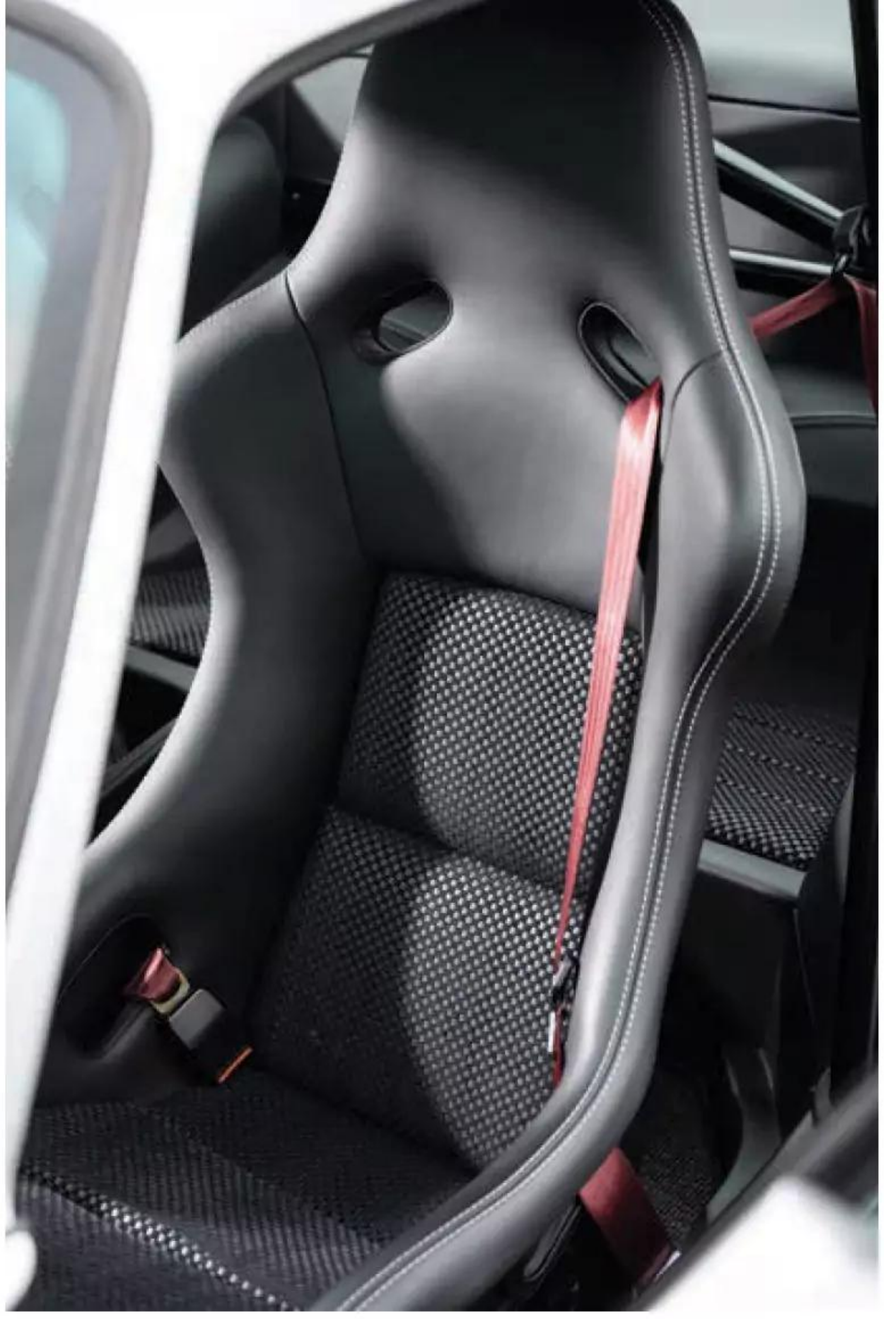
Back inside and the 993 R goes beyond mere restoration. Whole swathes, such as the dash top and door capping, are remanufactured, chiefly because the originals are too old and distorted to be reused. Other interior trim is clearly custom-made, including the centre console and sill covers, which morph into the footwell panels, where machined footrests reside. The underneath of the dash is cleanly panelled. Then there's the Recaro carbon fixed seats, boasting leather wings and bolsters set against black lattice-weaved inserts. The rear of the cabin, which features custom seat cut-outs, is similarly custom panelled and trimmed.

And it continues. Check out the remote key fob, which like those of modern Porsches, is moulded in the shape of the car it belongs to. In the vein of a modern fob, it actuates the central locking and frunk, which reveals a custom-panelled luggage area when lifted. No saggy old carpet trim here. While you might consider the leather-covered fuse box a little decadent, there's no denying it's a classy, custom touch.

Time to drive. I've been lucky enough to put extensive mileage on this new build, from commuting out of London and motorway cruising, to rural B-road bashing. Today, to do justice to the dynamic abilities of the 993 R, we've come to Blakey Ridge on the North Yorkshire Moors. A more testing workout for a car and chassis I have yet to find in the UK. This area's challenging, twisting yumps and bumps are regularly used by manufacturers and us magazine folk. Without wishing to sound like a massive show-off, I've driven most varieties of Porsche up here, from 944s to the Carrera GT and every kind of 911 in between. Many have been exposed for just not being fit for British backroads, where compliance is crucial and anything too stiff or track biased is simply out of its comfort zone.

Before we set off, a word about the engine. Rather like the chassis, it's all too easy to get this aspect of a build wrong. Power is the easy bit. Drivability? Less so. That this collection of parts works is testimony to the in-house engineering team at Paul Stephens, as well as the art of engine management system programming. Too many times we've driven cars where the mapping works

Above Extensive composite work keeps weight in check at 1,220kg and gives the car its unique look











Above Interior is a work of art and includes anodised metal steering column stalks, which look identical to the OEM plastic parts they replace

with the taps open, but pops, bangs and kangaroos on part or trailing throttle. On this point, you might consider 330bhp a tad conservative for the money. Initially, Paul and the team must have thought so too — with hotter camshafts, an earlier iteration of this engine delivered a peaky 360bhp. I know as much because I tried it. Like so many normally aspirated engines chasing big power figures, the power was there, but it came in at the top end, leaving the bottom and midrange less than tractable. It's commendable, then, that drivability became the goal, because outright speed matters much less than feedback, body control, linearity of engine response and connected mechanical feel.

Funnily enough, the power-to-weight figure at play here is exactly that of a 996 GT3, which, to my mind, is just about perfect. Enough to feel fast on the public road, but not as to be effectively unusable, like any current, bloated-in-power-and-size Porsche GT. That said, Paul and the team will continue to develop the hotter flat-six. Watch this space.







ACE OF BASE

A mighty engine is nothing without a mighty chassis. I hold my hand up here as someone with an obsession for the art of chassis tuning. No, I don't consider myself to be some sort of development guru, but I know what works, what I like and, crucially, I know UK asphalt is rather different to the roads you'll find in mainland Europe. A setup that works in Blighty is a very specific thing and difficult to achieve. It certainly doesn't come in a box. Oh, and we've mentioned in passing the seam-welded bodyshell, but not so much the significance of it, plus the welded-in half-cage and strut bracing. Put simply, the stiffest possible shell allows suspension and steering to work effectively in controlling the mass and movement of the car, with no influence or flex from the body. With the best will in the world, as developed as the 993 might have been from the factory, back in the early to mid-1990s, its basic body and chassis could still be traced back to the 1960s. Enter TracTive suspension. Paul and his team, in collaboration with Steve Bennett at 64 Tailored Performance (TracTive's UK distributor) and chassis tuner, Center Gravity, have developed this particular electronic semi-active damping kit for the purposes of their own projects. Based around one of TracTive's Active Control Electronic (ACE) systems, each damper delivers millisecond-fast Dynamic Damping Adjustment (DDA), to use TracTive parlance.

As mentioned earlier in this magazine, the ACE/DDA combo allows control of front and rear damping, mid-corner roll and pitch during corner entry. Five different damper settings can be programmed and stored, each available with quick turn of a five-way rotary knob, though TracTive offers a full-colour touchscreen user interface as a cost option. The permutations are almost endless, but for the purposes of the 993 R, we're working with pre-configured settings ranging from comfort to track, with variations in between.

Regular readers will know we've sampled TracTive suspension on other 911 builds, including Everrati's 500bhp 964 EV, the 964 Carrera 2 formerly owned by TracTive UK boss, Steve Bennett, plus the fabulous KAMM Manufaktur 912 C. All were positive experiences and a leap forward in chassis technology.

TracTive's DNA can be traced back to celebrated Dutch motorcycle damping specialist, WP Suspension, a major player in top-flight two-wheel motorsport. In 2010, TracTive was established, promptly becoming an OEM development partner. Thanks to 64 Tailored Performance (in conjunction with many independent Porsche specialists and professional chassis tuners), there is now a broad understanding of the unique damping requirements for Porsches on challenging British roads.

TracTive's standalone Active Controlled Electronics (ACE) system monitors real-time driving parameters, using lateral and longitudinal acceleration to observe behaviour on vertical, lateral and longitudinal axes. Inside each ACE damper is a patented Dynamic Damping Adjustment (DDA) valve. This valve is controlled by a sensitive multi-axis g-sensor and advanced algorithms developed from decades of racing and road testing. A dynamic proportional valve operating as a bypass has capacity for a large range of damping adjustment and is capable of responding between six and ten milliseconds. You can adjust roll and pitch interference for stable braking, controlled corner entry and, after hitting the apex precisely, better acceleration out of the corner. Little wonder a classic 911 chassis can suddenly feel very modern, particularly in terms of body roll and stability.

SMOOTHING OUT THE ROAD SURFACE, FILTERING OUT THE TYRE ROAR, TAKING UNDULATIONS AND COMPRESSIONS IN ITS STRIDE

As intimated, five different suspension maps can be created using the system software. Each setting can be selected by way of a rotary knob or touchscreen display. The advantages are obvious: comfort and cruising to the track and, within five clicks, an aggressive circuit set-up or fast-road option. A game changer? We think so.

R-ACE combines all the benefits of ACE technology with the addition of secondary low- and high-speed compression adjustments, which are tuned for the application and motorsport discipline. The low- and high-speed compression adjusters can fine-tune damper characteristics to find the perfect balance for individual track setup, driver preferences and race pace improvements. The compression adjusters can be located remotely, piggy-backed or mounted in-line

Above 330bhp engine's redline is set at 8,000rpm, while power-to-weight ratio matches that of a 996 GT3



AUTOART 993 R







Above Second-gen 996 GT3 wheels shield 993 RS brakes

Below New details are waiting to be discovered every time you take a fresh look

with the dampers. As the name suggests, R-ACE is best suited for extreme race and endurance applications. It's the very pinnacle of what is currently possible using suspension knowledge gained from decades of racing at the highest level. And so, to put it all together. Here's the weird bit. This is a 911 of the 993 variety, but it sure doesn't feel like one. It feels a like a standalone 911, the version which would have come next, had the water-cooled revolution not killed off air-cooled production. A standard 993 on these roads is revealed for the classic it now is — a bit creaky, a bit wallowy, easily diverted and at times a little breathless on the longer drags. Should this come as a surprise? Probably not, given the platform, weight and the bespoke nature of the chassis and the engine. In contrast, the 993 R is a car you can relax and be absorbed into. You feel connected, reading the road directly through the steering wheel, picking up on the movement of the body and chassis. Despite its engine being slung out the back in true 911 fashion, the mass of the car feels centred around you.

The penny starts to drop. The way the chassis and suspension play out on these tough North Yorkshire roads, smoothing out the road surface, filtering out the tyre roar, taking undulations and deep compressions in its stride, is almost Lotus-like. Nobody understands how to configure a chassis for UK roads as well as the boys from Hethel. Interestingly, Paul's other great passion is Lotus (he's waiting for his new Emira to be delivered). Perhaps it's a subliminal thing. Is this what a 911 would feel like sprinkled with Lotus magic? I reckon so.



TIGHTENING GRIP

Running the chassis at three clicks seems to be the perfect setting here. The dampers, springs and wheels work with the road, rather than against it. Grip from the Michelins is mighty on some of the longer sweeping corners, while fiddly corners, dips and bumps are easily dealt with. Power is bang where you need it, starting at 1,500rpm and redlining at close to 8,000rpm, with peak 330bhp at 7,400rpm and, perhaps more significantly, 265lb-ft torque at 5,675rpm. The broad power band is perfect for the road, giving you options and rapid response thanks to the lightweight internals and flywheel. Oh, and there's an excellent Wavetrac limited-slip differential fitted to aid with propulsion. The standard 993 six-speed gearbox has been retained, but with ratios sensible for road use, not eco-long as favoured by modern Porsches. The shift is perfect to slice through the gate — Paul and his team have resisted the temptation to go notchy and short shift.

The noise? Well, it's important, innit?! A tweaked Cargraphic exhaust system produces a smooth, cultured tone suiting the look and image, but visceral and absorbing when really wrung out. Blown away? Yep, but why not?! This 911 development pushes all my buttons



in a very good way, most notably how it is perfectly in tune with UK roads and also for its delivery of usable power over peak power. As a little aside, helping us out here on Blakey Ridge for tracking photography (in his BMW M5 Touring), is *Classic Porsche* reader, Andrew Maude. I mention this, because Andrew drives these roads every day and is a long-time 993 owner and fettler. From the passenger seat, he is blown away by the amount of chassis control exhibited by the 993 R.

Better than a Singer? In terms of engine and suspension, certainly better than one of the California brand's 964-based 'Classic' reimagined 911s, but then the 993 R has a more sophisticated chassis to start with. Looks, obviously, are subjective, but give me understated over trinkets and bling any day. If this was some sort of forum, I'd probably get flamed for that one. Is the 993 R better than a Gunther Werks 400 R? That's a tough one. I can't go into too much detail here, but I've driven both the 993 R and 400 R on the same day and same roads. Again, I'd take the Paul Stephens build, which isn't as savage or stiff. Obviously, all three 911s draw attention, but in the 993 R, it's likely to be from Porschephiles. The Gunther Werks car, meanwhile, proved popular with van drivers.

There are elephants in the room. Currently a bespoke one-off development, the 993 R could remain this way, although I highly doubt it, given this 911 is a desirable and very viable alternative to others in the same category of Porsche. Cost? We have to go there, don't we? Let's get it over with: £400,000, plus donor car. Crazy? That's what it takes these days. Granted, you could have any number of off-the-shelf Porsche GTs or RSs, but to do so is to entirely miss the point of this project: a Paul Stephens customer realising the idea of his perfect Porsche.

You could argue he's rather bravely put it out here to be judged. Besides, having watched this five-year build from bare shell to complete package, I suspect rather more than four hundred grand went into its development. You can't put a price on the additional manhours, occasional blind alley and U-turn these sorts of projects throw up. Naturally, subsequent builds will reap the benefits of this hard-won experience, but they won't be the same. A bare shell is a blank canvas, after all.

SHORT OF A SINGER DLS, I HAVEN'T DRIVEN AN AIR-COOLED 911 WHICH GETS UNDER THE SKIN QUITE LIKE THIS

How to sum up this stunning machine? A game changer might be a bit OTT, but short of a million-pound Singer Design and Lightweighting Study (DLS), I haven't driven an air-cooled 911, factory or otherwise, which gets under the skin quite like this. For more of a comparison, I would have to fast-forward to my favourite modern 911 chassis duo, that twosome being the original 997 GT3 RS and the 997 Sport Classic, both of which would feature on my Desert Island race track for their quality and precision, feel, damping control, feedback, delivery, noise and flat-six scale.

Not a bad effort, then, from a modest workshop on the UK's Essex and Suffolk borders. I can't wait to see what rolls out of it next. ✪

Above Building a 911 this focused is one thing, but perfecting the ride for UK roads is quite another

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TRUE NORD

This 964 Carrera 2 backdate has been meticulously pieced together by Carrera Classic, the Finland-based air-cooled 911 specialist creating a name for itself on the historic Porsche motorsport and restoration scenes...

Words **Dan Furr** Photography **Chris Wallbank**

The day started so well. Everything was going according to plan. I'd left my home in Norfolk nice and early, hopped into my 968 Sport and set the controls for the heart of Hensall, near Leeds, the home of my long-time collaborator, Chris Wallbank (automotive photographer extraordinaire). The plan was to pull my luggage out of the 968, chuck it in the back of his Audi A6 and head for Manchester airport, where we were due to board a Finnair flight to Helsinki. I'd left Norfolk with plenty of time to spare, allowing us to look forward to a relaxed journey.

Unfortunately, I'd failed to remember how the pandemic erased driving ability from the mind of most motorists. Seriously, it's as though the majority of drivers emerged from lockdown completely unable to remember how to control their car. Don't get me started on their lack of command of basic highway safety. Undertaking (passing on an inside lane) is now a common sight on every motorway journey I undertake, middle-lane hogging is rife, and it's now not just BMW drivers who don't know how to operate their car's indicators. Okay, I'll admit, alongside my Porsches, I own a Bimmer (a 1997 E31 840ci Sport Individual in Estoril Blue, in case you were wondering), but you get the point. Take dangerous driving behaviour and throw in the abysmal state of Britain's roads — unforgivably large potholes on multi-lane motorways are bad enough for cars, but are a potential death trap for motorcyclists — and anybody wanting to travel distance across the UK without incident should prepare for regret and disappointment.

And so it proved, not once, but twice on my journey to Chez Wallbank. The first major incident occurred halfway up the A1, near Newark. Traffic was at a standstill for more than ninety minutes, which would have been somewhat more tolerable had it not been one of the hottest days of the year, on which I'd decided to drive a Porsche lacking air-conditioning. The 968's cabin was a furnace. Mercifully, I was on the move before melting, but by this point, much of the 'wriggle room' I'd factored into my journey was lost. "Not to worry," Chris assured me, although I could tell he was slightly panicked, such is the disposition of someone who knows they have to navigate not only the M62 motorway, but also the dreaded M60, with rush hour fast approaching. When I finally arrived in Hensall, we hurriedly emptied the Porsche's contents into the Audi and set sail for the airport. Panic over. Well, until just eight miles out, where all three lanes of the M60 were closed to due to an accident. This meant *all* motorway traffic was being redirected through narrow roads in and around Oldham. The clock was suddenly ticking very loudly.

Thanks to sly manoeuvring from Chris (doubtless the perfect getaway driver, should I decide to rob a bank), who weaved the Audi in and out of largely stationary traffic, we clawed back a little time, but as the deadline for baggage drop at the airport drew uncomfortably close, we realised we'd need to leave our suitcases in the car and run to the departure lounge with our carry-on luggage, amounting to cameras and our laptops — we reasoned we could buy clothes and toiletries at our destination, a short drive from Vaasa, a small city on the west coast of Finland.

BOTH CHRIS AND I KNEW THESE EFFORTS WERE IN VAIN, EVEN IF WE DIDN'T WANT TO SAY IT OUT LOUD

Three miles. A frustrating three bloody miles. This is how close we were to Manchester airport (an absolute craphole, best avoided) when check-in closed. Naturally, I'd been liaising with Finnair customer service operatives to find out if there was any way they could hold the flight until the very last minute, but both Chris and I knew these efforts were in vain, even if we didn't want to say it out loud. There was only one thing for it: as it became painfully apparent there was no way we had time to make it to the airport, park the car, run to the terminal and board our flight, we pushed our entire trip a day, a change attracting a financial penalty greater than the cost of our original booking. The Audi did an about-turn and we returned to Hensall, by which time I'd been on the road no fewer than nine hours. Incidentally, our intended flight departed long before we managed to complete those troublesome three miles.

I'm delighted to report the following day's trek was relatively hassle-free, save for the inevitable build-up of traffic and the aforementioned lunacy exhibited by our fellow road users. Even the man who lives on the M62 seemed to be in good spirits, which is saying something, considering he has six lanes of heavy traffic passing through his garden.

Why were we subjecting ourselves to such torment? Hidden deep in the forests of south-west Finland lies the

Facing page CC1 is the first bespoke backdate from Carrera Classic, with CC2 currently in planning phase



workshops of Carrera Classic (visit *carreraclassic.fi*), a family-owned business specialising in the restoration and sale of air-cooled Porsches. Stuttgart-crested cars are a rare sight in this part of Europe, where car culture is a bizarre mix of old Volvo estates and 1950s Americana. Proving the point, the combined follower count for all of Porsche Club Finland's social media profiles amounts to less than three thousand interested parties, the majority being Porsche enthusiasts, rather than Porsche owners.

In this small-but-significant concentration of Porschephiles, the husband-and-wife team of Jussi and Raili Itävuori are well-known, but their passion for Porsche extends beyond Finland's borders, not least because following retirement from his career in human resources ("essentially, I spent my working life hiring and firing"), Jussi decided to become a racing driver. Indeed, his Guards Red two-litre 911 has become a mainstay of the celebrated Peter Auto 2.0 Cup and, with Raili's support (emotionally, financially and very much hands-on in the pit-lane), man and machine are going from strength to strength, taking the fight to seasoned professionals supported by big money, major sponsors and teams well-versed in the field of historic racing.

We showcased this special race car in the January/February 2025 issue of *Classic Porsche* — the purpose of Chris and I visiting Carrera Classic is to sample each of the finished restorations currently in the Itävuori stable. Ranging from a 1955 356 Pre-A Cabriolet to a 964 Carrera 2 backdate, the collection is exclusively air-cooled, although Jussi admits to flirting with Porsche's later output by way of time in charge of a 997 GT3 RS 4.0, which he parted company with in order to create space for a much older 911. On this point, Carrera Classic's focus is primarily on 911s from the mid-to-late 1960s, as Chris and I have been demonstrating across successive issues of *Classic Porsche* following touchdown in Finland.

THE DONOR 911 LANDED WITHIN TWO MONTHS OF CARRERA CLASSIC BEING GIVEN THE GREEN LIGHT TO BEGIN WORK

I'm jumping ahead of myself here, but it's important to make the point Carrera Classic's fleet of historic Porsches is very much a 'commercial collection', meaning all cars are for sale. Buying, restoring and selling these vehicles serves to provide the Itävuoris with an ever-revolving cast of air-cooled Porsches, enabling the pair to enjoy seat time in a varied selection of Zuffenhausen metal and taking great comfort in the fact they've been responsible for keeping another classic Porsche on the road with each passing restoration.

And, because each of the cars is personally owned by Jussi and Raili, all projects are completed with no expense spared — this is no traditional restoration business, where budgets are determined by clients and the focus is on profit. The Carrera Classic approach is much more straightforward: do it right, do it properly, don't cut corners.

Above Though the customer had a clear idea what he wanted from a visual standpoint, it was left to Jussi to develop specification amounting to a well-rounded 964 backdate in F-series style











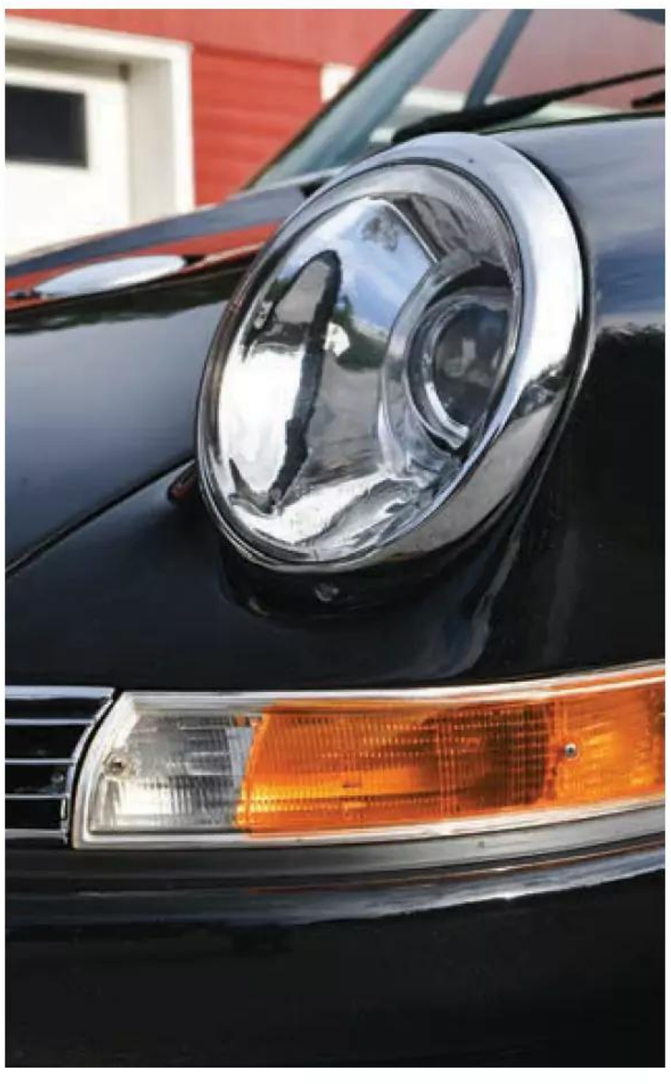
Above Recaro CS Sportster seats occupy a cockpit featuring a wealth of bespoke touches and a retrim courtesy of the team at Lakewell

Below Brightwork looks great against the jet black paintwork, which is the same colour this 964 was covered in at the factory when new

This is, of course, of huge benefit to buyers of the cars Jussi and Raili restore, often from derelict shells. To achieve exceptional standards, they partner with some of the best names in Porsche restoration, regardless of where in the world these concerns might be located. The Itävuori's unwavering demand for the very best results has seen them become well-known in the world of Porsche parts remanufacturing, racing and restoration, even commanding the attention of legendary factory racing driver and former motorsport department chief, Jürgen Barth (chiefly through Jussi's acquisition of an uber-rare 964 Carrera 4 Lightweight). Needless to say, among Finland's pint-sized Porsche community, Carrera Classic is something of a big deal.

By invitation, owners of air-cooled Porsches in this part of the world can enjoy Carrera Classic's workshop services. In fact, while Chris and I were in attendance, the owner of a Guards Red 964 Carrera 2 Targa delivered the semi-open-top 911 for recommissioning and servicing work. Taking things a series of steps further, one of the firm's locally domiciled customers commissioned the build of the 964 Carrera 2 backdate pictured here. Jussi picks up the story. "He said he was interested in owning a backdate and had spent time in touch with a number of different restorers across Europe. He asked if Carrera Classic had experience building this style of 911. I was up-front and admitted I'm a purist, preferring to restore old Porsches to their original specification, but with a decade of experience resurrecting these cars to exceptionally high standards, not to mention solid understanding of the 964 and Porsche motorsport history, there was no reason Carrera Classic couldn't build what he was describing. I should stress, he was very knowledgeable and had done plenty of homework, presenting images of backdates he liked, as well as those he didn't. I explained we'd need to reach a common understanding of what the finished product should be like, which I recommended as aggressive in style and power, but remaining stylish, not too overcooked, the downfall of so many unsuccessfully executed 964 backdates. I also insisted the project be based on a manual 964 Carrera 2."







COLLABORATION STATION

The donor 911 landed in Finland within two months of Carrera Classic being given the green light to begin work on the project. "If you're going to strip and restore a car as uncommon as this, it really makes no sense to start with a low-mileage minter," Jussi reflects. "This car was a daily driver with two hundred thousand kilometres on the clock. A leggy 964 can be bought for a reasonable sum and is the perfect starting point for a backdate."

Much in-person and telephone discussion commenced between Jussi and the commissioning customer, a process amounting to the latter explaining what he wanted from the car and the former proposing the particulars to get there. "Three pages of detailed specification was determined before we got going," Jussi



continues. “This was absolutely necessary. After all, deciding whether you’re going to use fibreglass or steel wheel arches has a huge impact on the development process. I knew this 964 was a ‘keeper’ and would be put to use for many years, hence the decision to run with steel arches, although the bumpers are manufactured from fibreglass.”

Regular use and good maintenance history ensured the donor was free of rust, but this didn’t stop the Carrera Classic team stripping the car bare and ice-blasting its metalwork. The Singer-style steel wings (seventy millimetres wide at the front, eighty at the rear) were modified to incorporate F-series indicator lamp housings, which are welded in place. The bonnet is a lightweight aluminium panel accompanied by an RS bonnet stay and featuring a cut-out for a centrally placed filler feeding an aluminium fuel cell. Clearly, a sporty street car was the order of the day. “Our customer was very much focused on aesthetics,” Jussi confirms. “Despite what you might think when viewing the car’s rear spoiler, he wasn’t asking for a Singer Vehicle Design replica, but he was certainly inspired by the company’s output, which majors on 964s with big wheel arches to permit increased track width. As far as he was concerned, the sportier the look and louder the sound, the better. It was down to me to write the script.”

It was obvious every element of the car’s drivetrain and running gear would need to be upgraded. Carrera Classic has seen many M64-powered Porsches rolling in and out of its workshop doors, not limited to the magazine-featured Maritime Blue 964 Carrera RS Jussi enjoyed for a number of years. Consequently, he already knew who to turn to when it came to sourcing parts for a major engine overhaul. “FVD Brombacher was super-helpful when entertaining my request for components to enable oversizing of the car’s 3.6-litre flat-six to 3.8 litres,” Jussi smiles, before revealing an FVD-supplied parts list including new standard valves, a competition-specification airflow meter, an enlarged throttle body, Schrick 288/280-profile camshafts, Carillo RSR-specification connecting rods, Mahle pistons, Dilavar head studs, a lightweight flywheel and a clutch up to the job of handling further power upgrades in future. The engine’s case was realigned to allow for the increase in displacement, and the FVD team worked with Carrera Classic to recalibrate the car’s Motronic ECU chipset to accommodate the changes. The standard fuel injectors were rebuilt and retained.

THE FVD TEAM WORKED WITH CARRERA CLASSIC TO RECALIBRATE THE CAR’S MOTRONIC ECU CHIPSET

“We could have gone with independent throttle bodies

Above M64 has been oversized to 3.8 litres by way of many FVD-supplied parts









Above Frunk is trimmed to match the cabin

Below Cargraphic exhaust features GT3-style tailpipes and hundred-cell catalysts

and a MoTeC ECU," Jussi shrugs, "but 320bhp is plenty of power for a 964 destined for street use. Besides, when you calculate the financial cost of achieving 350bhp from one of these engines, common sense has to prevail — the price per pony doesn't really justify the expense. Nice to have, not *need* to have. This was the conclusion my customer came to, anyway."

Cargraphic is another company the Itävuoris have high praise for. Based in Landau in der Pfalz in Germany, this aftermarket manufacturer of exhausts for Porsche sports cars (of all ages) produced the backdate's raucous exit pipework, which is a valved system featuring GT3-style outlets and a duo of hundred-cell sports catalysts. "Thomas Schnarr's team were exceptionally helpful," Jussi recalls. "I'm not an engineer by trade, but I've worked alongside and with engineers all my professional life, including in the aerospace industry. The revised mechanical composition of this car was my design, but FVD and Cargraphic were excellent at fine-tuning dictated specification by way of producing and supplying fit-for-purpose parts capable of realising my ambition."



SHOCK AND AWE

The engine is joined by a fully rebuilt G50 transmission (both engine and gearbox are original to the car) bolstered by the appointment of a Quaife ATB limited-slip differential. The suspension, meanwhile, is the tried-and-tested combo of Bilstein B6 dampers, FVD springs, chunky anti-roll bars, Elephant Racing adjustable drop links and a ride height drop of thirty-five millimetres.

"There are many suspension options for the 964. The solution we adopted is fairly conventional, but we weren't building a race car. I didn't want this 911 to deliver a harsh ride. At the end of the day, we were piecing together a road car its owner would put to use as a tourer. He wanted a lower ride height, but ground clearance is perfect at this level, ensuring the ride isn't compromised." Obviously, the wide wheel arches demanded wide wheels. Enter Braid, which manufactured the eighteen-inch deep dish Fuchs-style rims the car now rides on. They were made specifically for this 964 and produced with exacting offset. "There isn't much play in the arches", Jussi admits, telling us he'd have preferred seventeen-inchers, "but they wouldn't allow for the use of the Big Red front brakes we'd settled on." Joined by an upgraded master cylinder, the brightly painted anchors are paired with 993 Carrera calipers at the rear. Discs measure 322mm and 298mm respectively. "You need to understand what you're doing when upgrading a 911's brakes," Jussi advises. "Do your homework. Consider brake pressure, fluids, the appropriate pads, brake bias, disc size and type. This is an essential safety feature of *any* car. It needs to be taken seriously and configured according to the vehicle's overall characteristics, the intended application and expected driving style."



Above Every aspect of the donor 964 Carrera 2 has been redeveloped, with the car's owner now considering more aggressive engine upgrades

The backdate's exterior is refinished in the same jet black (700/A1) it was awarded at the factory, although is now joined by aluminium window frames and horn grilles, titanium hinges, Talbot-style door mirrors and a monochrome frunk badge. LED headlamps, as well as LEDs for the side repeaters and registration plate lights, improve safety for night driving — this part of Finland offers limited street lighting, although Chris and I were acutely aware of the twenty-one hours of sunlight we experienced each day of our stay. A black car isn't exactly hidden in such conditions.

Jussi is rightly proud of this 964, named CC1, signalling the first in a series of 964 backdates to emerge from Carrera Classic. CC2 won't be far behind — a blue manual 964 Carrera 2 has offered itself up for the job. Of all the black beauty's plus points, however, the interior excites its creator most. "The 964 cabin is tight, a result of this platform being designed to make use of four-wheel drive," he explains. "For example, the transmission tunnel is wider than that of earlier 911s, making sizeable aftermarket seats a real squeeze." Even so, his team has managed to fit Recaro CS Sportster buckets. An FVD-supplied Heigo half-cage dictates a rear seat delete, with a fire extinguisher positioned where a small rear passenger might park their bum.

WE WERE ACUTELY AWARE OF THE TWENTY-ONE HOURS OF SUNLIGHT WE EXPERIENCED EACH DAY OF OUR STAY

Black and red is the theme here, as demonstrated by the *haargarn boucle* basketweave carpets and their contrasting stitching. "I liaised with the team at Porsche interior fabric and retrimming specialist, Lakewell," Jussi tells me. "I expressed my dislike for the 964's standard carpets, which are thin and of poor quality. What this car ended up with is heavy-duty carpet originally designed for the 356. It looks great and is exceptionally durable, but due to its thickness, can be difficult to install. Put it this way, bending the material around ninety-degree corners takes a lot of effort."

In addition to supplying the carpets, Lakewell trimmed the car's dashboard, door cards and 350mm MOMO Prototipo steering wheel (what else?!) in black leather with red stitching. "We've worked with Lakewell on fifteen separate Porsche interiors and the work is always exceptional," Jussi beams. Additional interior equipment includes a Rennline pedal set, Carbone aluminium buttons and gauge surrounds, a 917-style ignition key, a Stuttgart Classica gear shifter (complete with wooden knob), red three-point safety belts, a modified centre console, an early 911 interior mirror, custom door entry kickplates, a battery kill switch, a Blaupunkt SQR 46 DAB head unit, an Alpine amplifier and speakers.

When we ask what's next for this brooding backdate, Jussi responds with a smile. "Despite my concerns regarding the cost of chasing more power, the car's owner is considering further engine performance upgrades, which is obviously very exciting. He's used this 911 to cover many thousands of kilometres all over Finland, taken it to various shows and always brings it back here for servicing and maintenance."

Before you ask, unlike the cars in the privately held Carrera Classic collection, this 964 isn't for sale, although Jussi is more than happy to build a similar 911 for anybody who wants one. All you need to do is fly to Finland and meet the man in person. Interested? Take my advice and allow plenty of time for journeying to your chosen airport. ✪

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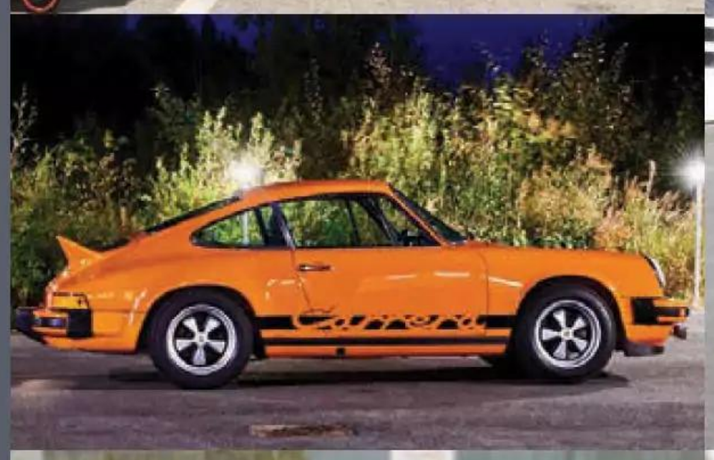
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ENEMY WITHIN

Porsche was never quite sure what to do with the 914. It could have been so much more, as Paul Herbert's epic 914/6 GT evocation proves...

Words **Steve Bennett** Photography **Dan Sherwood**

A story of what could have been? The 1970 24 Hours of Le Mans is etched into Porsche's DNA. Amazingly, this was the first overall victory for the Stuttgart sportscar stalwarts, in which the mighty 917 driven by Richard Attwood and Hans Herrmann headed up a locked-out Porsche podium. As if this wasn't enough, this very running of Le Mans is when Steve McQueen filmed his indulgent *Le Mans* movie, entering his privately owned Solar Productions 908/2 into the race as a camera car. It was driven by Herbert Linge and Jonathan Williams. Amazingly, it finished in the top ten, albeit not classified.

Indeed, in a race of attrition, Porsche won every class in which there was a finisher, all in the shadow of the Salzburg 917's overall win. So often forgotten, but no less of an achievement, is the sixth-place finish scored by the Sonauto-entered 914/6, driven by the French duo of Claude Ballot-Lena and Guy Chasseuil. The race-prepared roadster was entered into the lowly two-litre GT class, but finished ahead of hordes of 911s. This was more than a clue regarding the 914's potential ¬— even with just 220bhp and entered by a Porsche customer, the 914 showed it could humble its far more illustrious half-brother.

We refer to the 911 as the 914's half-brother simply because Porsche was never entirely clear whether the 914 was a Porsche, a Volkswagen, a Volkswagen-Porsche or even a Porsche-Audi, as it was often referred to in the USA. The 914 was, of course, a collaboration with Volkswagen unveiled in 1968. You don't need a history lesson outlining the historical links between Porsche and Volkswagen. Suffice to say, then as now, the two brands are inextricably linked. It therefore seemed logical the two companies should collaborate on a joint venture to build a low-cost Porsche, which could double-up as a high-level Volkswagen. Throw in Volkswagen-Porsche badging and it could be both.

It might have been a recipe for marketing disaster, but the 914 project had a lot going for it. For starters, despite the fact 356 no.1 was mid-engined, and notwithstanding the fact Porsche had much success racing mid-engined sports cars, there was no mid-engined model in the manufacturer's production car line-up (and, after the 914, there wouldn't be another until the Boxster). On the Volkswagen side of things, the only vaguely sporty machine available was the Beetle-based Karmann Ghia. Enough said.

Styling-wise, Porsche wanted something that didn't look like a 911 and Volkswagen needed something that didn't look like a Volkswagen. Outside help was sought, but the usual styling houses were shunned in favour of Gugelot Design in Nue-Ulm, just fifty miles up the road from Stuttgart. Gugelot had already designed a sports car with which it had hoped to stimulate interest among several manufacturers, Porsche and Volkswagen included. And while the prototype was for a front-engined design, it was restyled to accept a mid-mounted motor, as per the Volkswagen-Porsche concept. In a nutshell, this is largely the reason the 914 looks the way it does. Controversial? Most certainly, but sympathetic to those who really love the 914, we would suggest 'leftfield' is a rather more fitting term of reference.

WHAT ELSE WAS THE RELATIVELY NEW WEISSACH RESEARCH AND DEVELOPMENT FACILITY FOR?

Production started in 1970. Engine choices were an 80bhp 1.7-litre Volkswagen flat-four on Bosch D-Jetronic injection, or a pukka two-litre Porsche flat-six with a more wholesome 110bhp and carburettors. The four-cylinder cars were assembled by Karmann in Osnabrück, while the sixes were built alongside the 911 in Stuttgart. In time, the 1.7 would grow to 1.8 and finally to two litres and 100bhp. The 914/6 was quietly dropped after three years or so in production.

TRIED AND TESTED

In order to turn around the 914's fortunes, Porsche decided it might benefit from a bit of *win on Sunday, sell on Monday*. What else was the relatively new Weissach research and development facility for? Porsche's engineers were keen to demonstrate the benefits of the 914's mid-engined layout and its low centre of gravity. Preparations for competition 914/6s began in early autumn 1969. Twelve works GTs would be built by the summer of 1970, these cars forming the basis of the 914's competition life.

The dozen-car line-up comprised three prototypes, two Targa Florio entries, three for the Marathon de la

Facing page No Porsche has benefited form the wide-arch treatment as much as the 914

Route (an eighty-four-hour endurance event held at the Nürburgring, rather than a race over Europe's highest peaks), three Monte Carlo Rally cars and one RAC rally participant. Pretty impressive, given Porsche's top brass weren't entirely sold on the idea, but had been persuaded by the race department. Note the 914/6 was clearly intended as very much an endurance racing machine.

The GT package had substantial reinforcement to the rear of the host 914's chassis, front suspension incorporating stronger front wishbones, plus anti-roll bars front and rear, unlike the road car, which had neither. Ride height was reduced by four inches. Plexiglass replaced side and rear windows, while plastic bumpers took the place of the steel production items. Under the visibly wider engine grille sat a twin-plug flat-six designated 901/25 and based largely on the 210bhp 911 R motor. Downdraught Weber carbs, cylinders with special bores, forged connecting rods, a steel crank and additional counterweighting rounded out specification. With 10.3:1 compression ratio, the 914/6 GT's boxer developed 220bhp.

In addition to the dozen works cars, forty-seven customer 914/6 GTs were built, each offered with the full M471 racing option. These cars were assembled by Bauer at Cannstatt on the east of Stuttgart and were finished off in Zuffenhausen.

Of the works prototypes, two were scrapped, one of which being the Monte Carlo Rally entry driven by none other than Björn Waldegård. Another was sold to Recaro and built into a Nürburgring rescue car, while the third test car now resides in the UK. Indeed, we recently drove it for a forthcoming magazine feature.

The 914/6 GT's competitive career — in Europe, at least — was short but bright, making more than a fair impression. When pitched against the contemporary 911, the 914 was very much the Porsche flagship's equal, if not better. The GT's first outing was in May 1970 at the ADAC Nürburgring 1,000km race, where four 914/6 GTs finished, taking nineteenth, twentieth, twenty-first and twenty-third place overall, plus second in the two-litre class, directly behind a 911 L. Le Mans came a few weeks later.

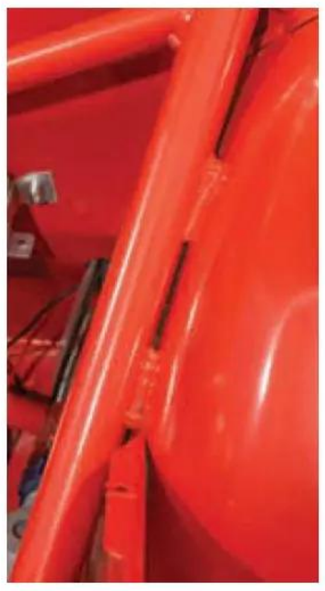
More 911 vanquishing would follow. The three Marathon de la Route 914s locked out the podium, giving

Above and below Amazingly purposeful look is bolstered by a near 320bhp three-litre flat-six making use of many genuine (and rare) Carrera RS 3.0 components

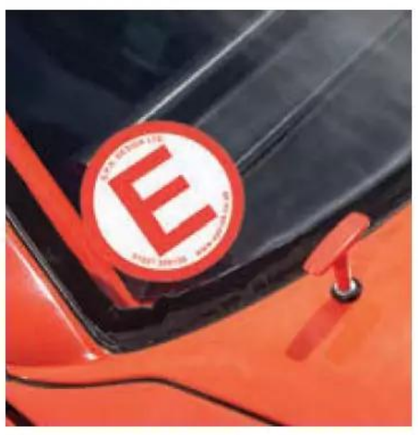
















Below Competition ready, this fantastic Porsche is available for purchase — Paul expects it to head Stateside, where there is ample opportunity to race the car as he intended

the onslaught of 911s a through savaging. By contrast, the 1971 Monte Carlo Rally wasn't quite the giant-killing performance many in Weissach hoped for. Set for dry asphalt, the event was hit by heavy snow. Waldegård's Porsche had to give best to the nimbler (and rear-engined) Alpine. The Swede reckoned he could have gone quicker in a 911. In truth, he probably could have done, but nonetheless, third for the GT's rally debut was pretty good going, especially considering the first 911 home finished in fourteenth position.

And that was pretty much that for the 914/6 GT in competition, certainly as far as Porsche was concerned. You don't need to read between the lines. The GT was too fast. Developing it would have made it faster still. In modern terms, its rather like a Cayman outdoing a brand-new 911. *914/6 GT beats 911 S/T* was not a headline the manufacturer's busy marketing department wanted.

FORTUNATELY, PAUL GOT THE ENGINE TOGETHER EARLY ON, WHICH IS VERY MUCH ON THE PLUS SIDE

The 914's competition career carried on with privateer entrants, most notably in America, where the model was much better understood, particularly on the West Coast, where the Targa panel could be dispensed with near permanently. In the land of Uncle Sam, the 914/6 slotted into International Motor Sports Association (IMSA) and Sports Car Club of America (SCCA) series events and regions. In the myriad classes and categories, cars could be run stock or extensively modified. The 914/6 was perfect for either scenario. Cue a motorsport career continuing to this day. Cue also the inspiration behind this fabulous IMSA-themed GT evocation belonging to Paul Herbert. There is a story to tell, but first up, Paul has history with the 914, so much so he was featured in our sister title, *911 & Porsche World*, way back in 2004, when the Porsche scene was a very, very different place.



HOME TIME

Paul had returned to the UK after working at Bavarian Coach Werkes (BCW) in Ohio, purveyors of wild modified Porsches, with special focus on the early 911 Turbo (930). His 2004 feature car was a lurid yellow 914/6 imported from BCW, which he ran as a road-legal race car, competing in the Porsche Open Championship, which in those days was very 'open' indeed, certainly in terms of permitted vehicle modification. Hence, in Paul's road racer was a 964 Carrera RS engine mounted amidships. There was also a spaceframe front-end, plus a whole bunch of other go-faster bits.



Clearly, Paul is a 914 convert and happily subscribes to our suggestion it's the educated-if-leftfield choice of classic Porsche. "Yes, absolutely," he beams. "Plus, it's faster than a 911 and handles better. If Porsche had stuck with the 914 as a race car and developed it beyond the 914/6 GT, the 911 wouldn't have seen which way it went." Our point exactly. Indeed, had Porsche carried on with 914/6 development, it wouldn't have been too long before Weissach's engineers arrived at something like today's star car, namely Paul's take on what could have been. There's a lot of ground to cover here, but the headline act is a three-litre RS engine, built to produce nearly 320bhp, a full 100bhp up on the aforementioned works racers. And while Rome wasn't built in a day, Paul's latest 914 project has taken some nineteen years, commencing shortly after we sampled his yellow 914. "Life got in the way," he sighs. "I bought the shell in 2005, minus everything bar a few suspension components. It was painted by 2008, but only put through its MOT a month ago." That's some gestation period, but in many respects, the delay has worked in his favour. Then again, in others, it really hasn't. Allow us to explain.

On the minus side, Paul was specifically building his IMSA-inspired homage to race in the then popular Aston Martin Owners Club Intermarque series. Despite being Aston-affiliated (as Intermarque suggests), the competition was a catch-all for different sports car makes. The real draw was how it encouraged 'anything goes' modifications. Cue, then, some incredible racers, from ground effect (seriously) DB7s with design input from Adrian Newey, to Richard Chamberlain's famous orange 935-inspired racer, which has featured in our pages over the years.

The minus? Sadly, the Intermarque series ceased to be some years ago, leaving Paul without preferred playground or any other suitable series. Historic motorsport? "No chance," he says. "Historic racing is a closed shop, unless a car is completely original and carrying FIA papers, even if back in the day, Porsche was messing about, mixing and matching parts."

A RECENT TRACK DAY SAW PAUL WORKING ON THE DAMPING TO ACHIEVE A SETUP FOR BOTH FAST AND SLOW CORNERS

This setback took the wind out of the project for some time, but fortunately, Paul got the engine together early on, which is very much on the plus side. "No way I could commission the build of that flat-six now," he sighs. "It would probably cost north of sixty grand. Porsche prices have gone stupid in recent years." We should stress, his current 914's engine isn't just Carrera RS 3.0 in specification, it's Carrera RS 3.0 in original parts, hence its value. "It's been built by Steve Winter at JAZ in St Albans. He really knows how to put together a powerful air-cooled engine. This project wouldn't have been possible without him."

Paul and Steve scoured most of Europe — if not the world — for correct parts, including alloy casings from Switzerland, fully balanced RS internals, pistons, crank, connecting rods and big-valve flowed cylinder heads.

Above Paul has lavished a huge amount of time, money and attention to detail on this amazing build, which drives every bit as well as it looks











Below Chassis stiffening features throughout, aiding the mid-engined layout in delivering a mind-bogglingly compliant ride, although the cabin is somewhat cramped

A period-correct Bosch mechanical fuel injection unit pumps petrol via carefully machined injection towers, which taper to match the inlet manifolds. Fine-tuned on Neil Bainbridge's dyno, the engine produces a crisp and responsive 318bhp, which is a very impressive figure for a normally aspirated three-litre flat-six and testament to advances in modern engine build techniques.

"Usually, for this sort of power, you'd have to go to 3.4 litres," Paul reasons, "but then you'd lose the revvy nature of the three-litre boxer." Putting the power down is an oil-cooled Type 915 transmission with a shorter top gear, a Wevo 906-style shifter and a short-shift aluminium tower. As Paul confirms, this setup eliminates the 915's traditional vagueness. Granted, when it comes to a build menu, sorting the engine and gearbox first is, perhaps, a little arse about face, but as we want to make clear, the skewed timeline brought financial benefits. Having a body shell prepped and ready to bolt all the componentry to was equally vital.



The 914/6 GT look absolutely rocks. Indeed, if ever a Porsche has benefited from the pumped, wide-arch treatment and fat wheels-and-tyres, it's the 914, taking the basic design from slightly oddball to full-on desirable. Externally, then, this IMSA homage has been fitted with factory-style GT panels, flared steel arches, and a lightweight fibreglass boot and bonnet, with correct balsa wood strengthening to keep the panels rigid. The front and rear aprons are also fibreglass. The finish is obviously arresting, and while Paul hasn't modelled the colour or livery on any particular period IMSA racer, they reflect the appearance of the Porsche-Audi US dealer race cars, driven by Peter Gregg and Hurley Haywood.

Paul did the majority of the work on the shell himself, but had Custom Cages fit a full FIA-approved roll cage, which is tied into the suspension pick-up points. "The shell is incredibly stiff and strong. You can jack up one corner and the other three wheels lift. By comparison, a standard 914 is very wobbly." Stiff is exactly what's required for the suspension to really work properly. Talking of which, Paul has opted for Pro-line Protrac racing shock absorbers, adjustable for bump, rebound and ride height. Being a road racer, there's no need for rubber bits in the suspension, hence the appointment of Elephant Racing Polybronze bushings, ensuring maximum compliance.

The car was corner-weighted and aligned at JAZ, with weight distribution being split 49/51 front/rear. If ever an illustration was needed as to the benefits of a mid-engined layout, this is surely as good as any?

Despite Paul's previous 914 racer running on 930 brakes, the car on these pages stops just fine on 911 SC calipers loaded with vented discs and joined by an uprated AP Racing master cylinder and balance bar. The car grips pretty well, too, on its genuine staggered Minilite wheels wrapped in semi-slick Nankang tyres.

The interior is stripped for action, the cabin occupied by FIA-approved Sabelt seats and harnesses, RS-style door cards and a quick-release MOMO Prototipo steering

wheel, plus sliding Perspex side windows and a heated windscreen. The colour-coded instruments we recognise from Paul's previous 914 racer, complete with the No Fear logo on the rev-counter, which rather takes us back.

That's an overview of the nineteen-year build. A recent track day at Castle Combe saw Paul working on the damping to achieve a setup suitable for both fast and slow corners on the mainly-very-fast Wiltshire track. "I managed to get down to one minute and twenty seconds, with another couple of seconds to come." That's pretty fast, putting Paul's 914/6 firmly into Combe's top twenty-five lap times and on the pace of a Cayman GT4. He also rates his 914 on the road, its suspension proving to be surprisingly compliant.

What does the future hold? Well, it's good news and bad news. We'll start with the bad, which is to say bad for Paul. He's decided that without a race series to compete in, he's going to sell the car. "It's a pragmatic decision," he says. "I intended to build a 914 I could drive to the track, race and drive home. The Intermarque series is gone, and folk just don't want to race like that anymore. It's all big transporters, massive motorhomes and hotels. The old camaraderie of 'pitch a tent and have a BBQ in the paddock with your fellow racers' is all but gone. Also, I really can't afford to bend this car or for the engine to go bang, which is a sign of current times and where the classic Porsche market is right now." A great shame indeed, but Paul's other passion is Triumphs — he owns a 1965 Spitfire converted for rallying. "The parts are literally pence," he laughs.

The good news? His 914 is for sale, meaning someone gets to enjoy the fruits of Paul's labour. "The 914 is far more appreciated in the US than in the UK and mainland Europe, which is why I suspect the car will cross the Atlantic. The US racing scene is stronger, too, and then there's Stateside appeal for the IMSA look," Paul muses. The IMSA look? The whole look, we'd say. This is one tough-looking racing machine. Short and squat with all the right details, topped off by quad SEV Marchal endurance racing lamps.

Porsche got the 914/6 GT absolutely right. Too right, in fact. Oh, what might have been. ✪



Below Genuine Minilites are the perfect wheel for this 914

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BLACK BEAUTY

The restoration of Max Richardson's 356 Outlaw arrows straight back to the origins of model specialist, PR Services. Proprietor, Paul Smith, gives us the lowdown...

Words **Johnny Tipler** Photography **Dan Sherwood**

These days, it's considered almost a criminal act to abandon a classic Porsche, but restoration can be financially daunting, whatever the model, and in the case of resuscitating a 356, the work is hugely complicated. Luckily, we're in good hands — model expert, Paul Smith, is owner of 356 specialist, PR Services. The 356 B he's showing us around belongs to Max Richardson, whose father, Adam, was Paul's first customer. There's a nice backstory to explore. Bear with me, because it sets the scene for the black restomod.

"More than three decades ago, renowned engine builder, Barry Curtis, prepared a 356 race car for Adam to compete with," Paul remembers. "In fact, he raced a couple of 356s very successfully, winning the European 356 Cup three years in a row. Myself and a couple of mates were drafted in as pit crew."

Adam was the only English entrant among a field of German, Dutch, French and Italian speed merchants. The series was held on some of the big-time European circuits, including Spa-Francorchamps, Paul Ricard and the Nürburgring. Fed up with racing in England, both Adam and Barry were only too happy to compete overseas. "At a race meet in the UK, Adam was asked to slow his 356 because Lotus drivers were getting upset," laughs Paul. "That's a true story!"

Having lived in Australia for a couple of years, Paul returned to his native Essex, after which he met Adam in a pub. "He was complaining about the fact he couldn't find anybody to build his 356 to a standard he was happy with. I suggested I'd do it for him. This really was the start of PR Services. I ended up building two cars for him. Word spread and somebody else got in touch with a request for me to work on their 356. Suddenly, I was running a business."

And so, we find ourselves sampling the black 356 you see here. Originally painted Slate Grey, equipped with a red interior, running on Dunlop B7 tyres and delivered to Northbrook Porsche Imports of Illinois in 1962, the car arrived in the UK in December 2015. It had spent time in France and was in a very poor state.

The then owner offered the four-cylinder Porsche for sale via Facebook. "The required repairs are beyond my skillset," he declared. Paul, of course, was more than capable of restoring the car. "Loads of people wanted to buy it at virtually zero cost. I dropped the seller a message and told him I would be able to find the car a new owner. A short while later, Adam and Max were in my workshop. They were keen to embark on a new project and asked if I could build them a bespoke 356. The Porsche advertised on Facebook was the ideal starting point." It was, however, in "horrendous" condition, not least as a consequence of being smashed twice in the front. "One of the worst 356s I've worked on," Paul confirms. "I knew the car's poor condition meant it would only lend itself to some sort of mad build or race car. Furthermore, not only had it been crashed, but it was also very rusty and non-matching numbers. It's a 356 B T6, so not really the most desirable classic Porsche. It was pointing itself towards an Outlaw build or a competition car."

PAUL RECKONS TO GET A PERFECT JOB, A 356 RESTORATION NEEDS TO BE UNDERTAKEN BY SOMEONE ON "AT LEAST THEIR TWENTIETH"

The idea was for the project to serve as a way of Adam and Max enjoying a bit of father-and-son time together, but building and restoring a 356 is a journey in itself of at least two years. "911s are three times as easy to restore," says Paul. "Don't get me wrong, working on 356s is great fun, but these cars are time-suckers."

Adam and Max's firm intention was to have the finished build painted black. After considering various spray shops, the job was given to Spike's Vintage Restorations in Tolleshunt Major. Having owned two or three black cars down the years, I was interested to know what makes this colour so difficult to paint. "If you think of a 356, what you've actually got is a teardrop shape," Paul explains. "There are no swage lines to help lose imperfections. You've got three-millimetre gaps on every door, and each has to be perfect. Ultimately, when painting a car black, 356 or otherwise, you're effectively making the entire body a mirror."

Making a mirror out of a teardrop? It's hours on a time sheet. More fundamentally, Paul asserts, "the main trap people fall into with the 356 is thinking it's an ordinary car. It's only when they start to work on one that they realise it very much is not. Max's 356 is a case in point. Essentially, it landed here because two or three guys had

Facing page Lack of frunk grab handle dramatically changes the look of a 356 and demonstrates just how much Erwin Komenda's design evolved into Butzi Porsche's original 911 concept

come unstuck trying to repair it. The fabrication of the 356 is an extremely complex construction. It's an inner monocoque with skins welded over the top. To repair the structure or deal with any corrosion to the main core of the vehicle, you've got to remove the outer skin. In effect, it's like restoring two cars. Unlike, say, a 911's front wings, you can't unbolt any 356 body parts, save for the bonnet, engine lid and doors. If you want to remove the wings, you've got to cut them off." And then of course you've got to put them back on, paying special attention to the teardrop shape and ensuring perfect panel gaps.

Paul reckons to get a perfect job, a 356 restoration needs to be undertaken by someone on "at least their twentieth", thereby ensuring they know what they're doing. "This is the main problem with 356s. It's the hours they consume when dealing with bodywork. Max's black car took close to 1,300 hours, just on the metal. That's before paint. Then there's prepping and spraying and all the rest of it."

Ahead of the paint job, the shell received the kind attentions of north-Kent based Soda Blaster to remove existing pigment. Paul recommends Southend-based bodywork specialist and former hot-rod exponent, Andy Barry, for body repairs. Mark Eve at Top Coat applied the body to his Celette jig-bench-frame to ensure the shell was straight. Component shot-blasting was carried out by Del's Joinery.

Paul also endorses Sportwagen in North Shoebury and Lionel's Body Shop (aka Richard Clark at LBS Restoration) in Southend as trusted agents for classic Porsche body repairs and paintwork. I wonder whether he is blessed to have so many trusted sub-contractors located close to his Billericay base. "It is a very complicated business structure," he admits, "because you're looking for a company who can do the job precisely when you need it doing. A firm like Sportwagen will have an eighteen-month waiting list. In other words, if you want your car restored and you're asking PR Services to take care of the job, rest assured we are able control the project and solve any problems along the way." I refer him to Spike's Vintage Restorations, mentioned earlier. This is another pseudonym, it turns out. Spike is, in fact, the nickname of a chap named Andy Finch. I'm reminded of a nightclub held in a mansion at the same postcode as his base of

Above Removal of the hubcaps and chrome frunk handle has a dramatic effect on the appearance of a 356



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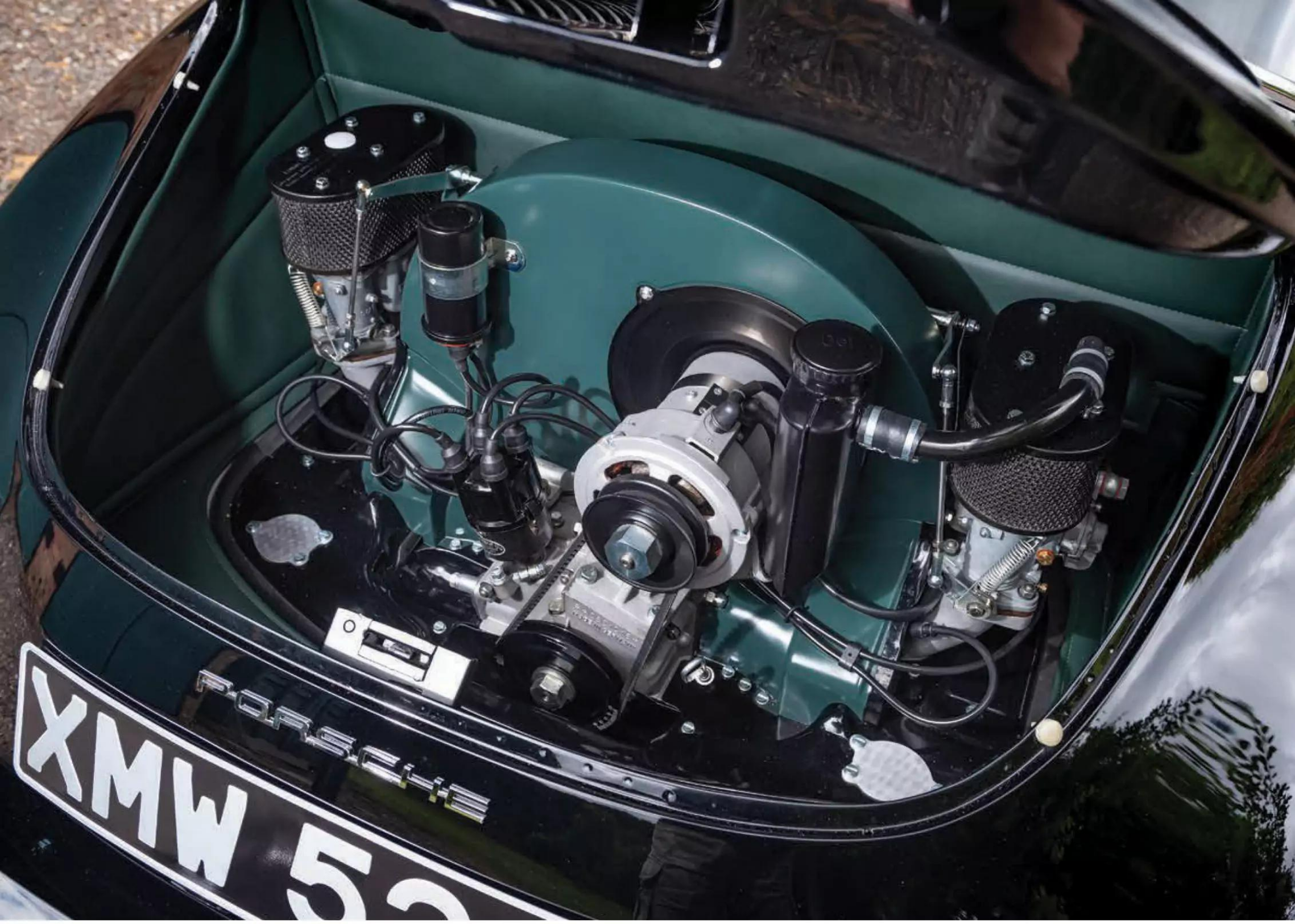
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operations. In a previous life, I regularly attended the venue's discos and confess to Paul I spent much of my formative years in the region. "We Essex boys stick together," he laughs. "I've known Spike since the 1980s, when we were painting Volkswagens. He worked for Jaguar specialist, JD Classics, before starting his own business. He does very good work, as demonstrated by the finish on Max's black 356."

Perhaps *Canvey Noir* wouldn't be an inappropriate label, given the subject's geography?

Despite the list of talented specialists we've namechecked, to suggest the car returned to PR Services for the drivetrain and suspension to be reinstalled is, well, too simplistic. Paul describes the convoluted saga. "Here's how it works. You bring us a 356 to restore. We then sympathetically take it apart. Of course, we want to re-use as many original components as possible. When dismantling is complete, 'dry fitting' of new parts occurs to ensure door frames and closure panels are going to sit as intended. When satisfied, we send the car away for bodywork repairs and paint. It returns to us as a painted shell. In the meantime, we will have rebuilt the engine, gearbox, brakes and suspension. Restoration of brightwork also takes place while the car is away. This means we can begin to reassemble the vehicle as soon as it is back in the our workshop."

The lack of superfluous ornamentation — most noticeably the absence of the chrome strip down the front lid and no hubcaps — gives Max's 356 a certain pared-back, bare-bones look. Streamlined, even, which veers into so-called Outlaw territory. The competition wing mirrors enhance the impression, although the retention of chrome bumpers front and back lends a paradox — a racing 356 would have them off for lightness, but in the real world, the 356 shell needs the protection they offer.

SMART LEATHER DOOR LINERS WITH WINDOW WINDERS, HANDLES, DOOR PULLS AND POCKETS, ALL BEAUTIFULLY EXECUTED

The shiny black Karmann bodywork contrasts with the bright, five-stud polished steel Group 4 wheels, which help assert the car's vintage, along with the beehive-cone front sidelights and rear lozenges. Period-style number plates, discrete Porsche badging and a single chrome tailpipe peeking out from the CSP exhaust are classy (if understated) details. Abarth-Carrera-style louvres flank the polished lattice air intakes on the engine lid, where we note the presence of a small PR Services badge.

The cabin upholstery and retrim was carried out by Neil Tadman at Neil's Auto Interiors, situated in

Above Engine has been oversized to 1.7 litres, making it more peppy for darting around London, where the car resides following completion of the restoration work





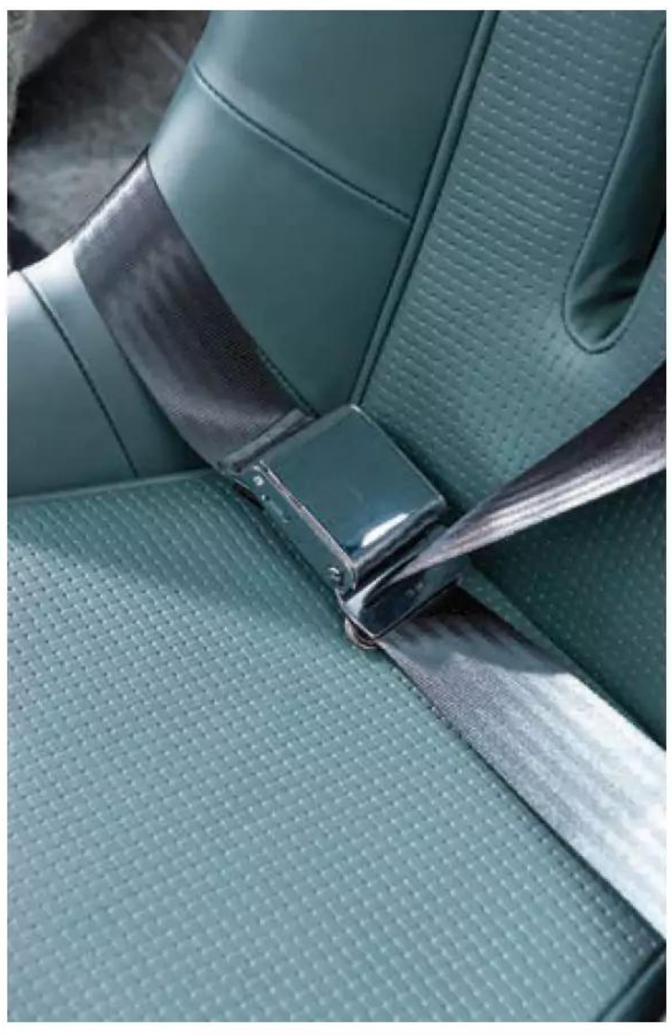
Above and below Teal leather might sound like an odd choice, but the results speak for themselves — against the black paintwork, the car's interior is nothing short of stunning and features many expertly executed details

Hawkwell, Hockley, another of Southend's outer suburbs. Neil is another old friend of Paul's. "He's a hot rod guy, but he must have trimmed between forty and fifty 356s for me over the years. When PR Services projects started rolling through his workshop doors, we began doing things a bit differently, such as using basketweave on Simonsen aluminium Speedster seats and making up non-standard pockets and headlinings. The interior of Max's car was great fun."

I notice smart leather door liners with window winders, handles, door pulls and the commodious pockets to which he refers, all beautifully executed. Front and rear quarter-light windows operate perfectly, too. The dashboard gauges are smart and comprehensive, with central clock and fronted by a charming Nardi Torino wood-rim steering wheel. The carpeting is standard practical-basic, while the bucket seat covers are generously upholstered in woven-look Teal blue leather and wreathed in period-look belts.







Open the fuel filler cap, and the splashguard matches the interior upholstery — a neat touch. Similarly, the front luggage area and spare wheel cover rejoice in the same subtle leather cladding. Even the tool roll, complete with brand-new contents, gets the same treatment. This really is a very classy job. The rear of the cabin is equally tastefully done, with fold-down seats and a semi-circular arc of green-blue leather cladding the rear bulkhead. You just want to snuggle down and spend the night in here.

ELECTRIC DREAMS

This classic Porsche was rebuilt to work in the modern world, hence the appointment of twelve-volt electrics and USB chargers where the gear lock should be. The rebuilt radio came from Chrome in London and can be connected to a smartphone via Bluetooth. The speakers are discreetly inset into the sides of the cabin footwells. Oh, and peer into those headlamp lenses and check out the LED bulbs. There's comfort in knowing you can make night moves and see what you're up to.

Lift the rear lid and what you're presented with is so immaculate it qualifies for the 'eat your dinner off it' epithet, except that to do so would be to defile a pristine engine bay. In the course of the engine rebuild, PR Services endowed the flat-four with increased capacity. "When the car first arrived, it was fitted with a 1959 1,582cc Super 90 engine developing ninety horses. We fitted a stage one camshaft, diamond-like-coat followers and oversized barrels and pistons, pushing displacement to 1,720cc. All the little tricks you learn when you've been racing for many years." Indeed, PR Service's racing legacy means lessons learned on track can be implemented on road cars.

Or maybe not, as Paul explains. "The whole thing about a 356 is that you don't have to do anything to it. You can get in the car, drive it to a track, race it, and then drive home. People bring their 356s to me and ask what updates they need to apply in order to go racing. Take the hubcaps off — anything else is down to you as a driver. I can certainly point customers in the right

direction when it comes to personalising their Porsche, but there's not much you have to do to these cars. You can spend lots of money just to take half a second off a lap." That said, the black beauty features a 356 C disc-brake conversion, Koni dampers and an eighteen-millimetre front anti-roll bar, plus 50 Shore rubber bushes and rebuilt Solex P11/40 carburettors.

Where does this black teardrop live? North London. Hampstead, to be precise. Personally, I'd be wary of driving an air-cooled Porsche as clean as this in the capital. Paul can't help but agree. "When Max took the car home, I couldn't help but think that was the last time it would look shiny and new. I should stress, it's important not to paint the fun out of a car. Don't be worried about it. It can always be touched up or resprayed, after all. You can repair scratches. If you're a racer, you know full well what might become of your car in the heat of battle on a track, but you also know how to repair cosmetic damage. Don't be too precious about it."

What does the future hold for this gorgeous 356? "Obviously, Max watched his father play with classic Porsches for many years and, now Max has come of age, he wants to join in. Not necessarily doing exactly the same thing, but he wants to be involved with old cars. This 356 is his foot into the world of air-cooled Porsches. He tells me he's never driven a car causing so much of a stir and commanding so much attention. It turns heads everywhere." It's a powerful drug, a head-turning car, but here's the key: Max is not diffident about using his black 356. All too often people have their cars restored and, thereafter, they don't want to use them. Paul's expression is great: don't paint the fun out of your car. No blackout. In this case, Max has done the opposite — he's had the fun painted *in* to his car. ✪

Above CSP sports exhaust is a high-quality system available to order direct from Paul and the team at PRS



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STYLE COUNCIL

When a top international designer's personal penchant is for a modified 993, it affirms the choice of all Porsche owners. We visit Ian Callum CBE for a lesson in the love of cars…

Words **Johnny Tipler** Photography **Dan Sherwood**

Gloating is never a good trait, but when you discover one of the world's greatest car stylists uses a classic Porsche as his daily driver, a feeling of warm smugness is forgiveable, especially considering the man in question is noted for some of the best offerings from Jaguar and Aston Martin in modern times. I'm visiting Ian Callum at his eponymous Warwick-based design studio. Centre-stage in the workshops of the firm's headquarters is a pair of reimagined Aston Martin Vanquishes, among the most recent models to flow from Ian's drawing board.

ROOCK MIGHT NOT BE AS WIDELY KNOWN AS OTHER PORSCHE TUNERS, BUT IT WAS HUGELY SUCCESSFUL IN MOTORSPORT

He hails from Dumfries. Fifty-five years ago, at the age of thirteen (you do the maths), he submitted a rendering for a car design to Ford. He started work for the company in 1979. Eleven years later, he joined design consultant, Peter Stevens, at Tom Walkinshaw's TWR Design, with standout projects including development of the Aston Martin DB7 and Nissan R390 GT1. From 1999, Ian was design director at Jaguar and Aston Martin, responsible for the DB9 and V8 Vantage, the F-type and XE (among others), and earning the CBE in 2019.

In his gentle Scottish brogue, he tells me about his car life, his influences and some of his favourite projects. His personal stable, so I discover, stretches to twelve vehicles, although he is notably vague when it comes to their whereabouts. "When I start listing them, I forget which ones I've got, because they're all over the place," he laughs. "Three of them are actually in dry dock getting worked on, which is convenient because I've got nowhere else to put them. I've got a place down in Dorset where I keep two cars. That's where my Beetle Cabriolet is destined to go, as well as my Alfa Giulia Sprint GTV restoration, which is about to be finished."

The Beetle 1303 he refers to is presently being delivered to a lock-up elsewhere in Warwick. I give him a lift in my 987 Boxster S. Chatting en route, I learn more about the Callum collection. "As well as the 993, I own a 914, which is currently being built by Tuthill. I gave the company a box of parts which I'd bought and had the body re-done in French blue. And I've got this Beetle Cabriolet, which is my third air-cooled Volkswagen. I just love the simplicity of them. Additionally, I own a couple of American hot-rods, including a 1967 Chevy pick-up truck. I've got the Alfa, a TR6, a 1976 Jaguar XJ coupé, plus a classic Mini. I've also got a Volkswagen van and a BMW 6 Series." What about cars he's personally designed? "Oh, yes," he roars. "I've got a Vanquish. I forgot about that! It's just a standard Vanquish S, but I'm looking to sell because it's the car I drive least, though it is the only car in my collection which I've designed."

I find this admission surprising, but Ian is quick with explanation. "When you live with a design for so long, in this case from its very inception, you have a love for it, but a bit like teenage children, once they're grown up, there's every chance you want them to go away and leave you alone." All said in jest, of course, though if I'd produced something as beautiful as the Vanquish, I'd have it living in my kitchen.

Actually, Ian has done something similar with his 993 — his Dorset home features an indoor floor-to-ceiling glass window with a view through to his garage, ensuring the Porsche is visible from his sitting room.

JAM SESSION

Like many red-blooded petrolheads, Ian has participated in his fair share of trackdays, though he's not had a go at racing. "I was a bit of a hoodlum in my younger days," he tells me. "I enjoyed being invited to attend track events with dealerships, but I've never actually raced. It's one of my biggest regrets — I would have liked to have learned how to race a car properly." Clearly, then, speed and performance are always at the back of his mind, despite the need as a Jaguar corporate stylist to come up with saloons and SUVs for the masses. "In my twenty years with Jaguar, I got to drive many quick vehicles, including my own F-type company cars. Currently, I'm in possession of a 500bhp SVR F-type. You get used to that magnitude of horsepower. When it comes to old cars, you realise they may have been quite potent in their time, but dashing to 60mph from rest in nine seconds is nothing to shout about today. Nevertheless, I love driving my 993, not only because I always wanted a 911, but also because I love air-cooled engines. Much like the Beetles I've owned, with a classic Porsche, you have the engagement of simply driving and steering the thing. There's mechanical empathy, as well as the joy brought on by simply looking at the car."

Now we're getting into the design aesthetic. "The classic 911 Turbo was always my poster car," Ian

Facing page He might have a selection of wonderful sports cars at his disposal, but this Roock-built 993 is Ian's go-to



Above Pictured in the laboratory-like environs of Callum's advanced facility in rural Warwickshire

reveals. "That said, from the moment it was launched, I've always regarded the 993 as representing the 911's finest form. Some designers have offered criticism, complaining the line of the car stretches from the front to the rear without going back in again. I remember Peter Stephens suggesting the 993 doesn't have the purity of the wheel arch coming back into the form of the bumper, front and rear, like earlier 911s did. But when you look how much room there is to achieve this, I can understand why the design was executed the way it was. It also elongates the sense of the rear wing. For me, aesthetically, the 993 is the prettiest 911. And, of course, this was the last air-cooled 911, before water-cooling and the rapid increase in the model's overall size. It got quite big after this." It sure did.

ONCE WE'VE COMPLETED A FEW CIRCUITS, IAN GOES BACK TO HIS DRAWING BOARD AND HANDS ME THE KEYS TO HIS 993

What does Callum — the company — do? Full disclosure would find me dead in a ditch, but Ian can reveal *some* of what his team works on. "It's three-fold," he remarks. "We carry out work for outside clients, undertakings which can remain confidential, whether it be for volume-production or individual cars. We also collaborate with other brands, not necessarily those involved in the automotive world. That said, we're developing a car with Hungary-based super-luxury EV outfit, Kincsem, which will result in a hybrid hyper-GT based on the Jaguar C-X75. We're taking care of the body and other design work." Callum also collaborated with Prodrive in the design of a contender for the Dakar rally. Specifically, the brief was to "design a vehicle which can go through hell in the desert and look good while doing it." Ian teases by saying Callum has a several similarly structured projects on the go right now, but can't yet bring the detail to light.

Talking of teasing, I get a glimpse of several classic 911 shells in the back regions. "Naturally, we work on our own projects, which we fund ourselves. Again, we'll be a bit more public about this work later. It's important to note, Callum is still a young company, established











Above Despite carrying a stack of creature comforts and a sunroof, the car weighs only two kilograms more than a 993 Carrera RS

Below Man and machine in perfect harmony. Sort of.

2019. In the not-too-distant future, it will be fairly obvious which companies and brands we're working with. It's all very exciting, because in a small business like ours, you don't always know what's coming from one month to the next. Moreover, I can't really stop as a designer, and creating cars is a very expensive medium."

We bring his 993 inside the workshop studio and park it alongside a pair of Astons for the static shots you see on these pages. There's more here than meets the eye. "It's about the finished product," says Ian. "These two Vanquish VC25s are examples of Callum company projects. Essentially, we've taken the Vanquish, which I styled twenty-five years ago, and we revamped it, giving the car a new lease of life. Whether we build our target of twenty-five VC25s remains to be seen, but satisfaction lies in the fact I'm able to take a car I designed all those years ago and reimagine it into something even more valid for today. The work isn't just about style, though. We've got a full engineering team here —we've redone the chassis, drivetrain, and even offer the car with a manual gearbox. It's a real update. Small things, such as the mirrors, are unique, the wheels are new, the suspension is new, moulded bodywork is new and the interior is completely new. It's a big job."

BEAT SURRENDER

What made him decide to pursue a career as a car stylist in the first place? "The extraordinary look of early Porsches had me determined to design cars. I was at home in Dumfries and a silver 356 flew past. It was likely brand-new. I immediately asked my grandfather what we were looking at and he told me it was a Porsche. Don't tell the Aston guys, but my two loves in life are Porsche and Jaguar. These cars are beautiful, but also tenable, by which I mean they're relatively affordable. I love Astons, but they were far too exotic and expensive to be something you would see regularly."

Now then, let's get down to the nitty gritty: the current vehicular love of his life, his modified 993. Ian owns just the one 911, and he waited a long time for it. "I spent eighteen months looking for right car. Unfortunately, this period of time coincided with the moment the cost of classic Porsche ownership went through the roof. I thought I might have to settle for a less expensive Targa or a Tiptronic-equipped model, but I held out and, eventually, this amazingly redeveloped 993 came up for sale at Saltash-based independent Porsche sales and restoration specialist, Williams Crawford." What attracted him to the car? Well, how about the 305bhp 3.8-litre flat-six, pulling 286lb-ft torque? Consider the fact a 993 Carrera RS delivers 'only' 300bhp and uploads 262lb-ft torque. Weights are comparable, too: 1,279kg for the RS and 1,281kg for Ian's kiddie. How is this managed? Weight saving includes deleted soundproofing, Porsche-monogrammed Recaro Pole Position buckets, a rear seat delete, aluminium front lid, lightweight wheels, RS door cards and wind-up windows. And while a pukka 993 RS would cost you north of







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Above Bespoke 3.8-litre flat-six packs 305bhp

Below Mister Tipler gets behind the wheel of Ian's Roock-built 993 and discovers a 914 build is in the works

£250,000, Ian's car was pitched by Williams Crawford with a price tag hovering around £90,000. Unsurprisingly, it didn't take long for a deal to be done.

His 993's oversized powerplant was built by Roock Racing. The pedigree is first-class. Put it this way, Roock Racing might not be as widely known as other German Porsche tuning companies, but the Leverkusen outfit — founded by brothers, Fabian and Michael Roock — was hugely successful in sports car and endurance racing in the 1990s. The team won the 1993 Carrera Cup, the 1994 Porsche Supercup, the ADAC GT Cup two years on the bounce (1994 and 1995), the GT2 class at the 1996 24 Hours of Le Mans and scored many other victories, making it the most successful Porsche customer team of the decade, an achievement helped by Roock's development of a near 600bhp 3.8-litre 993 GT2, entered into Le Mans in 1998 and standing as the lightest 993 GT2 ever assembled, tipping scales at a mere 1,060kg.



MOD FATHERS

With all this in mind, it should come as no surprise to learn Ian's 993 was configured by Roock for trackday work. "It has been configured very well by Roock's people. It's certainly not dialled in to the point the car is undriveable on the road. It's still got quite a bit of compliance in it, and I enjoy the fact it retains creature comforts, such as a radio and sunroof," he says. The sunroof alone probably counts for the two kilos Ian's Roock ride carries over the weight of an RS. "This 993 is more than quick enough off the line, and for a 911 of its age, it's also very fast," he adds, before telling me he's in the market for a 928. "I remember when the model was first launched, back in the late 1970s. It's a remarkable piece of design, quite like a spaceship. When I see one today, I'm always struck by the angles around the windows and the back end. They're superb. I prefer the early shape, the 928 without spoiler, but I understand why aerodynamic efficiency demanded the update. I wouldn't be surprised if the 928 is the next big thing on the classic Porsche scene. More people are discovering just how wonderful these cars are."

We venture out onto what pass for backroads in densely packed Warwickshire, ending up at Stoneleigh expo grounds. I'm driving the camera car, complete with our photographer harnessed in the back. Once we've completed a few circuits, Ian goes back to his drawing board and hands me the keys to his 993. After a little fiddle with the immobiliser, the car fairly barks into life. The leather-trimmed and perforated Recaro seat is perfectly contoured. I juggle it a bit as I'm slightly too far away from the pedals. Being a right-hooker, they're offset into the centre of the footwell — it's vital to remember



where they are when I need to brake. But wait! The wow factor comes thick and fast. Straightaway, the steering feels finely weighted and beautifully accurate, responding to the slightest input. The gearshift is smoothly compliant, and so much nicer than that of my Boxster. The throttle is sharp, and the brakes are really firm but progressive, not like my Porsche's ceramics, which are sudden stop-on-a-sixpence.

I'm sitting relatively high because Ian's padded-up the seat bases. In a regular 993, you wouldn't be perched up like this. I luck into a series of fast sweeping bends and get my foot down. This 911's Roock powerplant loves to rev, emitting a gorgeous, inimitable flat-six cacophony from 4,000rpm, yet the engine is also impressively torquey, pulling strongly at 1,500rpm. It's a firm old ride, and it certainly hangs on in there through the turns, but braking is phenomenal. A few miles of this and I have an understanding of the car's vast resource of capabilities. Then again, whoa! Here come the roundabouts. This Roock-built 993 turns in supremely accurately, demonstrating its taut chassis with perfectly balanced handling. It certainly sticks to the chosen line through corners as I lean on the P-Zeros, while throttle response and torque deployment mean I'm almost instantly heading down the road again. There's an aggressive, perhaps even raw edge here. This is Rennsport territory and no mistake.

THIS 993 TURNS IN SUPREMELY ACCURATELY, DEMONSTRATING ITS TAUT CHASSIS WITH PERFECTLY BALANCED HANDLING

Back at Callum, I return the car's keys. My proposal of marriage to Ian's 993 isn't rejected out of hand. I suspect if he did ever sell this Porsche, he could only be seduced by something very similar — I suspect another 993, ideally in Guards Red — though it would have to be endowed with specification of the Roock variety. Nothing standard will do for the maestro. ✪

Above The base model was a 993 Carrera, which was utterly transformed by the team at Roock Racing at the instruction of former owner, Steve Bennett, head of aftermarket tuning company, 64 Tailored Performance

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Vintage Garage

RESTOMOD RISE

Peak restomod? If we've reached this point in the Porsche pantheon, then this wonderful Lakewell-trimmed Carrera 3.2 Targa engineered by Vintage Garage could be it. As an example of automotive art, it's the perfect vehicle for a restomod retrospective...

Words **Steve Bennett** Photography **Ade Brannan**

Porsche restomods, retromods, backdates, evocations. Call them what you will, they're very much a thing, as this bookazine demonstrates. For the purposes of this publication, we've settled on one primary term of reference: restomod. And the purpose of this article? To examine the restomod scene and chart its twenty-plus-year progression from cheap-as-chips, fibreglass-panelled RS lookalikes to near million-quid, hand-built creations launched at glitzy concours events. To help us on our way, we've got a lovely restomod from the team at Porsche interior trimming outfit, Lakewell, and master engineering firm, Vintage Garage.

Put simply, this particular 911 is a prime example of where we're at and what's what in this now mature world of Porsche personalisation.

Of course, it isn't just 911s getting the restomod treatment, but you could be forgiven for thinking so. Why does the 911 lend itself so well? Think cult appeal, motorsport heritage, Porsche's own mix-and-match parts bin, not to mention a healthy aftermarket bursting at the seams with tuning and styling parts. There's also a ready supply of donor cars, a result of the 911's six-decade production run.

It's also about eras and trends. It was never called as such, but back in the 1970s and 1980s, you could easily have said there was a 'futuremod' scene. A what? Many was the F-series 911 suffering the indignity of a Turbo-style bodykit, or at the very least, G-series impact bumpers. Even short-wheelbase 911s were subjected to such abuse in the pursuit of modernisation, presumably by the same folk who box-in beams and conceal fireplaces. Flicking through twenty-five-year-old copies of *911 & Porsche World* magazine, the evidence is all there in the classifieds. How about a narrow-bodied 1977 911 Targa 2.7 rolling on Cup alloys and sporting a Turbo rear wing? No, though not. Why did people do it? Because they could. Because of the ease in swapping parts from different eras of 911. And because it didn't really matter when these cars were cheap.

This is how the restomod scene as we know it started. I nearly went down the path with my left-hand drive 1984 Carrera 3.2 back in the early days of the restomod era (early 2000s). Well, why not? The car wasn't worth much and it was easy to buy a kit of parts to turn back the clock. Many owners were doing just that. When a 911 SC could be acquired for well under ten grand and a Carrera 3.2 for not much more, a reasonably convincing RS replica was well within reach. Nobody was too precious about doing so, either. These replicas weren't supposed to be anything other than a close-ish approximation. Then again, the real thing wasn't exactly expensive. Different times, you see.

LIKE CREATING AND FITTING A BESPOKE SUIT, IT'S A COLLABORATION BETWEEN DIFFERENT PARTIES

The movers and shakers of that early scene? Autofarm, Ninemeister and Paul Stephens, all of whom were building restomods in the mid-2000s and getting plenty of attention for doing so. Indeed, Paul Stephens was, by a good few years, the first to restomod (as it wasn't called back then) a 964, overcoming numerous bodywork challenges in the process and creating a seventeen-inch Fuchs replica with an offset working with 964 hubs. Yes, the 964 was something of a game-changer in terms of retro looks with modern Porsche performance, but it was also utterly unloved, meaning available examples could often be as cheap as Carrera 3.2s. There was therefore little in the way of risk or jeopardy — plenty of 911 enthusiasts were beginning to cotton on to the idea they could create their own take on a classic 911, but with the 964's then modern underpinnings. A compelling combination. Would Singer Vehicle Design exist (and would it be using the 964 as a base for its reimagined 911s) without these early restomod pioneers?

GREAT DEMAND

The Porsche specialists mentioned would happily admit their cars were built to a price the market would stand, but gradually, this began to change, along with customer expectation and demand. The trio of 911 SC, Carrera 3.2 and 964 became established restomod starting points, each serving as a blank canvas. Then as now, there is no right or wrong way to restomod. Stripped out, less is more, RS-look with all the trimmings of 'ducktail' spoiler and Carrera body script? You won't be the only one, but do it. A more restrained 911 S look? Why not? Something else entirely? Mixing and matching styling

Facing page Carrera 3.2 backdate wears Slate Grey, the colour famously covering Steve McQueen's personally owned 911 S, as featured in the movie, *Le Mans*

cues from different eras? A standard or modified engine? Suspension likewise? Boxster brakes? The only limits are, well, there are no limits, except financial ones. And no, not all the results are pretty. In fact, some are just plain gopping, but beauty is very much in the eye of the beholder and all that — one man's dream restomod will be very much another's occasional light snack. It's important to remember, however, pretty much each and every 911 restomod, no matter its underpinnings, has its own story and inspiration. This is largely the point.

Game-changing moments? Sure, you have to credit Singer with seeing the potential of the market and just how much folk were prepared to spend on their dream restomod, which is to say, really quite a lot. But then, rather like the rest of classic Porsche market, the game has moved on considerably. And while there might be creeping fatigue from many on the outside looking in, for the potential 911 restomodder intent on turning dream into reality, the market has never been stronger, with stiff competition amongst the protagonists driving up quality, innovation and sophistication.

Let's face it, we've all got a dream 911, whether standard or modified. Moreover, we probably know which specialist we'd commission to build it, too. It's a shame the barrier to entry is now, effectively, the cost of the donor car, but there's no use crying into our beers over this reality. It's hard not to conclude *it is what it is*.

My dream restomod? My cranial configurator is spinning up a few options, but I'll always opt for 'less is more'. The output of Singer Vehicle Design and Gunther Werks, for example, is a bit too blingy for my tastes. I would happily have my old sans wings Guards Red Carrera 3.2 back, swap out the Turbo Fuchs for fifteen-inch seven-eights and replicate the Carrera 3.2 Club Sport as best I could, from its blueprinted engine to its suspension. But, hey, that's just me.

Today, however, as a perfect representation of the restomod scene and market right now, as well as what motivates proponents of the movement, I can't think of a better 911 than the 1984 Carrera 3.2 Targa on these pages. Like creating and fitting a bespoke suit, it's a collaboration between different parties to achieve the result the car's owner desired, as Lakewell's Wouter van der Meer will explain in due course.

First, though, the car itself, which was re-engineered by Londerzeel-based Vintage Garage, the team led by renowned Porsche expert, Jerome De Brabanter. As mentioned, for the restomod route, the popular choice has always been either a 911 SC or Carrera 3.2 for the

Above Erdbeerkörbchen (strawberry basket) design is instantly recognisable when viewed side-on

Below 3.2-litre engine runs super-sweet after rebuild



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simple reason backdating a G-series to look like an F-series is relatively straightforward, with the necessary body panels and trim readily available. It's a well-established market and, in this instance, the steel panels are genuine Porsche items, including the long bonnet, slam panel, front and rear aprons. Simple, maybe, but involving plenty of manhours and the work executed to a standard the market demands, which is to say very high.

Slate Grey? Steve McQueen would be proud. Yes, this colour might be a bit ubiquitous, but to the car's owner, it's bespoke and exactly what he wanted. Retaining the Carrera 3.2's sixteen-inch Fuchs adds a hot-rod slant and a hint of attitude, as does keeping the wide Carrera rear arches, which no production 911 older than the G-series would have worn. Likewise, the twin-pipe exhaust, which borrows from the race cars of the era and is attached to a carefully rebuilt, blueprinted (but otherwise standard) 3.2-litre flat-six delivering 245bhp. Being an early Carrera 3.2, this 911 makes use of a Type 915 gearbox, providing an 'authentic' shifting experience. This, in case you were wondering, is the polite way to describe the 915's sometimes moody behaviour.

Needless to say, all the running gear, as well as suspension, brakes and fluid transfer pipework, has been renewed or overhauled to create a bespoke 911 restomod good as new. Okay, this is typical of a restomod. After all, there are only so many ways to do the job properly and to the sort of uber-high quality witnessed here. But the bespoke bit? As is so often the case for the restomodder, the interior is where the magic happens. It's a key element of a build very much open to personalisation. For this reason, we must switch attention to Lakewell and catch up with Wouter.

NATURALLY, THE DASH TOP, KNEE ROLL PADS AND DOOR TOPS HAVE BEEN REPLACED WITH LAKEWELL'S OWN MOULDINGS

We've dropped in on more than a few Porsche trimmers over the years, but it's fair to say Lakewell is in a league of its own, and that's before we get to the quality of the company's work. Rather than the usual 'premises on an industrial estate', Lakewell is based in an, er, well, it's a castle, really. The Castle of Veulen, to use its full title. Dating back to the mid-fourteenth century, this extensively rebuilt pile is located in the Hesbaye region of Belgium.

Lakewell's magic takes place in the vaulted hall of the South Wing, while Wouter and his family live in the adjacent quarter. "We spent seven years restoring the building," he tells us. "We wanted to combine heritage with what we do here. Customers come from all over the world. For them, visiting this venue is a bit like going on

Above Heavy duty 'basketweave' carpets owe more than a passing nod to 356 interior trim





Above and below Lakewell's care and attention to detail has resulted in a fabulous understated retrim

holiday. Our surroundings are important to the process." Specialising in Porsche (and, to a lesser degree, Jaguar) interior makeovers, Lakewell has spent the last two decades refining its practices. It even supplies Porsche Classic with products, such as dash tops and door cappings, and is a key supplier to the aftermarket, either by providing third-party trimmers with OEM-specification fabrics and other materials, or by reaching the end user via independent Porsche parts retailers, such as Design 911. "We created our own moulds for 911 dash tops, door cappings and knee roll pads. We also supply carpet sets direct to Porsche. They're made to exacting original specification. Porsche Classic focuses on the mechanicals, we major on a vehicle's interior."

And the bespoke requirements of individual customers? The Slate Grey Targa is typical of the process. "This particular customer came to us three years ago. He liked Singer Vehicle Design's cars, but wanted something simpler, sporty, yet still elegant, with what we refer to as 'quiet luxury'. We like to get to know our customers, a closeness helping us to sketch, render and create mood boards in keeping with their vision."

ARROW OF TIME

Clearly, we are at the higher level of restomod here, where a customer's vision guides the process. In this instance, the interior took two months for a pair of Lakewell's best trimmers to complete. They worked with five hides of the best Italian Nappa leather and a unique process developed by Lakewell to create the defining striping and weave to the seats, door cards, dash centre, achieved by way of a computer-operated loom. The result is a weave, but not in the traditional sense — it allows a full stripe, rather than the more usual chequered stripe. Look closely and you'll see an almost dimple effect, quite unlike anything we've seen before. "It's cleaner-looking," says Wouter, "but perhaps doesn't compensate for the extra work."

The seats are one of the few elements of the build not stock Porsche. They're from Cobra in the UK, but were supplied untrimmed with just their foam panels, ready for Lakewell to modify. To this end, the base foam has been altered to make the seat effectively lower, thereby delivering a less 'perched' driving position in this age of 911. Naturally, the dash top, knee pads and door tops have been replaced with Lakewell's own mouldings. The dash centre panel is machined from aluminium.

The interior is very much a 'greatest hits' mix of Porsche's back catalogue, with a more retro vibe applied to the exterior. The leather-trimmed carpet is pure 356 in its weave and colour, and extends to the front luggage area. The green-numbered dials could have come straight from a 911 assembled in the 1960s. If the door arm rests look familiar, it's because they're stock 356 equipment. Switchgear is bespoke. The steering wheel, meanwhile, is a Tactico RA drilled three-spoke, as opposed to the anticipated MOMO Prototipo. Modern touches, such as the pedals and footrests, are deliberately finished in black so as not to overwhelm.









The overall effect? To refer back to Wouter's earlier description, this 911 is indeed sporty, yet elegant. If your world is that of the very finest, the hand-made and the personalised, then this is exactly what your restomod should be aiming for. This car demonstrates the genre is almost an art form.

A word on the Targa element of this build. The standard semi-open-top roof panel has always been open to criticism, certainly in terms of its fit and finish — its 1960s design shows its age. Lakewell has made the Targa something of a speciality, retrimming and creating its own arms to clamp the roof in place. The result is a panel noticeably quieter and leak-free. This an upgrade well worth investing in, especially when a replacement Targa roof panel from Porsche will set you back an eye-watering fifteen thousand pounds.

The driving experience? With all the talk of bespoke this and custom that, it's easy to lose sight of one of the key objectives of the restomod movement: combining the retro look with modern road-holding and performance. The Carrera 3.2 underpinnings deliver exactly you would expect. Retaining a largely stock engine is in keeping with the overall build. This is no noisy hot rod, but a restomod built to the wishes of another customer could demand just that. There is no right, wrong or rule book to adhere to.

Considering he's been involved in the Porsche scene since 1995, we wonder what Wouter's view of both the classic and restomod market is right now? "The level of knowledge is significantly higher," he muses. "Customers are more informed, more particular and more sophisticated." We concur. Such a shift is very much in keeping with a market more affluent and more high-end than ever before. In housing speak, it has become gentrified.

Sticking with this analogy, it's easy to lament different eras, when a Carrera RS 2.7 replica could be put together for comfortably under twenty grand. If you did, and you're still in possession of the car, then hang on to it and enjoy. Or sell and reap the financial reward, but know to replicate such a build would be extremely painful in today's market.

THIS IS NO NOISY HOT ROD, BUT A RESTOMOD BUILT TO THE WISHES OF ANOTHER CUSTOMER COULD DEMAND JUST THAT

So, then. Has the restomod market peaked? Judging by the transporter loaded with 964s I spotted trundling up the M40 motorway recently (bound, presumably, for Singer Vehicle Design's UK headquarters), it would seem not. "Demand remains strong and Porsche people always want personalised," Wouter shrugs. New trends? "There's a limit to what can be done if you stay true to the Porsche parts bin, but the permutations are in no way exhausted. And there are many models to explore and restomod. For example, we were involved with creating the interior for the Nardone 928. There's the 914, too, which is, as yet, a relatively untapped market."

The world of Porsche is a broad church. The restomod scene is a cult within, made possible by the manufacturer's remarkable success in being able to mass-produce sports cars, whilst retaining the allure of exclusivity. The inspiration and motivation for the restomod army is to further create and personalise. Long may it continue. ✪

Above When referring to car body styles, Targa is, in fact, a trademark owned by Porsche

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PORK PIE

Long-term ownership has seen this 964 morph from standard to top mod, but how far and fancy should conversions go? We check out the customisation...

Words **Johnny Tipler** Photography **Dan Sherwood**

Nailed! Nearly, anyway. It's almost there — a hair's breadth from being the perfect 964. Owner, Francis Castelli, is still scratching his chin, and we'll get to future possibilities shortly. Sure, purists will grimace and heave a heavy sigh, but, don't turn the page just yet.

I have always viewed my cars as objects ripe for personalisation, chasing some elusive race car oriented goal, motivated by purposeful imagery, restrained or otherwise. Customising, if you will. Porsches in particular lend themselves to this frivolous activity. What's wrong with specification the manufacturer served up in the first place? Fair question regarding products often honed to perfection by Walter Röhrl on the Nordschleife. What's good enough for a two-time World Rally Championship victor ought to be good enough for you and me, right? Well, yes, but we all know stock specification means a level acceptable to the widest range of buyers. As marque die-hards, we can do better. Indeed, we can make a Porsche move faster, handle more sharply and achieve a look more distinctive, thereby making our ride stand out from the rest in a louche line-up. Does this justify muddling the appearance and capabilities of a perfectly usable and competent standard 911? I see no problem, providing the car in question can be returned to showroom specification if so desired. Francis feels the same way. Let's see what he's brought to show us, then.

HE WOULD ENDEAVOUR TO BRING TO REALITY HIS VISION OF THE ULTIMATE 964, MAKING THE CAR LOOK PURPOSEFUL, NOT GARISH

It's clearly black... or is it? Actually, it's metallic dark grey — in the sunshine, we note a sparkle. The aggressive stance is obvious thanks to the thirty millimetre drop in ride height. Much of the work has been carried out by the team at PIE Performance, porker-tuners *par excellence*, based in the countryside near Lavenham, Suffolk. Although Francis has owned his 964 for fifteen years, he was obliged to rescue it "in boxes" from an unsuccessful engine rebuild, which he asked the PIE crew to remedy. "I bought the car from a now defunct Porsche specialist in the north of England," he says. "In due course, I asked the company to service the car and, with mileage getting high, they told me it could do with a full engine rebuild. In December 2018, as a kind of fiftieth birthday present to myself, and much to the car's benefit, I reasoned a rebuild presented the perfect opportunity to increase displacement to 3.8 litres." Disaster loomed large. "The work proved to be beyond the firm's skillset. Consequently, in February 2020, I had the car and its component parts collected and shipped to PIE Performance."

Where the previous specialist failed, PIE excelled — Francis collected his finished car in November 2021 and immediately drove to the French Riviera. "It felt like pulling on your favourite old leather jacket!" he laughs. That particular razz took him through five different countries, providing the perfect opportunity to run-in the oversized flat-six and give it a decent shakedown.

Francis and 911s go back a long way. His stepfather, Stanley Palmer, was an amateur rally driver, competing in a two-litre 911 in the 1968 Monte Carlo Rally. By coincidence, the event was won by the late Vic Elford in a similar car. Mr Palmer collected a Carrera RS 2.7 from the factory in 1973, and young Francis enjoyed several continental adventures in it. As an affectionate souvenir, Palmer's rally stopwatch and his original British Racing Drivers' Club (BRDC) badge are mounted on the glovebox lid of his stepson's 964.

Francis owned a 2.2-litre 911 in the 1990s and acquired his 964 in 2007, immediately putting it to use as his daily driver. "The prices of pre-impact bumper cars had skyrocketed. With the 964, I opted to for what was, back then, a relatively unloved model." He gradually turned an 'okay' car into a party piece, driving it to his French hideaway every summer.

As far as the external appearance of the car was concerned, the prospect of a backdate was rejected. Likewise, an RS replica. Neither seemed the right way to go. Rather, he would endeavour to bring to reality his vision of the ultimate 964, making his car look purposeful, but not garish, as if it could have rolled out of Zuffenhausen like this. Aesthetics aside, he wanted a true driver's car as happy going to the supermarket for the weekly shop as to the Côte d'Azur, with a potential detour to a race track thrown in en route.

To chronicle the list of modifications PIE Performance has applied to this spectacular 964, let's begin with the colour. The car started life dressed in Marine Blue, but had been an assortment of hues by the time Francis took ownership. Today, his Porsche's personality is defined by the sultry dark grey seen here. "It's a colour from the

Facing page Tipler isn't sold on the front lip spoiler, but he's super-impressed with the PIE-built 3.8-litre flat-six powering this all-pawed 964



palette of South Korean manufacturer, Kia, which is a subsidiary of Hyundai. I like the way it flips from black to bluey-grey, depending on the light. Chris Lansbury, head of PIE Performance, treated the car to a respray when the front panel was reconfigured and the splitter added." We'll pick up on that little excrescence later.

We speculate about obtaining a more subtle RUF front panel or even a ducktail from the Pfaffenhausen concern, but Francis is wedded to the 964's standard electronic rear spoiler, both in terms of its function and its looks. "I like the fact it automatically extends and retracts," he shrugs. "There's something to be said for it being tucked away, when you've got the original unadorned arching 911 back-end to look at."

When contemplating an engine rebuild, owners often think about enlarged capacity and wonder 'what if?'. Although maintaining standard specification is frequently the most pragmatic option, Francis decided to go the whole hog and take his Porsche's air-cooled boxer from 3.6 litres up to 3.8. After all, Porsche led the way by building a hundred 3.8-litre 964 homologation specials at Weissach for the 1993 GT racing season, each car featuring a bi-plane rear wing and horizontal front splitter. "I figured an increase in displacement would give my car more low-down torque, which it has." He's spot on — the way his 964 pulled on empty straights between Holt and Fakenham while heading for our photoshoot was phenomenal, delivering the assertive performance of a healthy 964, and then some. "The car is pretty impressive in those situations. I'm sure top-end power isn't hugely different, but this air-cooled Porsche is now much more usable in all types of driving."

Specialising in Porsches — and 911s in particular — PIE Performance Tuning (PPT, the PIE Performance sub-brand) offers products and services ranging from bespoke mapping of ECUs to ignition kits, exhausts and suspension systems. Chris waved his PPT tuning wand at Francis' 964, and it shows. To this end, the engine's specification now includes a reground crankshaft, Mahle pistons, RS camshafts, a PPT ECU, wideband sensors and ignition kit. An oxygen sensor was inserted into the Hayward & Scott stainless steel exhaust system. Power is transformed.

The engine bay makes continued use of a standard airbox and filter, which Chris reckons breathes better than an aftermarket cone filter, a conclusion reached after dyno tests with and without. There's an RS clutch and lightened flywheel, too. Francis admits to having reservations on this front. "Many owners told me 964 Carrera 4s can be notoriously bad to drive when equipped with an RS clutch and flywheel, a problem associated

Above Bilstein coilovers, Powerflex polybushes, Eibach springs, staggered replica Fuchs and sticky Michelin rubber ensure this personalised Porsche clings to the road in all conditions



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Above Hayward & Scott exhaust peeks out from the rear bumper, while grille badge lets other road users know there's something unusual beneath the engine lid of this personalised 964

with the Carrera 4's standard ECU software not keeping pace with sudden drops in rpm and when additional load is at play, such as air-conditioning. Stalling is a common complaint, but the PPT ignition kit eliminates the problem, meaning the engine never cuts out on me, much to my relief."

The suspension was completely overhauled and now incorporates Powerflex polyurethane bushes, Bilstein B16 coilovers and Eibach springs. With a grounding in sporting 911s, Francis was always destined to pursue the lowered look.

"When I bought the car, the ride height was quite high, though lower than standard. When the car reached Chris and the team at PIE Performance, I asked them to fit lowering springs, which they did, but as part of a Bilstein B16 makeover. The car looks so much better now."

THE CABIN FEATURES SEATS LIFTED OUT OF A 964 TURBO AND HAS BEEN REUPHOLSTERED, FRONT TO BACK, IN GREY LEATHER

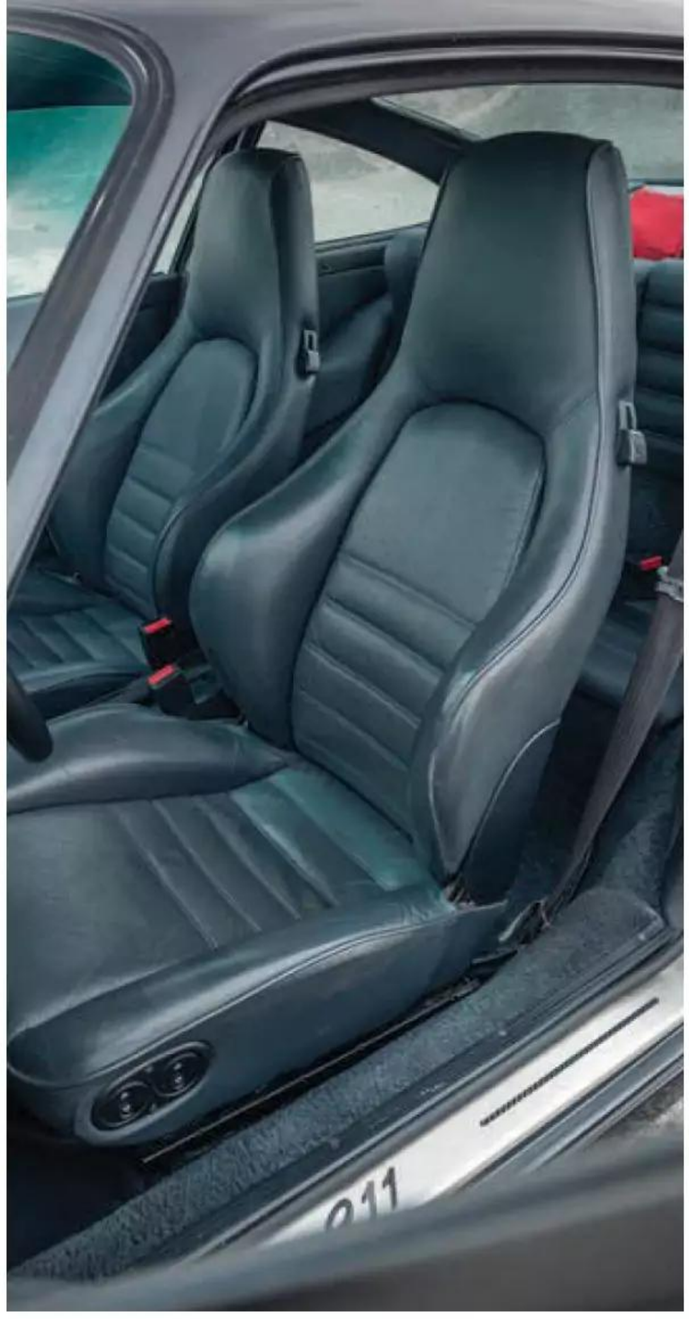
Adding to the enhanced handling, a beefy Wiechers strut-brace resides up front. Beside the neighbouring battery is a master switch by Autolec, a company founded by the aforementioned Stanley Palmer. The RS-style carpet in the luggage compartment, which also features a Powder fire extinguisher, was sourced by PIE, while the wheels are oversized Fuchs replicas from Group 4 Wheels, sprayed black and shod with Michelin Pilot Sport Cup tyres (225/40 ZR18 at the front and 265/35 ZR18s at the back). Standard 964 Carrera 4 calipers and discs are bolstered by Pagid RS pads and fluid with a high-boiling point.

There's no doubt the faux Fuchs set things off splendidly, and the wide external offsets allow the wheels to fill the arches completely. A succession of other styles preceded the Group 4 Wheels design, though.

"I was in two minds about fitting Fuchs-style wheels," Francis admits. "I thought they might be too much of a reference to Porsche's past. I've already had the car rolling on a set of Cups, as well as Speedline split-rims, but when the Group 4 Wheels products went on, it was clear they were the perfect match to my Porsche." He's also thought about converting his Carrera 4 to rear-wheel drive, ditching a hundred kilograms in the process, but is perfectly happy with how the car currently performs. A job for later down the line, perhaps?

Viewed from the front, one of the standout details is the headlights. Recognising standard 964 headlights are little brighter than a pair of candles, the intriguing lamps now in place are LED Techlight units. Sourced from independent Porsche parts retailer, Design 911, they feature prominent individual lenses for dip and main-beam and positively transform night into day. The car's front bumper panel houses 993-sourced fog lamps, indicators and the later 911's sidelights, as well as RS-style brake cooling ducts.

The cabin features seats lifted out of a 964 Turbo and has been reupholstered, front to back, in grey leather with blue stitching. A flat leather-rim MOMO Prototipo wheel gets the same treatment. From the driving seat, this feels like a brand-new car. Talking of which, there's a plethora of great driving roads in North Norfolk. We hook up with them. Power delivery is instantaneous, especially if I drop a cog, rushing for the Big Skies vanishing point. This 964 is impressively fast —you can sense the greater torque and depths of power surging from the vaults of the 3.8-litre engine. It feels as if it would go on dishing up grunt for some considerable time, if only it wasn't for the mobile chicanery of holiday traffic requiring me to back off. What really stands out, however, is the











smoothness and lightness of this 964's steering around bends. This, for me, is a paradox. By common consent, prevailing wisdom is the lack of a front driveline means the Carrera 2 is lighter than the Carrera 4, which should make it slightly quicker. In reality, there is likely to be more difference between the performance of individual 964s than between Carrera 2 and Carrera 4 variants, just because of wear and tear and the unique traits of each car. In terms of handling, though, the standard Carrera 2 has a sharper and nimbler feel, which appeals to purists who believe the security of the Carrera 4's all-wheel grip and traction takes the edge off the thrill element of motoring in a 911.

Exiting tight bends, the steering of the stock Carrera 4 weights up as torque is applied to the front axle, giving ever such a slightly ponderous impression, and the brakes have a different feel because the Carrera 4 runs a high-pressure system. Naturally, if the roads are damp and if push comes to shove, the all-pawed Porsche is a safer and more secure proposition. In short, the Carrera 2 has a slightly more agile feel and its steering is a bit more sensitive, while initial turn-in is sharper. By comparison, the Carrera 4 has slightly less sensitivity due to the extra weight in the front and, as speed increases, will understeer at turn-in and through the corner, though it generally feels very planted. The Carrera 2 turns in more precisely and can be balanced on the throttle through the corner, making it marginally — theoretically — quicker on a dry track, but wet conditions favour the Carrera 4, making it easier to drive overall.

Although the Carrera 4 carries slightly more weight, it isn't noticeable in acceleration, top speed or fuel economy. That's what the text books say. The reality check comes when I'm behind the wheel of Francis' 964. It may be a Carrera 4, but the ease and smoothness with which it negotiates cambered esses is awe-inspiring. The lightness of touch to the steering belies the commonly held belief Carrera 4s lack feel and feedback.

Lowered as it is, this example boasts simply sublime steering and brilliant road handling. Judge the braking, get the gear and it's so beautifully balanced as it dives into every bend, with the nose-lightness you'd expect of a Carrera 2, which you're aware of through hands on the wheel. The ride is spot on, too. Not over-firm, nor intrusive, just flowing over the surfaces, plenty of which are indifferent around here, the more rustic we get.

THIS WING-ENDED SPLITTER MIGHT SUIT AN ASPIRANT 996 GT3, BUT IT SAYS SOMETHING ELSE ABOUT THE 964

This is certainly one of the best 964s I've had the pleasure of driving. There are, however, two or three aspects I'd change or improve upon, starting with the brakes. I know we're spoiled by ceramic discs these days, but this 911's anchors need sharpening up a bit. Less largo to the rallentando. Then there's the noise. It just ain't loud enough. More of the guttural flat-six, please — if you're gonna do it, do it. The passenger seat is compromised in going to-and-fro by a subwoofer and, though I don't want to dwell on the front splitter, here's the thing: fashions in car looks move on, sometimes in circles. Retro is now passé, and tweaking wot-u-got into a Mad Max simulacrum is the new backdate.

Once upon a time, in the mid-1980s, long-bonnet classic 911s were 'modernised' as much as possible. Truly, anything goes, as long as it looks right. This wing-ended splitter might suit an aspirant 996 GT3, but it says something else about the 964 — it doesn't belong, certainly not the roadgoing side of a 993 GT2.

Francis and Chris will conspire to switch it for something more subtle. And then I think they will really have served up — no gristle — one tasty PIE porker. ✪

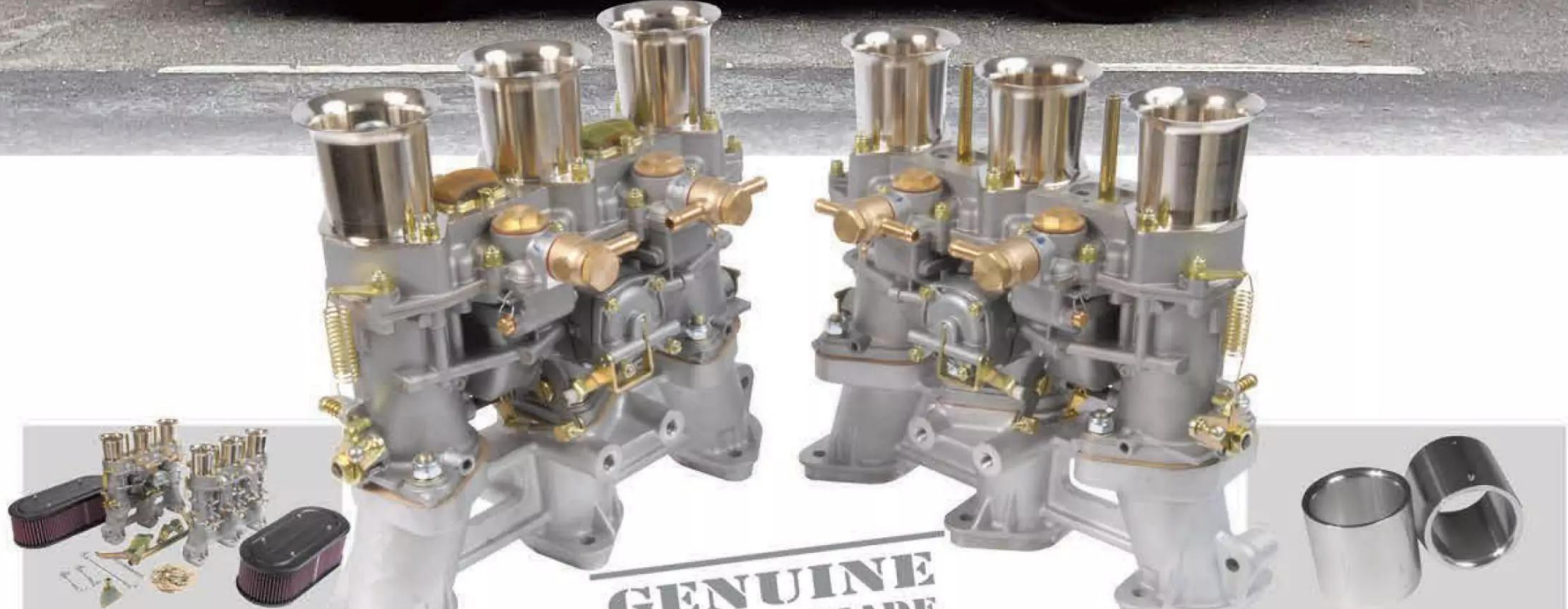
Above Francis' stepfather's rally stopwatch and BRDC badge are mounted on the dashboard of this Carrera 4

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TWO-TONE REVIVAL

Presenting Bobby Ball's personalised 911, a sensational split of grey lifted from the classic Jaguar colour catalogue and House of Kolor's iconic Candy Apple Red...

Words **Johnny Tipler** Photography **Dan Sherwood**

Too much too young? Not if you're Bobby Ball, who came to his 911 from scooters of the Vespa and Lambretta variety, beloved of the mod fraternity, from the early 1960s right up to, well, the present day. While many of us would be happy to create a backdated 911 and leave it with period-coloured bodywork, our man has taken the aesthetic of his Porsche to a different level. A two-tone one, in fact. It's a reflection of the colourific detail you might find on one of his restored scooters.

Sure, his air-cooled classic has all the attitude of a late 1960s or early 1970s Stuttgart-crested competition machine, but the most arresting aspect of this 911 is its unusual colour scheme. My dad had two-tone cars in the early sixties, but they were prosaic offerings from Austin and Morris, where the top half of the car was cream and the bottom half pale green or blue. This 911 turns the two-tone concept on its head (or rather, its side) and splits it down the middle, with one half red, the other half grey. You could be looking at two different cars.

CAPACITY IS NOW 3.5 LITRES WITH BREATHING TAKEN CARE OF BY WAY OF PMO CARBURETTORS

We've come to Cottesmore, Rutland, with its wonderful hilly landscape and swooping smooth-surfaced A-roads. Bobby recounts his car's recent history. "It started life as a right-hand-drive 2.7-litre 911 and was manufactured in 1976. The bloke I bought it from planned to carry out restoration following ten years of ownership, but his health deteriorated and his carport fell in, landing directly on the 911. The car was derelict. I bought it as a project. It didn't look too bad, but it was pretty far gone. Now I think about it, the overall condition of this car was really very poor indeed."

Bobby isn't in the slightest bit fazed by mechanical work or body restoration. He relied on past experience with scooters and bent his mind to apply his skillset to the 911. This is an important point: he's done almost all the work on the Porsche himself. Yep, from bodywork to drivetrain, he's taken care of it. "In the 1980s, my mates and I were into the scooter craze. I suppose owning and customising a 911 is a logical progression? Regardless, while I was at school, I worked in a bodyshop, learned automotive restoration techniques, then went into building and restoring scooters. My dad always owned old cars, meaning I was exposed to them from a young age and regularly helped him with repair, maintenance and restoration jobs. I simply learned how to use spanners when I was young. I remember Dad owning a vintage Riley, manufactured in the 1930s. I inherited the car, but I just couldn't get on with it. It wasn't for me, which is why I sold it. I needed to replace it with something else to keep his spirit going strong, though. This 911 was advertised as available to purchase via eBay. The car was done-up to look like a 930." There were specific hurdles to be cleared, though. "Up to this point, I'd never MIG-welded. I'd gas-welded and TIG-welded, but not MIG. I have to say, I found it easy to learn and ended up getting on with it very well."

This striking Porsche has plenty of 'go' to accompany the 'show'. "Someone had played about with the 2.7-litre flat-six in an attempt to get it going," Bobby confirms. "Across the course of a month, I stripped the unit and got it operational, but it didn't sound good. Around this time, I was made aware of a 3.2-litre flat-six being offered privately by a 911 enthusiast in Cornwall. Long story short, we exchanged engines, although I also paid £3,500. I discovered the larger-displacement boxer to be making use of cases machined to accommodate 964 barrels. Consequently, capacity is now 3.5 litres with breathing taken care of by way of PMO carburettors. Output is close to 270bhp, but I find the engine incredibly torquey. You hardly get the revs up on these roads. You'd want to be on a track to get the most out of the horsepower on offer." Bobby knows whereof he speaks, having competed in a Nemesis two-litre sports-prototype. "I did a spell of racing," he smiles. "In terms of steering and feedback, my 911 drives as good as the Nemesis."

The engine build wasn't straightforward. "The donor Carrera 3.2 donor car experienced a fire at its rear. Flames had extended down one bank, taking out the air filter and everything that side of the engine bay. The PMO parts were shipped back to America to be rebuilt. I took ownership a few years later, but the engine hadn't covered many miles following the remedial work. To be on the safe side, I stripped and reassembled the unit, replacing all seals and various other parts. I loved the work and spent a full month cleaning every visible part, making the boxer spotless. Wayne Dempsey, founder of Porsche spares and restoration specialist, Pelican Parts, wrote a manual documenting the rebuild process, which I followed to the letter. I also took influence

Facing page One of the most visually arresting classic 911s we've seen in recent times



from instructional videos on YouTube." Proof, then, rebuilding an air-cooled flat-six is a job an enthusiastic DIYer can manage from home. Bobby offers a word of caution, though. "You've got to be accurate in your measurements," he stresses. "Wayne explains all in his brilliant book, but it's vitally important to observe tolerances and measurements to ensure everything fits just-so. My approach was to look at the engine parts before me and, if I doubted a part was within the tolerance, I bought a new replacement item." As you'd expect, the engine makes use of new rings, shells and bearings.

The exhaust is a decent-sounding Dansk system with SSI headers. The gearbox was provided by a breaker in Leeds. "Like the engine, the transmission came from a donor Carrera 3.2 and is accompanied by a dedicated oil cooler. Essentially, it's a late Getrag G50, which handles increased power and torque much better than earlier 911 gearboxes. I didn't perform any modifications — all I did was open the unit and clean it. I'm fairly confident it was rebuilt under the previous owner's rule, a conclusion I came to after noting all nuts and fasteners appeared to be as-new."

Bobby tackled the bodywork single-handedly, mostly from the confines of his domestic double garage. It was a monumental task. "When I was taking the car apart, I realised the metalwork was in bad shape. I didn't know whether to sandblast it or dip it in acid. With sandblasting, unless you get the underseal, the material is going to bounce back at you and it's going to take forever to complete the job. I realised it would be a lot of work and therefore took the shell to an acid-dipping business in Birmingham. What I got back was a nightmare! Holes everywhere, even in the roof. The inner wings were especially bad. I braced the body, put a laser on it and got everything dead level, observing factory measurements. I used two lasers. In fact, one of the rear suspension pick-up points was out by a millimetre. Fortunately, Porsche allows for a five-millimetre discrepancy, meaning I didn't need to put the body on a jig. Instead, I made a really good frame to hold it all."

PROOF REBUILDING AN AIR-COOLED FLAT-SIX IS A JOB AN ENTHUSIASTIC DIYER CAN MANAGE FROM HOME

Out went compromised metal, in came fresh new steel. The front end is all new, including suspension pans and Dansk inner wings. "I made a jig picking up all the points of the original parts, cut out the remains of the inner wings, put the new ones in and made them fit the jig. I then welded them in place, progressing to the inner sills, the floor, outer sills and kidney bowls. I seam-welded the shell and strengthened up the shock turrets."

It wasn't a question of 'no expense spared', though. "Believe it or not, this is a budget build," Bobby insists. "I'm not throwing money at the project. The chap who was advertising the rear wings, they'd already been on a car, which had been restored on a rotisserie. When it

Above Bobby carried out almost all the work on this awesome-looking 911 himself

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came to putting the doors on his car, they wouldn't fit. Somehow, the shell had deformed on the rotisserie. The car was taken to a different restorer, who wanted to fit new wings. I bought the discarded panels, which needed little more than tidying up. Turns out, they're genuine 911 Turbo parts, bought new for before being abandoned."

The wings, doors, front lid and ducktailed engine lid are manufactured from fibreglass. "They were on an RS-alike," Bobby continues. "The guy selling them had aluminium alternatives made for his car. I'm not happy with the bonnet, chiefly because the rams are forcing the sides up, a consequence of the fibreglass being so light." Some people make use of a simple metal stay, but that's a consideration for another day. The back bumper panel and front valance were sourced from Club Auto Sport at Halesowen.

The car's roof was peppered with damage, not limited to near twenty dents inflicted upon it from the collapsed carport — the metal had been stretched, encouraging Bobby to learn how to 'heat shrink'. "I spent a week by a big stove, warming the metal and tapping it back into shape," he says. The running gear got a similarly comprehensive makeover. "I've converted it to coilovers, an update working very well on this car. Put it this way, fifty miles per hour feels like eighty. Sorted suspension and the ability to take corners quickly makes an old 911 feel like it is travelling much faster than it is. It's brilliant because you can have fun on four wheels without putting your driving license at risk."

As the purchaser of Fuchs replicas from Group 4 Wheels, the fifteen-inch Fuchs-like Braid rims on Bobby's superb 911 immediately caught my eye. "They're nine inches wide at the front, eleven at the rear. With such big width at the back, the rear-end doesn't break away easily, unless the road is wet or you're really trying, of course." Each wheel is shod with Pirelli Cinturato P7s (225/55 front, 235/40 at the back). "Many Porschephiles have told me Michelins are a bit grippier, but I went with Pirellis because, frankly, they were much cheaper and promised greater longevity. I'm coming up to six thousand miles on this set with very little wear."

Some of that distance was logged when Bobby took the car to the Austrian Alps earlier this year. "That was a good trip. I enjoyed hammering along the German

Above Capacity of the donor flat-six is now a cool 3.5 litres

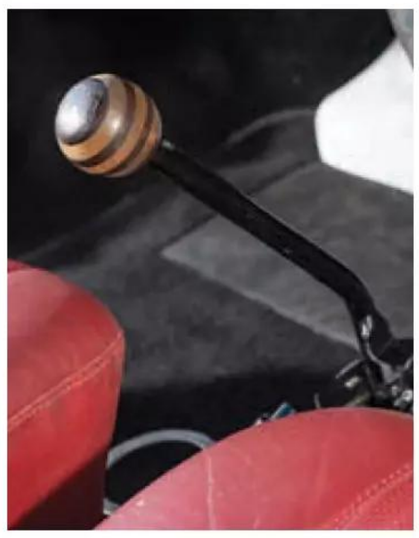
Below Can't decide between two colours? Why not take a leaf out of Bobby's book and paint your 911 in both?!













Above A huge amount of time and effort has been invested in this Porsche, including the design and careful execution of many different mods

Below Centre-frunk fuel filler has become a staple of the classic 911 restomod scene

autobahn at 120mph. I really wouldn't want to be going any faster in this car, though. I filtered onto a slip road and forgot what speed I was doing. All of a sudden, the back end broke away. I kept my foot in, but for a moment or two, I felt like I was in my race car. I took the drive a bit easier after that. I ventured down to the Rhine, near Strasbourg, then to the Porsche Museum in Zuffenhausen. From there, I took the car across the Austrian Alps and explored the area for a couple of days, before heading back up into Germany. In the UK, I've really only used the car for attending shows."

The interior hasn't escaped Bobby's attention, albeit he hasn't given it the same treatment as the body and running gear. "The seats came with the car and have been re-covered. I commissioned someone to do the work. It's the only aspect of the build I'm not happy with, primarily because I didn't do it myself. The door liners are ply. I made RS-style inner skins with thong-type pulls. The leather isn't that hard to get hold of. You buy great big hides, which are quite delicate. I took the seats out of the back and installed a toolbox in their place. To be honest, it makes chucking bags or a suitcase in the rear much easier." A rarity exists in the shape of the steering wheel, which reads *Abarth*, but is, in fact, a slightly dished MOMO Prototipo made for Abarth and fitted to classic 911s by connoisseurs.

A RARITY EXISTS IN THE SHAPE OF THE STEERING WHEEL, WHICH READS *ABARTH*, BUT IS, IN FACT, A SLIGHTLY DISHED MOMO

One of the fundamentals of a restoration is the wiring loom. Bobby went the whole hog. "I rewired the car myself. A pukka Porsche loom would have cost around three grand. I bought a loom intended for an American hot rod. It's got every single wire you could ever want, allowing for power windows and every other electrical system you can think of. Obviously, it's a harness designed for a left-handed vehicle with its engine at the front. I had to extend the wiring to reach the flat-six at the back, and the dashboard wiring was a little complicated, but I like a challenge and I learned much about automotive electrics while doing the job. I went from being anxious about the work to understanding it. It really isn't very difficult once you get stuck in."

The obvious question is what prompted him to produce a two-tone 911. "I was at a Porsche show and some of my fellow attendees were criticising a display car for not having quite the correct colour paintwork. There and then, I reasoned I wanted to be as far away from that kind of purist attitude as possible." What









we have here are two distinctly non-Porsche colours. The grey is a Jaguar shade from the 1960s, while Candy Apple Red is a gorgeous hue from American paint manufacturer, House of Kolor. It sits over a black base, kind of fluctuating. As you can see from our photographs, it looks amazing in direct sunlight.

The central stripe was achieved using Bobby's laser equipment. "It's only a builder's laser," he shrugs. "Mapping the stripe was difficult because every panel is curved. You have to apply masking tape several times until you hit the sweet spot. I'm under no illusions though — this 911 is piling on miles, which means the paintwork is going to get chipped. I'm okay with this. I *want* to use the car, just as Porsche intended."

What inspired the RSR-style central fuel filler? "The standard filler features a snake-through pipe travelling through the wing and into the tank. There were a lot of bits to it. They were rusty and horrible, hence the decision to install a central filler, which I love. I welded it into a brand-new fuel tank." The front compartment is traversed by an aluminium strut brace and houses a 993 spare wheel because the original tyre, as Bobby explains, "is fifty years old. I wanted a spare wheel because I don't fancy relying on a third-party's low loader if the correct tyre can't be sourced local to incident. Quite frankly, I can do without the stress."

There are one or two other sophistications. The pedals, for instance, are housed in a bespoke pedal box. "The car makes use of split-braking with AP master cylinders. A bias bar allows for fine-tuning distribution of stopping power, much like a race car. I installed a bigger oil cooler, too. The braided Aeroquip pipes go through stainless tubing I welded in the sill, meaning they're protected. In other words, they don't travel underneath the chassis, thereby avoiding being crushed when I go over a particularly pronounced bump."

FOR SURE, BOBBY'S PORSCHE IS A MASTERPIECE OF CUSTOMISATION WITH A UNIQUE AND INTRIGUING LIVERY

What are his future plans for this sensational SC? "I intend to do little more than enjoy this 911 from the driving seat. I don't know if I'd carry out another Porsche restoration. They're very expensive. I've built this car across five years, during which I hunted about for bits on eBay and made many parts myself. Even so, the overall cost of restoring this 911 was high."

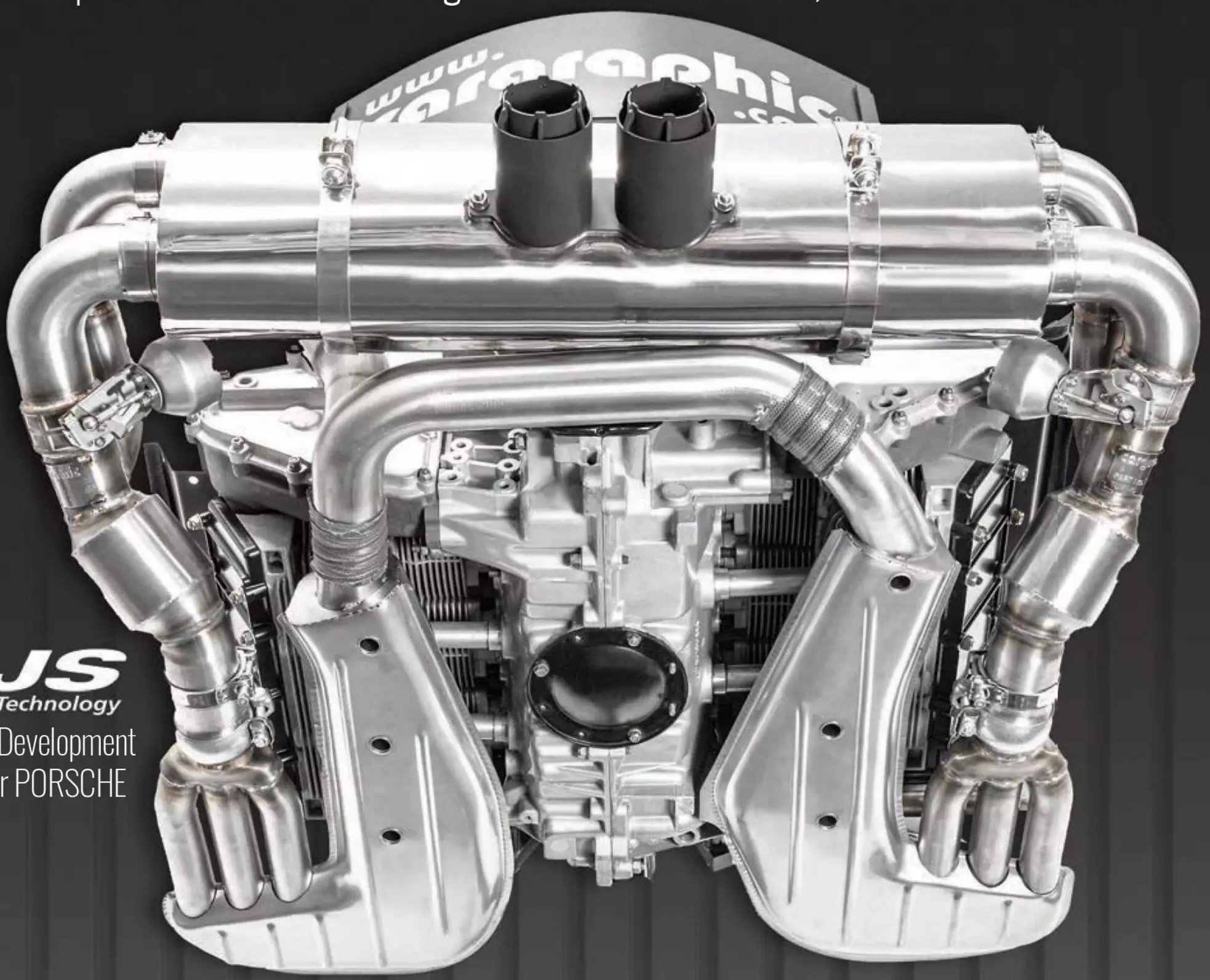
For sure, Bobby's Porsche is a masterpiece of customisation with a unique and intriguing livery. All credit to him for resurrecting the car, especially as he did it as a one-man band. Maybe that should read *two-tone* band? As a fan of scooters, ska and two-tone, I admire his artistic tables-turning take on how some enthusiasts used to approach bodywork decoration. Will this be the start of a new trend, though? Somehow, I doubt it, but you never know. Revivals come in different guises. ✪

Above We're now thinking of all the other amazing colour combinations this design might work with

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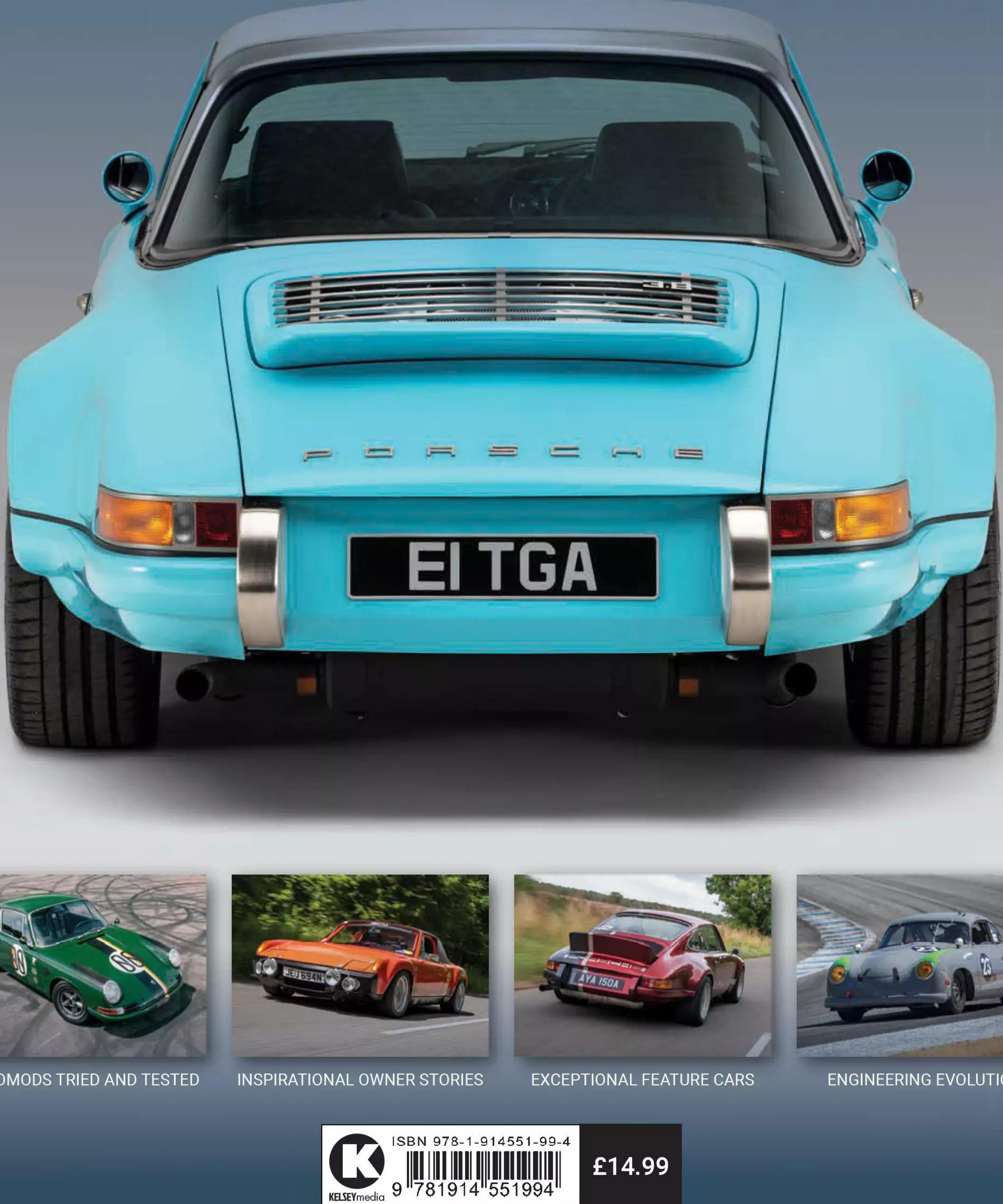
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