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Classic PORSCHE

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SUBSCRIPTIONS
Nine issues of *Classic Porsche* are published per annum
UK annual subscription price: £49.50
Europe annual subscription price: £59.00
Rest of World annual subscription price: £64.00

UK subscription and back issue orderline: 0845 241 5159
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Kelsey Publishing Ltd, The Granary, Downs Court, Yalding Hill, Yalding, Kent, ME18 6AL, United Kingdom

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Tel: 0906 802 0279 (premium rate line, operated by Talk Media Sales on behalf of Kelsey Publishing Ltd. Calls cost 65p per minute from a BT landline. Other networks and mobiles may vary. Lines open Monday-Friday, 10am-4pm)

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Distribution in Northern Ireland and the Republic Of Ireland
Newspread Tel: +353 23 886 3850

PRINTING
Precision Colour Printing, Telford

KELSEY media

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GREAT EXPECTATIONS

Welcome to a special issue of *Classic Porsche*, in which we're celebrating ninety years of Porsche Engineering services. Across the following pages, you'll read about some of the standout projects Porsche has been involved with during nine decades of engineering excellence, from military hardware through to ground-breaking design projects for other car makers. We also revisit early milestones in the Porsche sports car story, including development of the first 550 Spyders and our cover car, the last-known 901 to survive to the present day. Subjected to a recent restoration at the hands of none other than RUF Automobile, this sensational Porsche is one of six 901s Alois Ruf Jr and his team have resurrected in recent years — an amazing statistic when you consider how few 901s were produced.

Many of you will have noticed the increase in pagination *Classic Porsche* has enjoyed in recent months, an indication of the magazine's increased popularity on the newsstand, as well as with subscribers and our advertising partners. I'd like to take this opportunity to welcome all our new readers and to thank my talented team of contributors for their hard work in helping to produce each issue of *Classic Porsche* during the challenging times we're living in.

As we bid farewell to warm weather and welcome autumn, we now turn our attention toward the year ahead. 2022 might be hurtling our way like a runaway train, but there's plenty to get excited about in the coming weeks, not least the wealth of classic car shows taking place. Other than an opportunity to wax lyrical with like-minded Porschephiles, these events promise to showcase some of the amazing projects enthusiasts and professional restorers have been working on during lengthy periods of lockdown. We can't wait. See you there!

Dan Furr Editor
@DanFurr

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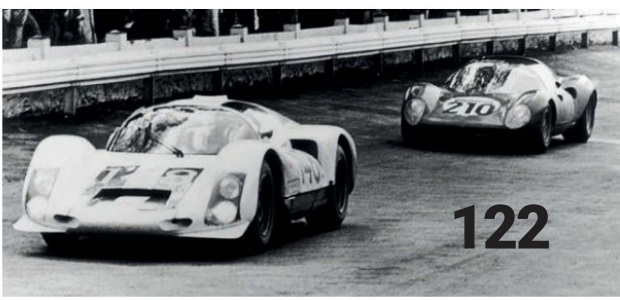

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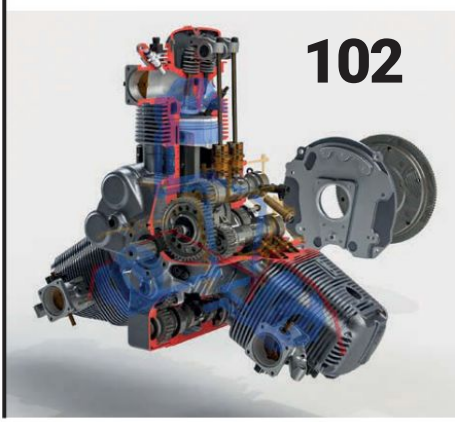

FRUIT LOOP

Fifty years young, this Signal Orange 911 started life as a 2.2-litre T before being adapted to ST specification and, more recently, being subjected to a full body restoration in readiness for scrutiny from Porsche Motorsport legend, Jürgen Barth…

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

When is a race car not a race car? You're looking at it. Once a humble 911 T — one of only fifty examples sold in Great Britain back in 1971 — and subsequently built into an ST-aping track tool, this recently restored air-cooled classic carries an FIA historic technical passport following approval from none other than former Porsche racing driver and esteemed works engineer, Jürgen Barth. The Signal Orange stunner was then tamed for regular road use through the appointment of a wealth of modern electrical systems and styling upgrades. A 911 for all seasons, then?!

Our story kicks off at the former royal ordnance depot at Weedon Bec in West Northamptonshire. A sprawling array of red brick buildings dating back to 1802, this long-time military facility is now home to various small businesses. Among them resides Workshop Seventy7, a company regular readers of *Classic Porsche* will be familiar with through the various 911s to roll out of the firm's doors and straight into the line of fire of our cameras. In fact, Workshop Seventy7's fifth build, an utterly transformed 1973 911 T — fully restored, painted Aubergine and finished with a sympathetic twist of hot

rod — graced the cover of our January issue last year. That's not to say Workshop Seventy7 focuses solely on 911s. Granted, company owner, David Lane, counts an exquisite 911 E powered by a 325bhp 993-sourced flat-six as his personal Porsche (the second Workshop Seventy7 build and something of a demonstrator for the work his talented team produces), but a 550 Spyder replica and a 912 count among the ten projects he's released into the wild under the company's Oshe brand. Away from Stuttgart speed metal, a 1971 Alfa Romeo 105 GTV 2000 and even a 1960 Triumph Tiger T100 Bobber motorcycle have been given the Oshe treatment, contributing to a tally of ten major builds. The zesty 911 seen here is the seventh in the series.

"A customer visited our workshop and liked what he saw," David recalls, remembering the Signal Orange Porsche owner's reaction to seeing the ducktailed, beige-hued 911 E through Workshop Seventy7's tall, church-like windows. The car oozes road presence, rolling on staggered seventeen-inch Fuchs-style rims tucked beneath huge haunches and making a satisfying roar from the prominent twin tailpipes poking out from the rear. It's also a regular sight at classic car shows, including the increasingly popular Sunday Scramble at

Bicester Heritage. “He was smitten with the build and, a short while later, we were drawing up an equipment wish list intended to result in a similarly tuned 911. Before we could source a donor car and put our plan into practice, however, he visited DSD Motorwerks in Essex, fell in love with a track oriented 911 T kitted-out with ST parts and bought the car, subsequently presenting it at Workshop Seventy7 with a request to use his air-cooled acquisition as the starting point for a build mirroring the specification of my 911 E restomod.”

NOT SO MELLOW YELLOW

Loaded with a works-supplied race and rally kit, painted yellow and carrying lightweight body panels, this was very much a Porsche intended for motorsport use. It carried the battle scars to prove as much, too. “It was far from pristine,” confirms David. “Quite appropriate for a hard-driven track car, where function trumps form and abuse is the order of the day, but knowing our client wanted a show-quality finish, it was clear this particular Porsche would need a significant amount of cosmetic work.” The customer confirmed as much when his new toy was up in the air — while the car was raised on Workshop Seventy7’s ramps for inspection, its excited owner caught sight of the Aubergine 911’s underside, exposed when it too was aloft. Treated to the same high standard of finish as the car’s body panels, the ceramic coated stoneguard bore the all the hallmarks of a comprehensive nut-and-bolt restoration.

At the instruction of their enthusiastic client, the challenge David and his team faced was to strip and reassemble the new arrival into a pristine ST evocation capable of gaining the aforementioned historic technical passport (used by the FIA’s technical delegates to check the conformity of an historic competition car). As outlined in last month’s issue of *Classic Porsche*, the ST was descended from the 1967 911 R factory motorsport machine. 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 TR, 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 TRs were built and campaigned by professional and amateur race and rally teams.

A 2.3-LITRE SHORT-STROKE FLAT-SIX BASED ON A NEW OLD-STOCK 7R NON-SERIAL STAMPED CASE

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 ST 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 with 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 ST designated as race cars. Like the TR, the ST designation was an in-house Porsche amalgam of existing model identifiers: an S engine and the lighter T chassis.

Above Slotted bumper looks great and carries function, sending cool air to the air conditioning condenser and the oil cooler

Above Full roll cage made squeezing the seats, window winders and single-piece dash pad a little tricky

The first thing for David to ascertain was the structural integrity of his customer's car. After all, it had been used in anger at race circuits for many years. "The shell was stripped and sandblasted back to bare metal. We found corrosion in the usual places, such as the scuttle, kidney bowls, driver's door and around the rear seats, but nothing major to worry about. The body was put on a jig at Cage Craft in Daventry to confirm it was square, before Cage Craft owner, Lee Adams, proceeded to weld in an FIA-compliant roll cage. Tuthill Porsche removed the stubborn underseal by way of high-pressure water blasting, and Normandale, one of the most reputable motorsport paint finishing companies in the UK, took care of the metal repairs, fabrication, further smoothing of the hand-hammered steel wheel arch flares and, of course, applied the striking paintwork."

The body was also strengthened in key areas, including spring plates, around the top mounts and across the rear suspension supports, before being painted Signal Orange. "In truth, it's a variation on the OEM colour, which contains eight percent black," David tells us. "We produced four swatches for the car's owner, each with varying degrees of black introduced to the mix. The one he settled on contains just two percent black. It's a subtle difference, but one personalising his 911 away from all the other Signal Orange examples out there."

DSD Motorwerks supplied the car with two engines. The first was the original 'matching numbers' 2.2-litre flat-six, complete with small fan housing, SSI heat exchangers, a later alternator and an ST-specification silencer. Formerly considered the car's 'road' engine, it now sits on a display stand awaiting further instruction. The powerplant currently propelling the car is the second, more powerful boxer, taking the form of a 2.3-litre short-stroke based on a new old-stock 7R non-serial stamped case. A 66mm crankshaft, S-specification connecting rods, JE pistons, Mahle barrels, twin-plug heads, a period-correct distributor, a revised valvetrain (new guides, three-angle seat valves, race-spec valves, titanium valve springs, retainers and keepers), GE60 camshafts, ARP fasteners throughout, race headers, a high-flow fuel pump, a mechanical fuel injection pump rebuilt to 2.3 specification, a lightweight flywheel and amber shrouds form part of the package, along with many other period updates.

The transmission is the original 901 five-speed, rebuilt and strengthened, as well as being treated to a lightweight competition clutch, while the 911 parts bin was raided for beefier brakes and suspension components — Carrera RS 2.7 calipers and a matching front anti-roll bar are joined by a Carrera 3.0 rear anti-roll bar. The Koni adjustable shocks are fully rebuilt and a modified Tuthill Porsche adjustable pedal box has been put to good use.

NOISE BOX

Clearly, for a competition-inspired 911, huge attention to detail ensured unsprung weight was kept as low as possible, which is why the car lacked sound deadening,

Right Retrimmed 914/6 steering wheel draws the eye away from the many additional switches controlling the various electrical systems added after the FIA passport was granted

its glove box, rear seats and dash trim, thereby replicating original ST specification. "It took a while to get the technical passport sorted," David recalls. "We waited a year to get the paperwork due to the original FIA inspector sadly passing away mid-evaluation and his replacement having to go over all documentation from scratch before passing it to Jürgen Barth — presently serving as a Porsche factory historian — for approval. I was thrilled when we got the green light, but it didn't take long for the car's owner to recognise his 911 was less than civilised for extended periods of regular road use. With this in mind, he decided to further personalise his Porsche, asking us to add much in the way of modern comfort equipment." Nowhere is this more evident than in the 'frunk' — popping the panel reveals all manner of decidedly non-ST electrical equipment, including a Classic Retrofit fuseboard, an electric air-conditioning system from the same firm and evidence of a two-stage electric heating system, all housed in an incredibly tight space alongside Bosch twin high-flow fuel pumps, a swirl pot, the heart of a Lifeline fire safety system, a full-size Yuasa YBX-series battery, the fuel tank, fluid transfer hoses, airflow pipework and an RSR strut brace. "Packaging was a challenge," David smiles. "The owner was adamant his car should carry a full-size spare wheel. We've managed to achieve a tidy installation, but it wasn't straightforward."

MAKE THE SWITCH

It's a similar story in the cabin — a Workshop Seventy7 one-piece knee pad needed to be modified to work around the roll cage, as did the manual window winders and the leather-edged square-weave carpet. The D'eser vintage buckets took a little while to position correctly, too, but now sit pretty on Cobra mounting plates and hold their occupants firmly in place with Schroth safety harnesses. As you can see, a 914/6 four-spoke steering wheel trimmed by Royal Steering Wheels takes centre stage, though the more you look, the more you spot custom touches. The notched wooden gear knob is, of course, fairly obvious, but eyeball the dash (matching the interior door handles and long door pulls in being trimmed in leather and featuring weave inserts) and, below the 10k rev counter, you'll find additional switches. "They're for the heated front windscreen, air-conditioning and a BS Motorsport fuel prime system designed to feed petrol straight into the engine for hassle-free starting. Additionally, there's a duo of pull switches, one for each of two electronic ignition control units," David reveals. "USB power, cut-off switches for the electrical systems

Above ST evocations are arguably more popular than Carrera RS 2.7 replicas right now, and judging by this Oshe build, it's easy to see why

Below Workshop Seventy7 worked wonders packaging a huge amount of aftermarket equipment into the car's tight luggage area

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GLM 7J

Above It's hard to believe this motorsport-inspired 911 rolled off the Porsche production line as an entry-level model fifty years ago

and nozzles for the fire extinguisher also feature, as does a JL Audio MBT-RX Bluetooth receiver linked to a hidden Focal amplifier and Morel door speakers. There's even an under-seat subwoofer in there! It was difficult trying to squeeze all this modern technology into the car whilst maintaining period looks, but I'm pleased with the job we did and, more importantly, the car's owner is thrilled with the end result."

He's also happy with the exterior details he asked David to introduce to the build. The 911 R rear light clusters are a standout feature here, as are the slots in the front bumper. "They're not cut into the panel," David explains. "Rather, they're laser-cut into steel inserts welded into metal 911 S bumpers replacing the fibreglass parts previously in place when the car was evaluated for its FIA passport. The right-hand slots channel air to the oil cooler, while the left-hand slots send cool air through ducting to the air-conditioning condenser." The theme continues at the rear, with bumper slots visible above the moody black tailpipes and below the FIA rain light, which hints at the split personality of this awesome orange 911 to anyone following close behind.

THE 911 R REAR LIGHT CLUSTERS ARE A STANDOUT FEATURE, AS ARE THE SLOTS IN THE FRONT BUMPER

And what of the drive? Following chassis tuning at Center Gravity and a raised rear ride height to accommodate bigger rims — a set of nine-inch-wide modern Minilites replace the original eight-inch magnesium wheels, though the seven-inch front Fuchs remain, all wrapped in fat Michelin black circles — the seventh Oshe build handles like a dream, sticking to the road like glue. "It pulls and pulls," David beams. "The noise and power from the fettled flat-six is fantastic. It's obvious this car would be great for hill climbing, but equally, it's a 911 you can comfortably use to cruise around town at low speed. The civility our customer wanted to marry with the option of raucous racing potential works well, though there's obviously now a huge amount of work to do if he decided to return to the specification Jürgen Barth endorsed. Even with all the mod-cons on board and softening of its motorsport credentials, however, this is still a fairly hard car for the road, requiring huge involvement from the driver."

Regardless of the environment it finds itself being driven in, following the factory ST blueprint, this pumpkin-painted Porsche is a superb example of a reimagined base-model 911 fixed up for racing, but remaining road legal. Benefiting from tried and tested motorsport mechanicals, but offering its proud pilot enough compliance to provide comfort for long periods of road use, it follows the Workshop Seventy7 ethos of giving function and form equal billing, one aspect not outshining the other.

Admittedly, straying from its FIA-stamped state of dress, there's in-car entertainment and electrical equipment here entirely supplementary to requirements for a true-to-ST race car, but as a jack of all trades (we mean this in the nicest possible way) and now more evocation than replica, this gorgeous 911 is a wonderful example of an air-cooled classic given a new lease of life at the hands of truly passionate Porschephiles. We can't wait for the eleventh Oshe build — we're sure it will be just as satisfying as seventh heaven. **CP**

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LIVEWIRE

Our look at what's happening in the wonderful world of air-cooled classics…

PORSCHE MOTORSPORT ENGINEERING WIZARD, VALENTIN SCHÄFFER, CELEBRATES NINETIETH BIRTHDAY

Genius engineer, Valentin Schäffer, responsible for numerous racing engines at Porsche, has always distinguished himself with his diligence and ambition. Coinciding with the ninetieth anniversary of Porsche Engineering services, the Hungarian-born motorsport man has just celebrated his own ninetieth trip around the sun.

Schäffer began his career at Porsche as a mechanic in 1955. "I wanted to attend the school of engineering in Stockach, but I fell in love and my relationship brought me to Tamm, near Ludwigsburg," he told us. "The team at Porsche gave me a very warm welcome. I was able to start work in the racing department the very day after my job interview." Shortly after joining the company, he found himself working on the Type 547/2 engine for the 550 Spyder. As he proved himself to be not only hard-working but also very capable, the company appointed him head of its race engine development programme in 1966. His boss, Ferdinand Piëch, headed the entire motorsport development department from 1965 onwards, and paired Schäffer with fellow engineering wizard, Hans Mezger. It would prove to be a fruitful working relationship.

Over the course of more than thirty years, many Porsche engines were created with Schäffer's input. Early high points in his career included development of the Type 753 and Type 771 flat-eights, which brought Porsche victories in Formula One, in the FIA European Hill Climb Championship and in the World Sportscar Championship. "The eight-cylinder 771 was my absolute favourite engine," he recalls. "It was the best Porsche engine for hill climbing. I worked on this unit every day for a very long time and tinkered around with the exhaust system to get a bit more horsepower. Even when I was away from the office on holiday, I was always thinking about work and looked forward to getting back to Porsche and progressing the company's motorsport efforts."

Schäffer supervised numerous unforgettable racing events between 1956 and the end of 1980. His work sent him all across the globe and

he witnessed many famous races, including those in the Can-Am series, the Targa Florio and, of course, at Le Mans. He was also present on June 14th 1970, when Porsche claimed its first overall victory at Sarthe — Hans Herrmann and Richard Attwood took the win at the wheel of the Salzburg-liveried 917 short-tail. Schäffer also had a hand in development of the successful six-cylinder engines for the 906 and 910, as well as the six-cylinder Type 916 (which served as a basis for the 908) and in testing the deceivingly named Type 912 flat-twelve destined for the 917.

The flat-twelve is one of the landmark projects in Schäffer's career, and indeed in Porsche's engineering story. The turbocharged versions of the 917, however, posed a challenge. "In 1971, I completely reassessed the turbo engine, which earned me the nickname Turbo Valentin at work," he laughs. "Even though many exalt the 917's beating heart today, it is, in fact, a very simple engine," he says, modestly, before smiling and reminding us how the 912/52 turbo engine used in the 917/30 Spyder set a new world speed record at Talladega Superspeedway in August 1975, when Mark Donohue achieved an average speed of 221.07mph on the 1.65-mile oval.

Schäffer's time with Porsche saw him involved in the development and construction of the aforementioned Type 547/2 flat-four for the 550 Spyder in 1956, the eight-cylinder Type 753 for the 804 Monoposto in 1962, the eight-cylinder Type 771 for the 718, 904, 906, 910, 907 and 909, the six-cylinder Type 901/20 for the 906 in 1966, the Type 901/21 for the 907 and 910 the same year, the eight-cylinder Type 908 for the 908 in 1968, the twelve-cylinder Type 912 for the 917 in 1969, the Type 912/51 for the 917/10 in 1972, the Type 912/52 for the 917/30 in 1973 and the six-cylinder Type 911/78 for the 908/03 Spyder Turbo in 1975. He retired in 1989, but remained so closely associated with Porsche, he continued to serve the company for another five years. Many happy returns, Turbo Valentin!

BURKE AND SAUNDERS DOUBLE UP ON DRAMATIC 911 CHALLENGE RSR WINS

David Burke's 911 RSR was the car to beat in the TracTive Suspension Porsche Club Motorsport 911 Challenge races at Brands Hatch on September 5th, winning the opening race in the owner's hands and the second race of the day with the experienced Brian Saunders on board.

The RSR had been pushed hard in qualifying by the potent 911 SC of Tim Bates, less than half a second separating them at the end of the session, with James Neal third in his 964 Carrera 2 and the 911 RSR of Rainer Becker in fourth place. The 964 RS N/GT of Nathan Luckey and David Harrison had engine issues in qualifying, but ended up splitting the father and son duo of Roger and Morgan Sparrow on the grid.

Unfortunately, Bates was forced to withdraw after qualifying, which moved Neal onto the front row of the grid for the first of the two 25-minute races. His car was moving in its grid box just as the race started, and although he got away well and led the pack, the regrettable incident was to haunt him later. Another driver quick off the mark was Christian Ayres from fifth on the grid, slotting into third by the end of lap one, ahead of Becker and Luckey, the latter's 964 now back on song.

On the second lap, the message came from Race Control that Neal had been given a ten second time penalty for a False Start, which meant the closely following Burke didn't have to pressure for a way past — he could just stay with the leader and take the win. This is what he did for much of the race, but when Neal lost time passing a backmarker, Burke seized the opportunity to move the yellow RSR ahead. Neal immediately retaliated and the cars were side-by-side down the hill for the first corner. Surprisingly, Neal span to halt, before re-joining, managing to maintain second place. The cars finished in this order, Neal far enough clear of third place to retain second in the results, even with a time penalty.

"It's my first ever race win," said a delighted Burke. "I'm still amazed I managed to get past Neal. I was behind him for more than twenty laps! It was unfortunate that he spun, but he kept on going and a win is a win." Neal was equally contemplative. "I was able to hold Burke off for quite a few laps," he said. "I was quicker down the straight, but then I got baulked by a backmarker and Burke got past. We were together down Paddock Hill, but I spun."

The battle for third had been an intriguing one, Luckey slowly closing on Becker lap by lap for much of the race, before finally going past in Clearways with three laps to go. Becker finished fourth ahead of Ayres, Roger Sparrow claiming family honours after Morgan retired from the race. The second race of the day saw a dominant display by Saunders (now in the RSR taken to the race one win by Burke), who led all the way and pulled away from the pack with a series of remarkably consistent lap times. He eased his pace in the latter laps and Neal was able to reduce the deficit, but he was also working to stay out of the clutches of David Harrison, now racing the 964 RS N/GT driven by Luckey earlier.

Saunders took the win, Neal ten seconds back, but crucially over a second clear of Harrison, having ensured the red 964 was never close enough to mount a challenge. Becker claimed his second fourth place finish of the day with his near original RSR. Ayres again finished fifth.

"First and foremost, I was happy to bring the car home," said Saunders."It's always a big responsibility to drive someone else's Porsche. I wanted to get away well at the start, get a lead, and then just preserve the car. I really enjoyed the race and I've never stood on the Brands Hatch podium before. I rather liked the experience!"

"I was having to stay just clear of Harrison, but I was having fun playing with the gap," said Neal. "He drove very well and closed in after a while, but I could control how close he got and I'm happy with two second place finishes." The fastest laps of the day went to Burke, scoring 54.451s with an average of 79.96mph in race one, and Saunders in the same car, registering 54.785s with an average speed of 79.37mph.

BAUHAUS MEETS CLASSIC PORSCHE CULTURE AT WELTAUSSTELLUNG 2021

Back in 2015, when Tom Gädtke (known by his social media handle *@onassisporsches*), brought together eighteen fellow enthusiasts at a car park in the Ruhr district of Germany, nobody expected the gathering to develop into one of the most unique Porsche events in Europe, but that's exactly what happened over the course of the following five years.

Since 2015, Gädtke's annual *Streetart.Motorsport.Rev* event has been labelled with different themes, including Tunnelrun, Triangle of Madness, 800 and, in 2020, Airtimes. This year's meeting of Porsche fans was themed around the Bauhaus architectural style. Given the tagline Weltausstellung (World Fair), the event was inspired by the German Pavilion featured at the 1929 International Expo held in Barcelona. Built using exotic materials, including marble, red onyx and travertine, the minimalist building has inspired the work of many famous architects and is considered a ground-breaking feat of architectural design.

Gädtke's team adopted the aesthetic of Bauhaus to create the look of their *Streetart.Motorsport.Rev* event, held at the only industrial complex ever to be designed by Ludwig Mies van der Rohe, an award-winning German-American architect regarded as one of the pioneers of modernist architecture and co-designer of the German Pavilion, for which he was offered the contract to design and build in 1928 after his successful management of the *Deutscher Werkbund* exhibition held in Stuttgart a year earlier. Essentially, it was a celebration of the period's German artists, architects, designers, and industrialists. The success of the event contributed to Mies van der Rohe becoming director of the ground-breaking school of modern art, design and architecture known as Bauhaus, but after Hitler's rise to power and the Nazi party's strong opposition to modernism (leading to the closing of the Bauhaus itself) in the 1930s, Mies van der Rohe emigrated to the United States, accepting an invitation to head the architecture school at the Armour Institute of Technology in Chicago.

The building captivating Gädtke's imagination was built in Krefeld in 1931. The extraordinary set-up of this historic facility is one of the most interesting things about it: large sections of the complex's main hall have been painstakingly restored to their original condition, while the adjacent industrial hall looks more like an abandoned ruin. As far as the *Streetart.Motorsport.Rev* team was concerned, this special building offered the ideal setting for their Bauhaus-themed event.

In the grounds outside, Porsche enthusiasts set the stage with a display of unique vehicles, including many air-cooled 911s. Meanwhile, inside, Gädtke worked with Porsche Classic to create an innovative, artistic world which tied everything together: the exhibition included a 1975 911 Turbo (930) body shell currently in the process of being restored, plus a fascinating collection of cars lifted out of the vault of the Porsche Museum in Stuttgart. Visitors could admire some of the most famous, iconic off-road Porsche vehicles ever built — among the treasures on display were a Paris-Dakar 959, a 911 SC Safari, a 953 (the four-wheel drive 911-based model built for the 1984 Paris-Dakar rally) and two first-generation Cayennes loaded with Style Porsche vinyl wraps and various Porsche Exclusive Manufaktur accessories. A pair of Taycan Cross Turismos flew the flag for truly modern Porsches.

With moody lighting and wall-hanging works of art to mesmerise attendees, the atmosphere was super-relaxed — more than five hundred fans spent the afternoon wandering through the grounds outside the main building and chatting with fellow enthusiasts about the cars on display, before making their way through the halls inside, admiring all of the historically important Porsches gathered for the event. As far as the newer (so new they're all-electric) models are concerned, the crowd was invited to take advantage of test drives in and around Krefeld, putting the adventure oriented Taycans through their paces. Same time next year?!

1986 CARRERA 3.2 RESTOMOD SET TO LIGHT UP HISTORICS WINTER SALE

Regular readers will recall last month's news round-up, when we highlighted the 1979 911 Turbo (930) converted by RUF Automobile to BTR specification and offered at the Historics Auctioneers sale at Ascot Racecourse not long after the magazine went to print. The white wonder went on to sell for £91,692, far more than the published lower estimate. Interested parties who missed out on the chance to buy the car need not fret — Historics has consigned another eye-popping 911 to its roster! This air-cooled classic will go under the hammer at the firm's Winter sale, slated for the 27th November and to be hosted at Mercedes-Benz World in Weybridge. Taking the form of a Carrera 3.2 restomod, the car was originally supplied to a Japanese Porsche customer in 1986, before being imported to the UK. It was purchased by the vendor back in 2011.

The specification of this car is nothing short of fantastic. The body was bare-shell dipped, strengthened and painted, features hand-rolled RSR-inspired wide wheel arches, a bespoke composite front bumper and splitter, an RSR rear bumper and a dash-controlled 964 deck lid, while the interior is generously trimmed in Alcantara and one-off custom houndstooth fabric. Twin stitching features throughout, not least on the remodelled dashboard, door panels and rear quarter cards.

The back seats have been converted and boxed to housed a JL subwoofer and an MSD spark box, while the clocks are all new and colour coded. The steering wheel is double-wrapped in leather, and the same attention to detail has been lavished on the engine bay, which benefits from colour-coded accessories and mounts. The engine itself is based on the 3.2-litre flat-six and has been fully rebuilt by Porsche engine specialist, Wrightune, with machine work carried out by Redtek and dyno testing completed by BS Motorsport to the tune of 230.4bhp and 223.4 lb-ft torque. The boisterous boxer carries 964 camshafts, PMO 46IDA carburettors with K&N filters and hats, MSD ignition, a BK Racing distributor and an M&K GT3-style muffler with minimal baffle, though a block-off butterfly valve can be activated in the right-hand tip by way of a control switch in the cabin.

Straight-through electrically heated headers and braided oil lines are part of the package, as is a 915 gearbox fully rebuilt and making use of a Wevo short shifter and linkage. Clubsport engine and transmission mounts, as well as Clubsport top mounts and bushes, have been adopted, as have HID headlights, electric air-conditioning, a modern fusebox, Bilstein heavy duty dampers and inserts, a bespoke strut brace, Elephant Racing hollow adjustable anti-roll bars, thicker torsion bars, all new wheel bearings and a totally rebuilt steering rack.

Bringing the car to a swift halt is a Rebel Racing big brake kit comprising 318mm rotors slotted into 996-generation 911 calipers paired with a 930 master cylinder. Though colour-coded to match

the body, these awesome anchors are barely visible, hidden as they are behind Zuffenhaus USA three-piece seventeen-inch Fuchs-style staggered rims wrapped in Toyo Proxes R1R rubber. As you'd expect, all work is documented and supported by paperwork and a photo album showcasing every step of the build, from bare metal to the finished 911. There's a leather bag finished in the one-off houndstooth, too.

The personal project of an award-winning UK-based classic vehicle restorer, this cool Carrera 3.2 is listed with a lower estimate of £140k. For further information and to register for bidding, visit the Historics Auctioneers website at *historics.co.uk* without delay.

PRODUCTS

With Christmas just around the corner, here are exciting gift ideas for you, your Porsche-loving friends and, of course, your air-cooled classic…

JENVEY DYNAMICS IDA3 HERITAGE THROTTLE BODY KITS FOR CLASSIC 911

Jenvey Dynamics, the world's leading developer and manufacturer of fuel injection throttle body and induction systems, has announced a brand-new product guaranteed to excite air-cooled 911 owners and enthusiasts, as well as professional classic Porsche tuners and restorers. Completely designed and manufactured in-house at the company's Shropshire headquarters, these new Jenvey IDA3 Heritage throttle body kits are a natural progression from the firm's exceptionally successful DCOE Heritage throttle bodies released in 2017. Boasting all the plus points associated with Individual Throttle Bodies (ITB), the Heritage line-up maintains the understated looks of a period carburettor induction set-up, ensuring the kit won't appear out of place in the engine bays of a classic Porsche.

The level of finish exhibited by the IDA3 Heritage throttle body is a direct result of the intensive development period prior to bringing the product to market, efforts which saw Jenvey collaborate with Rothsport Road and Race, one of the USA's leading Porsche engine tuning specialists. This relationship saw the throttle body extensively road and dyno tested on Rothsport's own development 911, with the resulting data ploughed right back into the project. Further development in the UK confirmed fantastic performance and drivability gains. The end result is a throttle body which looks perfectly at home when bolted to the top of an air-cooled flat-six, yet manages to function in a manner previously reserved for more modern induction systems. Indeed, Jenvey's attention to detail is evident in every aspect of the IDA3 Heritage throttle body design, with the completely hidden fuel injectors and throttle pot being prime examples of how the company's engineers remained sympathetic to OEM Porsche looks throughout the development process.

The new Jenvey kit is proven to provide notable increases in power across the rev range, offers improved fuel economy, less laboured starting and, of course, it sounds simply amazing. The company has made sure to offer its IDA3 Heritage throttle body kits for the two-bolt flat-six with 35mm (two-litre to three-litre engines) and 39mm (Carrera 3.2) port sizes married to a 42mm and 45mm throttle body respectively. The smaller throttle bodies use 250cc Bosch injectors, whilst the 45mm throttle bodies use a 350cc Bosch injector. 60mm long airhorns are available with a bolt pattern matching the original. A three-bolt kit with a 41mm port size for the 964 is in development, utilising 45mm bodies and a cross linkage clearing the standard fan shroud.

Kits include manifold with heat insulators, IDA3 Heritage throttle bodies, electronic fuel injectors, integrated fuel rail, cross bank floating linkage (to allow for engine expansion), throttle position sensor and airhorns. Various filtration options are available to suit each application.

Jenvey leads the market with its innovative designs, always striving to push the boundaries of induction systems, so is this new Heritage throttle body kit not something of a sideways step for the firm? "While superior to carburettors in every quantifiable way, many classic 911 owners have been dissuaded from adopting throttle bodies due to an unwillingness to compromise the OEM aesthetic of their treasured Porsche's engine bay," says Jenvey's Managing Director, Mike Jenvey. "With the increase in popularity of the classic Porsche market and heightened demand for the benefits of an electronic fuel injected intake system, however, our IDA3 Heritage throttle body design addresses improved performance with satisfyingly OEM visuals".

Jenvey's Porsche IDA3 Heritage throttle body kits will be officially launched at the NEC Classic Car Show in Birmingham this November, with pre-orders now being taken for mid-November deliveries. For further information, visit the Jenvey Dynamics website.

Price: £4,129

***jenvey.co.uk* or call 01746 768810**

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PORSCHE CLUB GB 356 ‘ROBIN HOOD’ MODEL

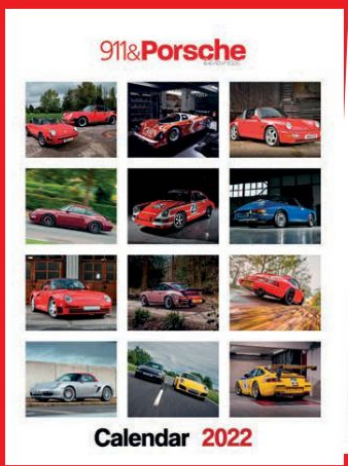
In September 1961, Porsche Club Great Britain was founded by a small group of like-minded enthusiasts to enjoy and celebrate the 356 — the only Porsche production model at the time. Wind the clock forward sixty years to the present day and the club boasts a massive 25,000 members and, happily, is in possession of its very own 356, restored to a high standard and often displayed at club events. A Heron Grey 1960 T5 B known affectionately as the Robin Hood 356 (in recognition of the stage name adopted by its first and only other owner, a London-based magician), the dinky Porsche has now been immortalised in the form of a limited edition model manufactured by Spark. Exclusively offered through the club’s website and presented on a uniquely numbered plinth, the small-scale Porsche can be ordered as one of six hundred 1:43 models or as one of just sixty 1:18 variants. Once sold out, no further examples will be made, so act fast and order online today.

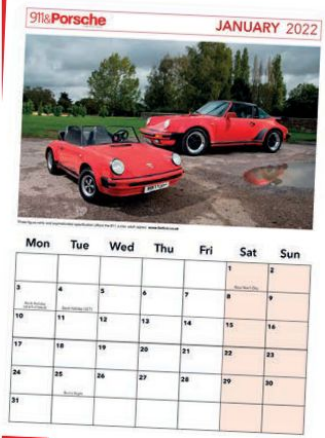
Price: £50 for 1:43, £150 for 1:18
***porscheclubgb.com* or call 01608 652911**

2022 PORSCHE CALENDAR

Featuring stunning images lifted from the pages of *Classic Porsche* and its sister title, *911 & Porsche World*, this A3-sized wall-hanging calendar proudly displays cars as diverse as a 911 Junior, a 959 and RLR 962-200, one of the most historically significant Group C prototypes to ever wear the Porsche crest. Each day is represented with enough space for you to make notes — perhaps listing key enthusiast events, vehicle maintenance schedules or your car’s annual date with an MOT tester?! Displaying stunning photography throughout, this superb calendar is a must for any Porsche fan and is offered with free delivery to all UK addresses. Low-cost overseas shipping is also offered at the point of purchase from the Kelsey Publishing online store.

Price: £8.99
shop.kelsey.co.uk/911CAL
or call 01959 543747





MAXILITE 15-INCH ‘BABY FUCHS’ FOR 914

Since wheel manufacturer, Maxilite, was established in Switzerland back in 2008, the company has gone from strength to strength, offering new rim designs for German, Italian, French and Japanese sports cars on an almost monthly basis. None of its product ranges have proved as popular as those catering for classic Porsches, however, be they rims for air-cooled cars or Stuttgart’s transaxle family of front-engined, water-cooled models. In time for Christmas, Maxilite has announced the launch of an addition to its line of replica Fuchs wheels with the fifteen-inch ‘Baby Fuchs’. Designed to work with the host Porsche’s original lug nuts and available with a width of 5.5 inches, this TUV-certified four-spoke comes complete with centre cap and black powdercoating, finished with a diamond-cut face. Each wheel features a PCD of 4x130mm, ET35 offset, a centre-bore of 78.8mm and is shipped from either Maxilite’s fully stocked German warehouse (packed with more than fifteen thousand wheels) or its Florida-based distribution centre. Visit the company’s website to view its full range of wheels for classic Porsche sports cars.

Price per wheel: €245/$210
***maxilite.ch* (Europe) or *maxilite-wheels.com* (USA)**

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CARBONE CUSTOM DOOR CARDS FOR CLASSIC 911

With influence taken from the legendary 911 R and 911 ST racing models, classic Porsche styling and accessories specialist, CarBone, has launched a range of custom door cards for air-cooled 911s. The set contains everything you need to mount a fresh set of door cards: left and right panels, door opening straps, brackets, bolts and washers. Ideal for those looking to personalise their Porsche this Christmas, each pair of door cards is available with material and stitching to suit your needs. Choose houndstooth, Alcantara, tartan or from a selection of various leathers in a variety of colours. Simply specify whether you're buying for a right-hand drive or left-hand drive vehicle, whether you require speaker apertures, door lock holes, electric or manual window winders, whether you want door card pockets and what your preferred strap colour is. CarBone has even published a helpful video showing you how to install the door cards. Allow two to three weeks for each bespoke order to be made.

Price: €600-750

***car-bone.pl* or call +48 429 422 115**

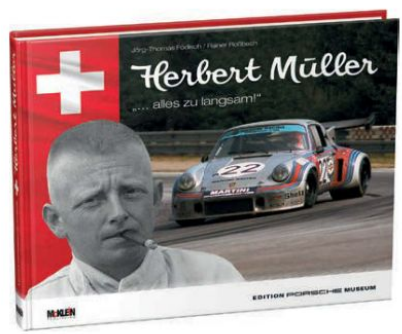
STUTTGART CLASSICA ALUMINIUM ENGINE LID HINGES

Manufactured from high-quality 5mm-thick aluminium, featuring laser-cut holes to reduce weight and polished to improve aesthetics, these engine lid hinges from classic Porsche accessories and restoration specialist, Stuttgart Classica, are offered in pairs and come supplied with all the necessary hinge bolts. Weighing a mere 0.7kg, hinges are available for all classic 911s, 964s and 993s, with special versions available for 964s wearing an early engine lid, and even early cars wearing a 964 engine lid. Tried and tested on the custom 911s owned by Stuttgart Classica founders, Will Chappell and Jase Eaton, each pair of hinges is available to order direct from the company's online store with free UK shipping (worldwide shipping attracts an additional £30). Visit the website to place your order and to see Stuttgart Classica's full range of body, interior, electrical, chassis and engine upgrades, as well as novelty Porsche-themed gift ideas.

Price: Special offer £449 (usually £495)

***stuttgart-classica.co.uk* or call 01386 701437**

HERBERT MÜLLER *"...ALLES ZU LANGSAM!"* BIOGRAPHY



One of the great all-rounders: twice winner of the Targa Florio, twice European hill-climb champion, thirteen-time Le Mans participant, two second-place overall finishes at Sarthe... the list goes on. Swiss racing driver, Herbert Müller, who referred to himself a "professional amateur", drove almost everything fast and good in his more than twenty-year motorsport career. From motorbikes to a stint in F1, he successfully tried his hand at seemingly every motorsport machine. Most of all, however, he loved driving Porsche sports cars.

McKlein, the specialist publisher of automotive books, now brings Müller's racing career and his personal story into print. Covering the full range of his skills and the colourful mix of cars he drove, this beautiful book documents the life and times of a popular racer who sadly met his end behind the wheel of a 908 at the Nürburgring in 1981. Now, on the fortieth anniversary of his passing, authors, Jörg-Thomas Födisch and Rainer Roßbach, recall the unprecedented career of the cigar-smoking jack-of-all-trades in all cockpits.

In 1966, Müller scored a sensational victory in the world-famous Targa Florio in Sicily, driving a 906. We highlight this remarkable achievement later in this issue of *Classic Porsche*. Indeed, fans remember 'Herbie' and his successes far beyond the borders of his home country. Memories of family members and many contemporary witnesses enrich this comprehensive biography of a motorsport competitor who rose to the top on merit. Featuring many photographs and Porsche factory documents never been seen before in public, this gorgeously presented 30x24cm hardcover a must-have tome for any fan of historic sports cars and Porsche racing.

Price: €79 (German language version)

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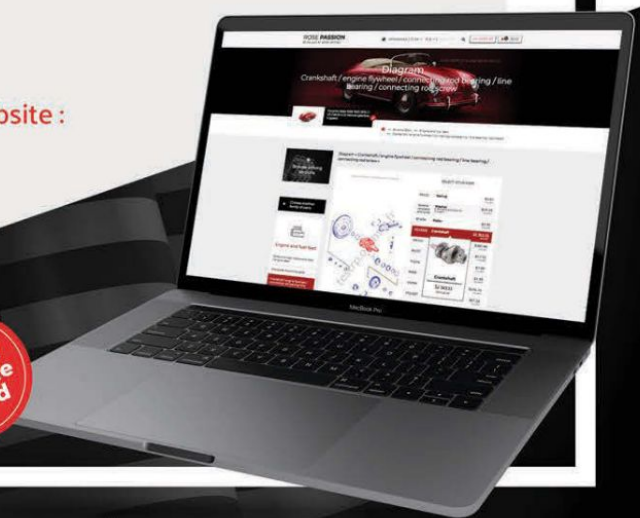

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Offering 1,050lb-ft operating torque to tackle the toughest of applications and 1,440lb-ft torque to provide additional power making short work of the most stubborn fasteners, the CTU9080 18-volt half-inch-drive brushless cordless impact wrench kit from leading tool manufacturer, Snap-on, is new to market in time for Christmas. The unit’s nose cone features a premium abrasion resistant finish to help keep the tool looking showroom new, while a digital microprocessor-controlled switch maximises performance, run time and durability. Three forward torque settings and another three for reverse enable you to easily adapt the CTU9080 to various applications, and a built-in brake prevents the tool from throwing fasteners and sockets. Lightweight for ease of use and equipped with a super-bright LED to illuminate your work area, this brilliant impact wrench is supplied with two batteries and a charger. Speak to your local franchisee to get the best Snap-on seasonal deal.

Price: POA

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DAVE THE TRIMMER CUSTOM DOOR CARD HANDLES FOR G-SERIES 911 & 964

As you’ll see later in this issue of *Classic Porsche*, Dave Goodwin, founder of UK-based automotive interior specialist, Dave the Trimmer, recently customised the interior of his newly acquired 964 Carrera 2. In doing so, he reimagined the car’s factory door card handles by creating bespoke CAD drawings and then machining each handle out of a solid piece of billet aluminium. The material was chosen to prevent the ‘bin lid’ warping over time. Lightweight and featuring machined cut-outs (six, in recognition of the number of cylinders at the rear), these unique cabin enhancements can be anodised in a choice of colours to suit the interior of your G-series 911 or 964, or they can be painted to any colour or finish. Additionally, the door pull release can be solid or is offered with the option of a Dave the Trimmer logo for those who want to pay tribute to the company’s work.

Price: £1,600

***davethetrimmer.com* or call 01908 565039**

BERGVILL F/X T-LIGHT HEADLAMP UPGRADE FOR 993

Aftermarket automotive electronics producer, Bergvill F/X, has added to its portfolio of products for Porsche models by introducing a new T-Light headlight upgrade kit for the 993-generation 911. The company has enjoyed many years of international success with the original T-Light kit, which is a plug and play HID upgrade, replacing the 993’s standard halogen low-beam headlights without the need for changing optics or other components, save for the original bulbs. In 2020, Bergvill F/X launched an upgrade for its 993 low-beam offering, optimising output beam and light pattern, as well as offering a 6000K variant (over the standard 4300K version) for drivers who like whiter light. Fast-forward to today, and the company has added to the range with an upgrade for the 993’s high-beam headlamp lighting. Based around LED architecture, the kit is the perfect companion to the low-beam package and boasts brightness three times stronger than the stock halogen bulbs — a huge improvement over the 993’s otherwise dim headlights and perfect for the model’s open reflector design. For those who want the full monty, Bergvill F/X’s low and high-beam 993 headlight kits can be ordered as a bundle, attracting a discount when ordered direct through the firm’s online store.

Price: Low-beam kit €124, high-beam kit €129, full package €228

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CHRIS WRIGHT

Porsche Engineering has offered consultancy services to many different car makers since Ferdinand Porsche opened his design offices nine decades ago, and though we rightly celebrate the wide body of work the company bearing his name has delivered over the years, Porsche's own engines are pure engineering excellence...

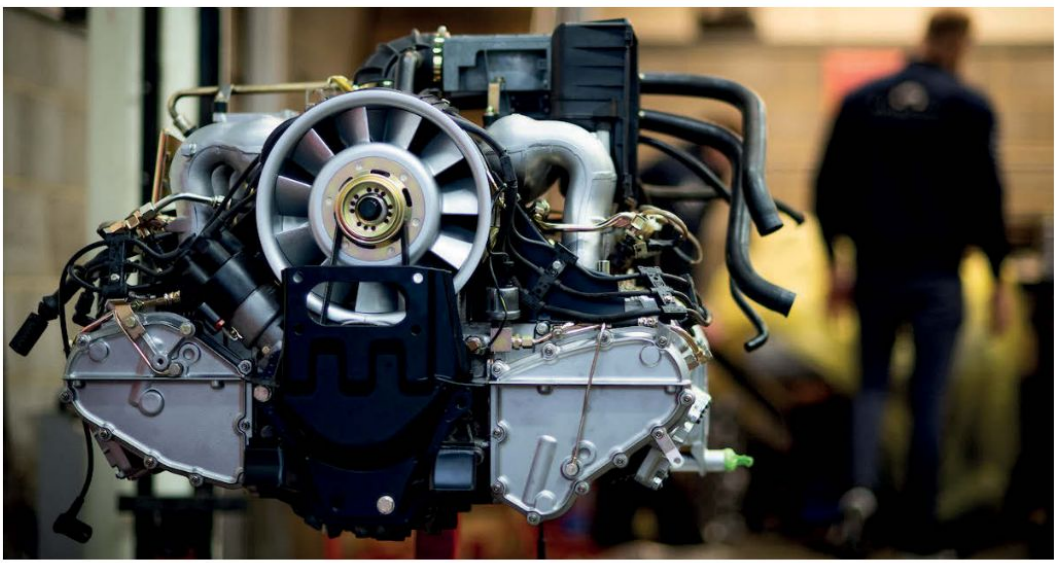
Chris Wright joined his father's business to help with the day-to-day running before recently taking the helm. A dedicated team of four, Wrightune carries out Porsche servicing, maintenance, engine and gearbox rebuilds. **Visit** ***wrightune.co.uk***

Porsche engineering is among the best in the world. Indeed, one of the things I love about Porsche is the relative simplicity of its engine engineering and the high-quality components used. On a standard flat-six rebuild, you can expect to retain up to ninety percent of the original parts, even after forty-plus years of action. Usually, when rebuilding a Porsche engine, only standard rebuild parts are required — the metals and materials used at the point of manufacture are of premium quality. The crankshafts, for example, are very durable and can typically just be polished after being checked. The connecting rods are almost aways reusable after some resizing, and the cylinder heads are often serviceable.

These engines lend themselves to all manner of possible modification possibilities. They're extremely reliable, of course, which is one of the reasons Porsche has been so successful in motorsport, and, largely due to the unique design and position of a 911 engine, the way these cars sound and drive is like no other.

The design of the 911 is truly beautiful and is instantly recognisable thanks to the manufacturer's designers retaining DNA true to Ferdinand 'Butzi' Porsche's original 911 concept. To quote a Kinetic Sculptor by the name of Theo Jansen, "the difference between art and engineering exists only in our minds". To me, the Porsche marque represents perfect design fused within engineering excellence — form and function.

Why do I think Porsche is better than any other marque? I'll admit to being somewhat biased, having only ever worked on Porsche cars. Being brought into the fold through Wrightune, the Porsche repair business founded by my father, Tony Wright, many years ago, I simply trusted his opinion and engineering skills. With this in mind, who better for me to ask when attempting to ascertain what attracted so many seasoned professionals to the Porsche in the first place? "When I started working on Porsches, following years rebuilding Ford Cosworth DFV F1 V8s (which were the most used engines in the sport), the quality of the components was of the highest quality," he told me. "The premium standards which Porsche engines and transmissions were manufactured to made them a pleasure to work with. Additionally, Porsche powerplants were made to a very high tolerance and with a very low wear rate. These units were superior in every way to the output of other manufacturers, which included all high-end marques in the 1970s." Even in today's world of modern technology, it's difficult to argue against Porsche's air-cooled boxers being fantastically engineered. Here's to you, Ferdinand!



THE PORSCHE MARQUE REPRESENTS PERFECT DESIGN FUSED WITHIN ENGINEERING EXCELLENCE

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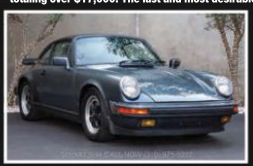
1998 Porsche 993 C4S Coupe stock #14193

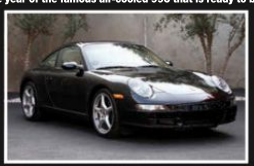
This amazing and low mileage 1998 Porsche 993 C4S Coupe featured with 48,541 miles on the odometer is available in its factory color code #741 black with a black interior. The vehicle comes equipped with a 6-speed manual transmission, Flat 6 Cylinder 3.6-liter engine, engine sound package, automatic speed control, 8-way electrical seat (left), pleated leather front seats, CD-radio Becker Porsche CDR-210 USA, air conditioning, power mirrors, power windows, aluminum shift knob, aluminum parking brake lever, power steering, sunroof, Alu-look instrument dials with chromed rings, 4-wheel disc brakes, Porsche Twist wheels, jack, and spare tire. Both the color code and options sticker are still in place under the hood. Also included are service documents and receipts dating from 2010 to 2019 totaling over $17,000. The last and most desirable year of the famous air-cooled 993 that is ready to be driven and enjoyed. A well-equipped sports car that is mechanically sound. For $129,950



1988 Porsche Carrera Coupe #13994

Presenting this pristine special ordered 1988 Porsche Carrera Coupe featured with matching numbers and is available in its (special order) color code #36P Venetian Blue Metallic with a blue interior. The vehicle comes equipped with a 3-speed G50 manual transmission, spoiler (front & rear), automatic speed control, air conditioning, steering wheel with elevated hub, power windows, locking differential, automatic heating control, sunroof, 4-wheel disc brakes, Fuchs wheels, spare tire, tool kit, air compressor, and jack. Both the color code and options sticker are still in place under the hood. Also included with this vehicle are paint meter reading photos as well as service records dating back from 1997 to 2018 documenting the vehicle's history and totaling over $18,000. An excellent and original air-cooled Porsche that is ready to be driven and enjoyed. Do not miss your chance to own such a beautiful sports car that is mechanically sound.

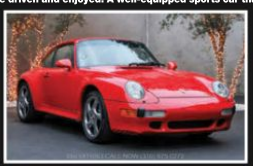
For $108,500



2007 Porsche 911 Carrera Coupe 6-Speed #14258

Presenting this original paint 2007 Porsche 911 Carrera Coupe 6-Speed featured with 86,579 miles on the odometer is available in Basalt Black Metallic with a sand beige interior. The 911 Coupe comes with a clean Carfax and is equipped with a 6-speed manual transmission, Flat 6 Cylinder 3.6-liter engine, automatic speed control, air conditioning, heated front seats, Sport Chrono package, Xenon headlamps, sport shifter, Bose sound package, navigation, power mirrors, power windows, power steering, sunroof, and 4-wheel disc brakes. Also included are paint meter reading photos as well as a copy of the Certificate of Authenticity. An excellent original and well-maintained Porsche Carrera that is mechanically sound.

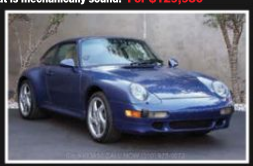
For $46,500



1998 Porsche 993 Carrera S Coupe #14093

Presenting this exciting 1998 Porsche 993 Carrera S Coupe featured with 67,634 miles on the odometer and is available in its factory color code #84A Guards Red with a black interior. The vehicle comes equipped with a 6-speed manual transmission, Flat 6 Cylinder 3.6-liter engine, automatic speed control, air conditioning, power windows, power mirrors, power steering, sunroof, 4-wheel disc brakes, Porsche Twist wheels, and spare tire. Both the color code and options sticker are still in place under the hood. Also includes the original owner's manual as well as service documents and receipts dating back from 2001 to 2011 totaling over $19,000. The last and most desirable year of the famous air-cooled 993 that is ready to be driven and enjoyed. A well-equipped original California car that is mechanically sound.

For $129,950



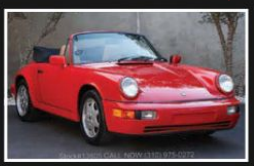
1998 Porsche 993 Carrera S Coupe #13650

Here is an original 1998 Porsche 993 Carrera S Coupe that is available in its (special order) factory color code #L3AX Zenith Blue with a sand beige interior. The vehicle comes with a clean Carfax and is equipped with a 6-speed manual transmission, Flat 6 Cylinder 3.6-liter engine, automatic speed control, sport suspension, engine sound package, LSD Limited Slip Differential with 40% lock, ABD Automatic Braking Differential (Traction control), Board computer, Cassette-radio Becker Porsche CR-210, 6-disc CD changer Becker Porsche CDC-3, air conditioning, sport seats with height electrically adjustable (left & right), leather front seats, power mirrors, power windows, power steering, sunroof, Dark Rootwood shifter, Dark Rootwood parking brake lever, Stainless steel tailpipes (oval), 4-wheel disc brakes, 18" Technology wheels (lightweight hollow spoke), jack, tool kit, and air compressor. Also included are paint meter reading photos as well as receipts totaling over $15,000. An excellent vehicle that is ready to be driven and enjoyed. Do not miss your chance to jump into the ownership of this well-equipped air-cooled sports car that is mechanically sound. For $167,500

1994 Porsche 964 Carrera 4 Wide-Body Coupe #13921

Here is a one-year limited production factory 1994 Porsche 964 Carrera 4 Wide-Body Coupe (1 out of 287 produced) featured with 64,001 miles on the odometer and is available in its factory color code #741 black with a sand beige interior. The vehicle comes equipped with a 5-speed manual transmission, Flat 6 Cylinder 3.6-liter engine, automatic speed control, air conditioning, power windows, power steering, Dark Rootwood shift knob, 8-way electrical seat (left), sunroof, 4-wheel disc brakes, and 5-spoke wheels. Do not miss your chance to jump into the ownership of this highly collectible air-cooled factory wide-body coupe. This well-equipped sports car is also mechanically sound.

For $146,500



1991 Porsche 964 Carrera 2 Cabriolet #13805

Here is a 1991 Porsche 964 Carrera 2 Cabriolet featured with 43,600 miles and is available in its factory color code #90K Guards Red with a sand beige interior. The vehicle comes equipped with a 5-speed manual transmission, Flat 6 Cylinder 3.6-liter engine, automatic speed control, air conditioning, power windows, power steering, soft top, boot, 4-wheel disc brakes, and D90 wheels. A well-equipped and taken care of low mileage 964 Porsche that is mechanically sound.

For $62,500

1998 Porsche 993 Targa #14059

This amazing and well-equipped 1998 Porsche 993 Targa featured with 62,383 miles on the odometer and is available in its factory color code #92U Arctic Silver Metallic with a grey interior. The vehicle comes with a clean Carfax and is equipped with a Tiptronic transmission (4-speed), Tiptronic buttons for steering wheel, Flat 6 Cylinder 3.6-liter engine, automatic speed control, 8-way electrical seat (left & right), pleated leather seats, board computer, power windows, power steering, air conditioning, Stainless steel door entry guards with model logo, and 4-wheel disc brakes. Both the color code and options sticker are still in place under the hood. An extremely desirable and well-taken care of air-cooled 993 that is mechanically sound.

For $76,500

1984 Porsche Carrera Coupe Turbo Look M491 #13956

This rare limited production 1984 Porsche Carrera Coupe Turbo Look M491 featured with matching numbers (Certificate of Authenticity copy included) is available in its factory color code #027 India Red with a sand beige interior. The vehicle comes with a clean Carfax and is equipped with a 5-speed manual transmission, Flat 6 Cylinder 3.2-liter engine, automatic speed control, limited-slip differential, leather sports seats, power windows, sunroof, 4-wheel disc brakes, jack, and Fuchs wheels. A desirable factory Turbo Look Porsche that is mechanically sound.

For $79,950

1983 Porsche 911SC Coupe #14381

Presenting this one owner 1983 Porsche 911SC Coupe featured with matching numbers (Certificate of Authenticity copy included). Available in its factory color code #951 Slate Blue Metallic with a linen interior. The 911SC comes with a clean Carfax and is equipped with a 5-speed manual transmission, Flat 6 Cylinder 3.0-liter engine, air conditioning, power windows, sunroof, 4-wheel disc brakes, Fuchs wheels, jack, and spare tire. Also included is the original owner's manual, warranty/maintenance booklet (service stamps included) as well as service documents and receipts dating back from 1989 to 2020 totaling over $23,000. An amazing color combination air-cooled 911 that is mechanically sound.

For $59,950

1956 Porsche 356A Coupe #13995

Here is a beautiful 1956 Porsche 356A Coupe featured with matching numbers (Certificate of Authenticity copy included). Available in its highly desirable factory color combination of black with a red interior. The vehicle comes equipped with a 4-speed manual transmission, 1600 engine, dual carburetors, matching numbers hood/decklid, beehive tail lights, spare tire, tool kit, and jack. Also included with this vehicle are service records and receipts dating from 2006 to 2016 totaling over $70,000. An excellent original 356A Coupe that is ready to be driven and enjoyed. This extremely sought-after air-cooled Porsche is also mechanically sound.

For $185,000

1964 Porsche 356C Factory Sunroof Coupe #13555

Here is a rare 1964 Porsche 356C Factory Sunroof Coupe featured with matching numbers (Kardex copy included). Available in its factory color code #5407 Signal Red with a black interior. The vehicle comes equipped with a 4-speed manual transmission, 1600c engine, dual carburetors, sunroof, matching numbers hood/decklid, chrome wheels, and 4-wheel disc brakes. An excellent 356C Coupe that is ready to be driven and enjoyed. This extremely sought-after Porsche had the same owner since 2000 and is mechanically sound.

For $119,950

1964 Porsche 356C Cabriolet #11507

The 1964 Porsche 356C Cabriolet featured here with matching numbers (Kardex Included) is available in a gorgeous color combination of Champagne Yellow with a green interior. It comes equipped with a 4-speed manual transmission, dual Weber carburetors, soft top, boot, and solid wheels. An extremely sought-after 356C Cabriolet which had the same owner for many years and is mechanically sound.

For $125,000

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ANDY PRILL

Celebrating ninety years of Porsche Engineering services affords us valuable insight into the thinking and working methods behind the design of the Porsche sports cars we know and love today, but it's important not to lose sight of the many other impressive engineering projects Porsche has been involved with during the past nine decades...

Andy Prill is a qualified mechanical engineer with a love of Porsche stretching back to the restoration of a 912 in the early 1990s. Today, he heads up respected marque specialist, Prill Porsche Classics. Find the company online at ***prillporscheclassics.com***

While war is abhorrent in any form, it does drive engineering innovation. More specifically, long after a war is over, the legacy of technical and engineering development it inspired continues. Proving the point, Germany was on its knees in the wake of the second World War, but the country boasted a large skill base of well-trained and capable engineers. Their influence continues right up to the present day.

When Germany was rebuilding its automotive industry from scratch, established car manufacturers in other countries were producing dated vehicles on machinery and tooling worn from years of manufacturing war supplies (have you ever wondered why so many post-war British engines are full of shims?). Then, during the 1960s, the rest of the world's car makers surrendered to the threat of cheaper, better cars coming from Japan. Many went bust trying to compete. The notable exception were brands in Germany, bolstered by an attitude of refusing to compromise — the country's car makers kept faith and had the courage to believe that though cheap cars may be attractive to many buyers, there would always be a market selling better designed and better engineered automobiles to more discerning customers. Fast-forward to the present, and Germany has the most successful car industry of any country. Porsche is at the forefront, now recognised as the most profitable car manufacturer in the world (on a per unit basis). It's an amazing achievement, especially when you consider that within the growing German automotive industry during the post-war years, Porsche was a fledgling car maker. The company has always taken its own path, however, and though it's true to say there have been many ups and downs along the way, nobody can deny Porsche is a story of success.

The overriding factor in Porsche's good fortune was the balance between the form and function of its vehicles. A key driver of this philosophy was the ability to create cars that were extremely effective and reliable without being overcomplicated. In engineering, this is very difficult to achieve, but when a design is right, it will stand the test of time. For Porsche, this led to evolution (rather than revolution) in engineering and the longevity of its product range. Perhaps the key reason for this prosperity is the simple fact Porsche was founded as an engineering design company in 1931 after Ferdinand Porsche had spent many years managing cutting edge engineering projects for Germany's leading car brands, before realising that while they could survive for years on his work, he could not.

THE OVERRIDING FACTOR IN PORSCHE'S GOOD FORTUNE WAS THE BALANCE BETWEEN FORM AND FUNCTION

As you'll read later in this magazine, the vast variety of his projects encompassing military, aviation, maritime and automotive applications laid the foundations that, in 1948, were funnelled into one objective: building high-performance compact sports cars. Naturally, these cars are what we tend to focus on when thinking about Porsche, but many other inventions and designs have flowed out of the company since 1931. Long may they continue.

911 GT3RS (997)

Orange • Black Nomex Bucket Seats
Porsche Ceramic Composite Brakes
Sport Chrono • 19" Black GT3 Wheels
Porsche Certificate of Authenticity
21,947 miles • 2007 (56)

£149,995

911 Carrera 2 GTS (991)

Carmine Red • Black Leather Sports Seats • PDK Gearbox • 20" Black Centre Lock Wheels • Touchscreen Satellite Navigation • Switchable Sports Exhaust Sport Chrono • 9,870 miles • 2015 (15)

£89,995

Cayman GT4 (981)

Sapphire Blue • Black 918 Bucket Seats
Touchscreen Satellite Navigation
20" GT4 Wheels • Switchable Sports Exhaust • Bi-Xenon Dynamic Cornering Lights • 9,856 miles • 2016 (65)

£75,995

911 Carrera 2 GTS (997)

Basalt Black • Black Half-Leather Bucket Seats • PDK Gearbox • Sport Chrono
19" GTS Centre Lock Wheels
Touchscreen Satellite Navigation
35,182 miles • 2011 (11)

£65,995

911 Carrera 4 S (991)

Carrara White • Black Leather Sports Seats • PDK Gearbox • 20" Carrera Classic Wheels • Sport Chrono
Switchable Sports Exhaust
50,814 miles • 2013 (63)

£64,995

911 Carrera 2 (991)

GT Silver • Black Leather Seats • Manual Gearbox • 19" Carrera III Wheels
Front & Rear Parking Sensors
Previously Sold & Serviced by Paragon
20,127 miles • 2014 (64)

£54,995

Cayman GTS (981)

Carrara White • Black Half-Leather Sports Seats • PDK Gearbox
20" Satin Black Carrera S Wheels
Switchable Sports Exhaust • Sport Chrono • 22,819 miles • 2015 (15)

£54,995

Cayman T (718)

Jet Black Metallic • Black Half-Leather Bucket Seats • PDK Gearbox • 20" Carrera S Wheels • Switchable Sports Exhaust • Sport Chrono • 6,252 miles 2019 (19)

£52,995

Boxster S (718)

Jet Black Metallic • Black Leather Sports Seats • PDK Gearbox • Touchscreen Satellite Navigation • 20" Black Carrera S Wheels • Switchable Sports Exhaust
16,671 miles • 2017 (17)

£52,995

911 Carrera 2 (997 GEN II)

Carrara White • Black Leather Sports Seats • Touchscreen Satellite Navigation
19" Carrera S II Wheels • Heated Seats
Bose Sound System • 18,052 miles
2010 (59)

£50,995

911 Turbo (996)

Basalt Black • Black Soft Ruffled Leather Seats • Tiptronic S Gearbox • 18" Turbo II Wheels • Satellite Navigation • Factory Hardtop • Previously Sold & Serviced by Paragon • 59,273 miles • 2003 (53)

£49,995

Boxster S (718)

Lava Orange • Black Leather Sports Seats • 20" Black Carrera S Wheels
PDK Gearbox • Touchscreen Satellite Navigation • Sport Chrono • Switchable Sports Exhaust • 12,247 miles • 2016 (16)

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90 YEARS ENGINEERING

FRENCH CONNECTION

The first 911s carried factory designation 901, but when Peugeot threatened litigation, the central digit was changed, resulting in the legendary 911 nameplate. We get up close and personal with a true survivor — a Signal Red 901 restored by none other than Alois Ruf Jr…

Words **Johnny Tipler and Dan Furr** Photography **Dan Sherwood**

What's in a name? Or a number, for that matter. Say it often enough, and it becomes part of the vernacular. This is what Peugeot was afraid of when Porsche revealed its 901 prototypes back in 1963. The French auto giant had already annexed three-digit model numbers containing a central zero and, with a litigious threat, persuaded Porsche to think again about using its in-house design number to identify Stuttgart's new sports coupe. Porsche bosses simply shrugged, and changed the zero to a one, giving us 911.

Before Peugeot's umbrage, Porsche had already created eighty-two cars identified as 901. These were among the first run of 235 911s built between September 1963 and January 1965. Ten prototypes were also trialled earlier in 1963. The fact this three-digit name happens to coincide with the USA's emergency telephone number wasn't a concern — 9-1-1 only became the US panic code in 1968. While the wheelbase dimensions of the two-litre 901/911 never varied — 2.20m (87in) — there were several subtle differences between those first cars and subsequent 911s. To start with, as confirmed by Jürgen Barth's *Porsche Book*, 901 chassis numbers are expressed differently from those of later 911 production cars — the first ten prototypes carried chassis identifiers 13321 to 13331/1, as demonstrated by the fifth prototype, built by Karmann in August 1963, carrying chassis number 13325 and presented at the Frankfurt Motor Show a month later. The initial build run — including the eighty-two pre-series 901s — comprised cars stamped 30001 to 300235. Significantly, unlike today, when pre-series cars remain on a manufacturer's test fleet for long-term evaluation or are simply crushed, some of these Porsches ended up in the hands of the brand's customers.

For the benefit of those not familiar with Porsche nomenclature of the period, it's worth noting 356 and 901 were internal model designations used by the company's engineers. Before the 911 came along, Porsche didn't need any distinguishing nameplates by virtue of the fact it only made one production model. In other words, if you were a Porsche owner in the period, you told people you'd bought a 1500 or a 1600 (referring to engine capacity), or an A, B, or C model. Of course, the two-litre flat-six was always prefixed 901 until 1969, when the 2.2-litre unit was installed, but there's more. And who better to outline the evolution and highlight the variances

between the 901 and the 911 than the world-renowned maestro of Porsche tuning, Alois Ruf Jr? As well as being proprietor of automotive nirvana, RUF Automobile, he's also the proud restorer of several 901s, including the radiant red survivor you see on the pages before you. I visit him at his Pfaffenhausen base fairly regularly — at least once a year in 'normal' times — and inevitably get to try out one of his latest creations on the Bavarian blacktop for high-speed thrills.

On a recent visit, we were channelling the opposite end of the power spectrum. The creator of the fastest 911-derived vehicles in the world was out-and-about with two of the oldest of the species, namely 901 chassis 300027 (Light Ivory) and 300037 (Bali Blue), the latter being his personally owned Porsche. Just before this particular visit, there had been three 901s in RUF's jurisdiction — pretty amazing, given the model's rarity. As for the enigmatic numerology, Alois Jr pointed out how "901s don't have a logo on the glovebox, nor the 911 badge on the engine lid," and how the strip across the base of the engine bay is smooth, with no pressings where the firing order and other labels live in the segment fitted to subsequent 911s. The now familiar rubber closures sealing the engine bay were not yet in place, either.

At the time of assembly, Porsche was still debating what its new car would be named and, though the 901 type-number was probably conferred by straight-thinking engineers, Peugeot lawyers were ready to pounce. Consequently, Porsche didn't apply any identification markings until build number 236 rolled off the assembly line — the second model production series bore the now legendary 911 symbol at the 45-degree angle. In fact, in the months leading up to chassis 13325's star turn in Frankfurt, talk about Porsche's new car led journalists reporting on sightings of the first prototypes to refer to the model simply as the 2000, reflecting accepted terms of reference when talking about Zuffenhausen's output.

Take note, fact fans. There are three versions of the 911 fuel-cap lid-opening mechanism: there's the one we're familiar with on all the production cars, which is the pull-out golfing tee on the extreme left of the dashboard and, of course, water-cooled models have a pull-up lever by the right-hand sill panel, but the 901's was different again. "The first 235 cars featured a knob lower down in the doorjamb, as highlighted by the first owners' manual," Alois Jr confirms. "Porsche realised, however, that when you drive into a filling station, you need to use the petrol pump on the left-hand side because, correspondingly, the fuel filler is on the left of the car, but you couldn't open the door wide enough to pull the knob out."

As air-cooled left-hooker handlers know, this situation is experienced with potentially every fill-up. "So," he continues, "Porsche installed a linkage system, which was very much improvised, and retro-fitted it to the first cars when they came into dealerships." Not to Alois Jr's blue 901, though. "It kept the original set-up." Sure, the car's had some work, though not as much as you'd think for a classic Porsche of this vintage. "It was essentially

IN A CASE OF HISTORY REPEATING, THE FINISHED CAR RETURNED TO THE GENEVA MOTOR SHOW

Above The restoration took two years and is the sixth 901 Alois Ruf Jr and his team have restored at RUF

Above and below Pepita cloth and black vinyl are original features of the car, which appeared at the Geneva Motor Show in 1965

a very good 901, largely because it had been stored in a garage and not used for twenty-five years." It was a remarkably lucky find, too, not only for Alois Jr, of course, but also for the car itself to be 'discovered' by such a committed aficionado.

He found the Porsche in California at the turn of the century, "advertised in a classifieds newspaper, the kind you find in every grocery store by the checkout. I picked up a copy and, incredibly, saw a listing for an early blue 911. I remember the advertisement highlighting chassis number 300037 and knew it must be a really early car. Sure enough, when I checked against my reference books, it was a 901." A short while later, a deal was done, and the subsequent restoration was finished in 2003. Thereafter, the revitalised 901 (RUF's first 901 restoration, incidentally) was the theme car for RUF Automobile's fortieth anniversary celebrations that year and starred at the highly anticipated 2004 European Concours d'Elegance in Düsseldorf.

SEEING IS BELIEVING

When I saw the car at Pfaffenhausen, it was nothing short of pristine. I also saw 300027, the Light Ivory 901, and although Alois Jr was its custodian, it belonged to Canadian-domiciled Finn, Sorjo Ranta, who'd bought his rare Porsche straight off the exhibition stand of UK Porsche concessionaire, AFN, at the 1964 Earls Court Motor Show. "It's a lovely thing, isn't it?" says Alois Jr. "Its slightly warm white body is a lovely classic Porsche shade. The car was manufactured in late September 1964 with extra pressure to get it finished in time for the London date," he explains. "As expected, AFN displayed a host of 356s, but the company also unveiled this exotic new Porsche sports car."

The red 901 seen here, chassis 300078, is the most recent 901 restored by RUF. Rolling off the Porsche production line on 14th November 1964 and finished in Signal Red over black leatherette with Pepita cloth inserts, it was the first 901 to arrive in Switzerland, sold through official Porsche importer, AMAG. The lucky first owner was Claudio Ponti, a racing driver who rallied the car in his home country and Italy, before moving on to newer machinery. Interestingly, the car was displayed at the Geneva Motor Show in 1965, before making its way Stateside in the 1970s, where it would eventually be subjected to what Alois Jr describes as a "less than perfect restoration". Wind the clock forward to 2016, and the car was sold by Anspach Autos in Pennsylvania to Dutch collector, Rene van der Wall, passing into the care of Alois Jr the same year. Under his watch, RUF carried out a two-year concours restoration, completing the project in the summer of 2018. In a case of history repeating, the finished car returned to the Geneva Motor Show, placed as the star attraction on RUF's stand in 2019, before being purchased by Mick Pacey, founder of Bedfordshire-based classic Porsche restoration and sales specialist, Export 56, on behalf of a client in 2020.

"It's one of the run of eighty-two pre-series 901s and now forms part of one of the most notable collections of early Porsches outside the manufacturer's museum

in Stuttgart," Mick smiles. "Factory records indicate less than twenty 901s have lasted to the present day and, of those, only six are matching-numbers cars. This one, chassis 300078, is one of the six. Moreover, of all known surviving 901s, this is the last-known chassis-numbered example to have survived."

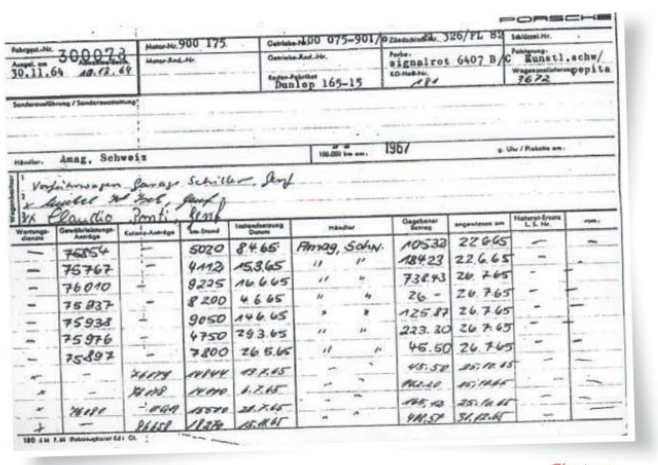
As the Export 56 901 ably demonstrates, a significant facet of RUF Automobile's business is restoration, driven by Alois Jr's deep-seated fervour for air-cooled Porsches. Indeed, including the three cars mentioned here, RUF has now restored six of the surviving eighty-two pre-series 901s manufactured, which is believed to be more than any other company. "More and more people are becoming interested in classic Porsches, but it has always been a passion for me. I remember when there was no interest in the early 911. Greater enthusiasm existed for the four-cylinder 356, but this balance has now changed, and the early 911s are proving most popular." Growing up surrounded by Porsches at his father's service and maintenance garage in Pfaffenhausen, it was inevitable he would get involved — Alois Ruf Sr first serviced Stuttgart-crested sports cars there in 1963. Alois Jr was bitten by the 911 bug the following year, when, aged fourteen, he was riding in the family car on the autobahn. "It was a rainy day in April," he recalls. "We visited the Bauma heavy equipment show in Munich. My father would always take me to see all the cranes and earth-moving stuff. We were driving at about 85mph and, suddenly, a 901 flew by. I'd never seen a 911 prototype, obviously. Rain was falling hard and the spray kicking up from the road was incredible. Our car shook from the wind of the slipstream and I couldn't believe the sound of the air-cooled flat-six."

"I'd already seen photographs of the 901 in *Hobby*, a German magazine for teenagers which published spy pictures of this curvaceous new Porsche," he continues, "but nobody knew what the name of the model was. What the magazine *did* know was that this was a new two-litre Porsche and that it was likely powered by a six-cylinder engine. The prototype was shown at the Frankfurt Auto Show in September 1963. I will never forget seeing it, but I couldn't have imagined the impact the car would have on the rest of my life." We know just what he means.

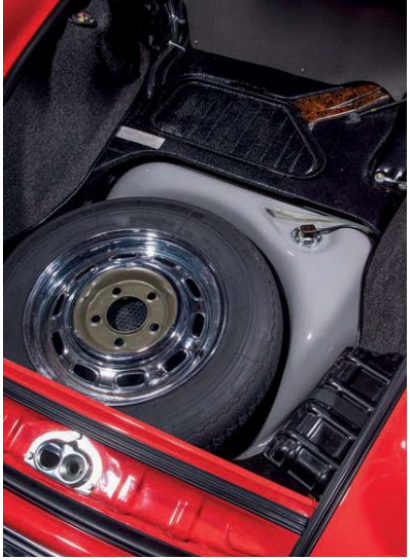
Above Note the lack of 911 badge on the engine lid

SIBLING RIVALRY

While the 911 was originally referred to as the 901, so the 912 was designated 902, even though it was already under development by the time the 901 was announced. The flat-four engined Porsche played a significant part as an entry-level model, as Alois Jr recalls. "Although



Below 300078's factory Kardex, listing original buyer, Claudio Ponti, a race and rally driver from Switzerland



Above and below Every aspect of the car has been meticulously restored by Alois Ruf Jr and the RUF team

the 911 was sensational for many driving enthusiasts, some just didn't warm to it, but after the 356 ceased production, the 912, introduced in 1965, was the perfect interim Porsche to get people to accept the six-cylinder air-cooled model, which at that time, was regarded by many as too radical, too delicate, too sophisticated and, crucially, too expensive."

The 911 wasn't all about mechanical upgrades and technology, though. "One of its main attributes was the interior," Alois Jr declares. "It boasted much more space and better visibility than the 356. People liked these features, but still wanted a reliable four-cylinder engine, hence the introduction of the 912, which made a lot of sense, especially in the USA, where it was well-suited to the country's highway speed limits. In Germany, the 912 was nice to drive and more affordable than the bigger-engined Porsche, but you were struggling to keep up with traffic, especially if an Alfa Romeo or an Austin-Healey showed up." This was certainly not the case with a well-driven 911.

Regarding the dramatic change from the 356's four-cylinder to the 911's six-cylinder engine, Alois Jr observes, "it was the sound, the performance, the throttle response, everything. Before the 901, the top model in the Porsche range was the 356 Carrera 2 and, funnily enough, both models carried two litres of displacement and both developed 130hp, but one had the four-cylinder boxer, the other the six-cylinder." Paul Frére, conducting the first road test for *Auto Motor und Sport* magazine, laid down the gauntlet. "The customer will decide because, at the moment, it's not clear which will be the preferred car," he wrote. "Is it the four-cylinder four-cam, or will it be the six-cylinder two-cam?" Revisionist history may suggest otherwise, but this is how people were viewing purchasing of a new Porsche in 1963 and 1964.

Other idiosyncrasies to address included the 901's

reluctance to restart unless the engine was good and hot. "The available fuel and spark plugs are better today, but if you start one of these early cars three or four times just to manoeuvre it around your garage or to take on very short runs, then there's every chance it will start running on five cylinders. You can run it up the road and, sometimes, this is all that's required for a reset, but more often than not, you'll have to take the plugs out," Alois Jr sighs, before suggesting the fuel pump was the biggest downside of the early 911.

"Those were the Bendix pumps," he confirms, "and when they packed up, the car stopped, and people thought their engine was broken, but in reality, they only had to take a small hammer and tap the pump once to get it running again." RUF installed a more sophisticated fuel pump to our Signal Red feature car, though it's tucked away out of sight, while the Bendix pump stays there for a show of authenticity. While we're on the subject of fuel equipment, it should be noted, the original Solex carburettors were troublesome enough for the company to switch to Webers in 1966.

Inside the 901 cabin, the seats have broad squabs and short backrests like easy chairs, but with hindsight, they're a shining example of the great strides 911 seats have taken during five decades. The gear stick is a 1950s hangover, with its Bakelite knob on top, though it feels very delicate, slotting it through its gate. The wood-rim steering wheel has four metal spokes and a central leather horn boss, while the period Blaupunkt radio is prominent in the wooden fascia. "The 901 was a big step forward in terms of dashboard instrumentation," Alois Jr expounds, "primarily because there are more functions to control than the 356 offered." One of the most puzzling things throughout the life of the air-cooled 911 was how to check the oil quantity. "It's always been something many people don't understand, which is why so many owners overfill their classic Porsche's engine with lubricant." The 901's gauges, snug in their binnacle, carry green numbers on the dials, while the door pockets fold outward. The knobs to open the doors are on the ends of the arm rests. The lack of seatbelts was slightly unsettling on my drive, but Alois Jr pointed out that, unless you retro-fit them, you don't need to bother about safety belts in Germany on cars built before 1970. The fittings are in place, though, originally intended for occupants bound for club sprints and rallies.

CHILD'S PLAY

Alois Jr is justifiably proud of his sextet of 901 restorations, and having seen the 911 in its infancy, he has accumulated a lifetime's knowledge of the model's evolution. "When I returned home from school, I would ask my dad about things he was contending with in his workshop. Bearings were a popular topic of discussion. Were they in pieces or were they okay? I'd have heard them being discussed the day before, and I'd wonder whether he was talking about a main bearing or, perhaps,

Below Alois Ruf Jr pictured with chassis 300078, shortly after completion of the restoration in Pfaffenhausen

Above The car is now part of one of the world's most impressive private collections of historically important Porsche sports cars

a connecting rod bearing? I was totally involved, learning all the time. I observed details like the little separator in between in the fender, unique to the early type 911 in the three years spanning 1964 to 1966. Other restorers often put in the later style, which was the rubber seal introduced with model updates in 1967. In fact, there were two types, one from 1967 to 1987, and another in production from 1987 until the arrival of the 964 in 1989.

These are subtle details, of course, and one could, in theory, fit the incorrect part without compromising the host vehicle." Most people wouldn't know the difference, but for RUF and like-minded restorers, such as Export 56, this simply isn't good enough. "We don't accept these kind of compromises on a car of such historical significance, not to mention the need to maintain its financial value through well-observed originality," Alois Jr scowls.

Talking of which, what is a 901 worth in today's money? It's hard to gauge because the model hardly ever comes on the market. "Right now, there's much hype about the first run of 911s," muses Alois Jr. "They're very valuable cars, and amongst those are the eighty-two 901s, but as few as maybe fifteen examples have survived." Although the contrast between these bauble beauties and his tough-guy Turbos could hardly be greater, his heart is equally drawn towards these early 911s, and he keeps track of the status quo.

What are they like to drive, these short-wheelbase proto 911s? During a recent visit to RUF, I left hilltop Kirchheim and headed down to the Swabian plain to have a play on the smooth two-lane roads that criss-cross the arable farmland. Driving the 901, the controls are well-placed, the large diameter wood-rim steering wheel has a delicate action, and the gear lever movement is very light — almost fingertip controllable — though I need to keep my left foot buried deep on the clutch whilst making the shift. The legs and feet have to work harder than arms and hands, and I have also to press pretty hard on the unassisted brake pedal to haul down the speed. The 901's flat-six has that sharp characteristic staccato bark, and it loves to rev.

Around 3,000rpm is where it comes alive — it's very eager to zing along, and at 5,500rpm in fourth gear, I'm doing a sprightly 93mph. You can feel how light the car is, when compared with later specimens. Having no power steering, I feel every bump in the road through the steering wheel, which communicates acutely what's going on between road and tyre.

Going slightly quicker, the steering weights up and there's a little bounce through the front wheels. The turn-in is great, and it seems as if the steering wakes up midway through bends by not being power assisted. It's a physical effort to actually make the turn, of course, but the handling is invigorating, making the drive feel like an adventure, as opposed to seat time in a modern car, which you know will do the majority of work for you.

THE 901'S FLAT-SIX HAS THAT SHARP CHARACTERISTIC STACCATO BARK, AND IT LOVES TO REV

RUF is a manufacturer in his own right, and Pfaffenhausen's recent offerings, such as the CTR-4, make a startling contrast with a 901. Indeed, Porsche owners in the early 1960s must have been swashbuckling types, because experience behind the wheel of a 901 is so dancy, so edgy. These cars are so involving to drive, really exhilarating. While RUF embodies road-going 911 motoring at its fastest and plushest, this is 911 motoring in its most basic and purest form. Raw, but rewarding, both sensually and aesthetically. And there's that extra frisson too, the knowledge you're driving an original — one of the very first examples of the legendary 911. There's that number thing again: in view of the success and longevity of our favourite automotive brand's flagship product — approaching six decades and counting — Peugeot probably did well to get Porsche to drop the middle zero. **CP**

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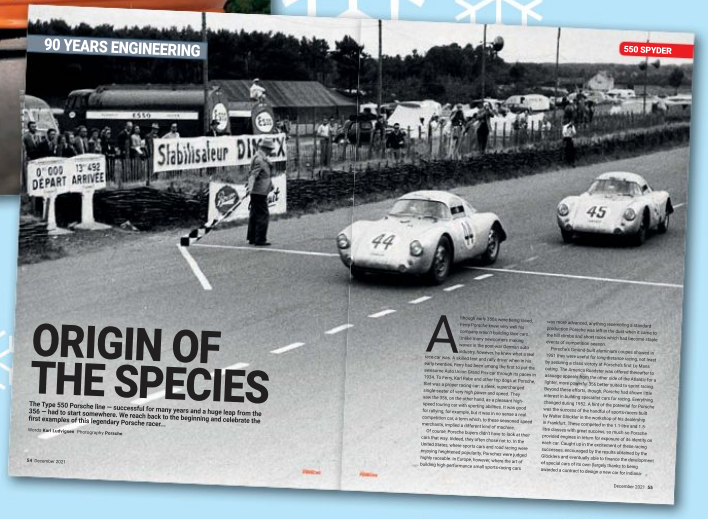

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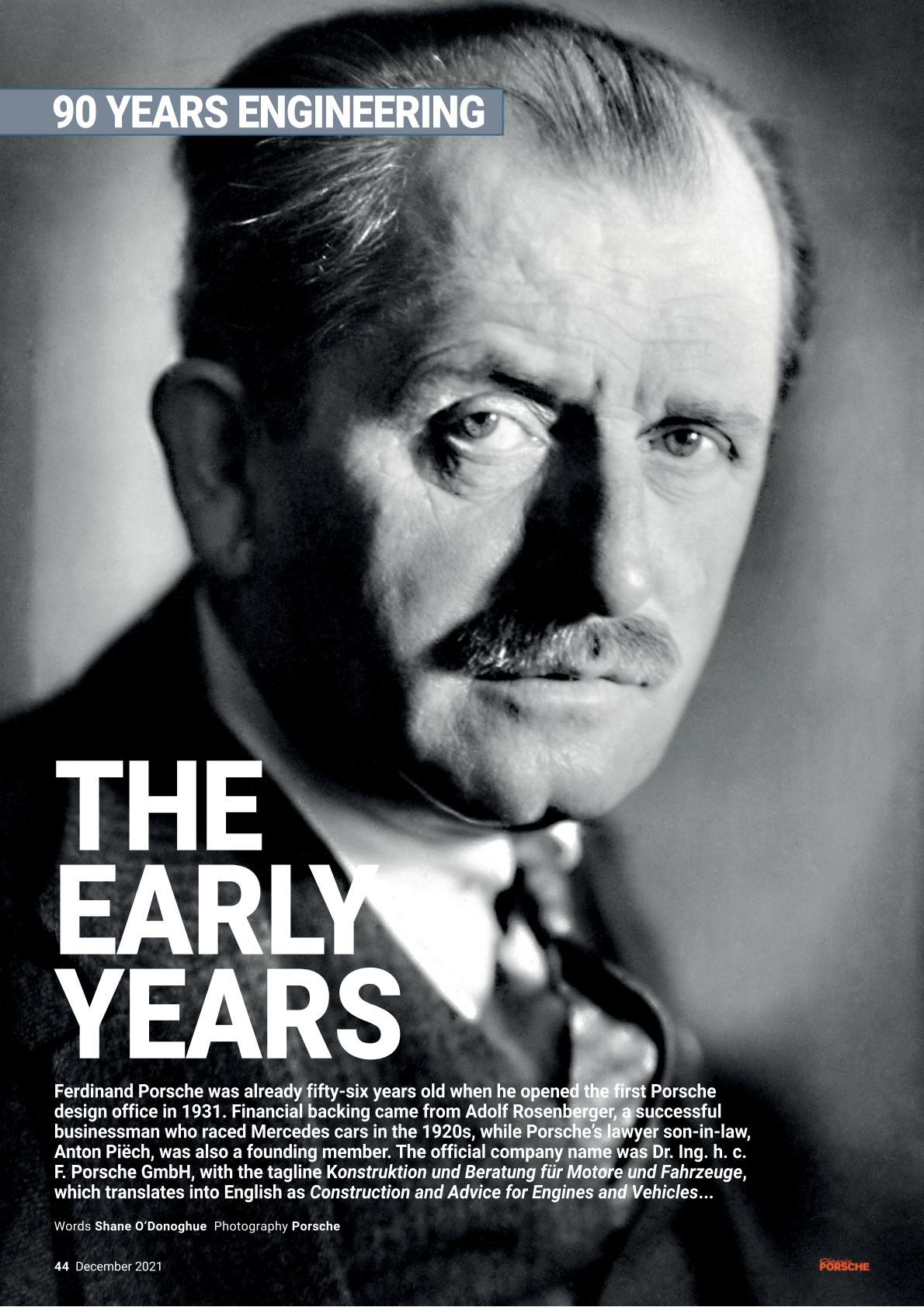
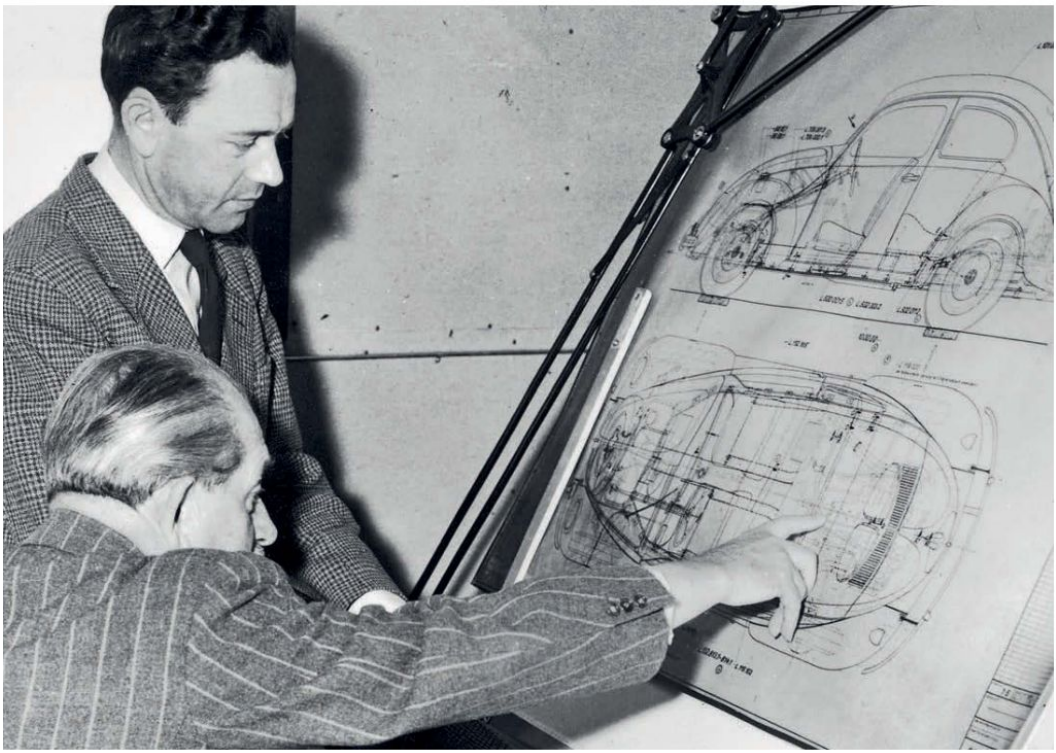


THE EARLY YEARS

Ferdinand Porsche was already fifty-six years old when he opened the first Porsche design office in 1931. Financial backing came from Adolf Rosenberger, a successful businessman who raced Mercedes cars in the 1920s, while Porsche's lawyer son-in-law, Anton Piëch, was also a founding member. The official company name was Dr. Ing. h. c. F. Porsche GmbH, with the tagline *Konstruktion und Beratung für Motore und Fahrzeuge*, which translates into English as *Construction and Advice for Engines and Vehicles*...

Words **Shane O'Donoghue** Photography **Porsche**



Above Ferry Porsche and his father, Ferdinand, studying an engineering drawing of the Volkswagen Beetle

By this stage, Porsche had already proven his engineering expertise. At the turn of the century, early in his career, he'd unveiled the Lohner-Porsche, complete with electric wheel hub motors. He further developed the concept as a series hybrid using a petrol engine. Six years later, he was Technical Director at Austro Daimler and oversaw a period of racing success linked directly with his designs — forty-three out of fifty-three race wins were completed in 1922 with a Porsche-penned compact racer named Sascha. It used a 1.1-litre engine and rudimentary streamlining to outperform rivals with much larger powerplants. This was an early sign of Porsche's interest in compact and efficient cars, but his desire to bring such a thing to the masses contradicted Austro Daimler's plans. Consequently, he resigned.

Daimler-Motoren-Gesellschaft, founded by Gottlieb Daimler and Wilhelm Maybach, was Porsche's next stop. Once again, he served as Technical Director. Eventually, the company merged with Benz & Cie, leading to the birth of Mercedes-Benz. Though Porsche worked on many cars for the company, the 1926 W02 is of particular interest due to its small size and shape. The last car he took responsibility for before he formed his own firm was the mighty Mercedes-Benz SSK — powered by a supercharged 7.1-litre straight-six — but once again, he left under a dark cloud when management prevented him from pursuing development of more compact cars.

A brief stint at Steyr (automotive arm of the Österreichische Waffenfabriks-Gesellschaft weapons manufacturer) preceded the opening of Porsche's design and engineering office, which soon welcomed its first major client, Wanderer, a German manufacturer or bicycles, motorbikes, vans and other machinery. In 1931, Wanderer commissioned Porsche to develop a new generation of pushrod overhead-valve six-cylinder engines. Focusing on 1.7-litre and two-litre variants, the engine was labelled Type 7. The following year, Wanderer sold its automotive department to Auto Union, joining Horch, Audi and DKW, but Porsche continued to work with the Wanderer brand up to the outbreak of the second World War. Indeed, early on in the contract between the two businesses, Porsche created a compact prototype for the company, built to explore the possibility of a mass-produced streamlined two-door coupe. The design didn't progress to production, but Ferdinand kept ownership of the vehicle and, importantly, its smooth design influenced Porsche's own investigations into producing a small and efficient car, years before the Volkswagen Beetle was conceived.

AGAINST THE STREAM

Those first Wanderer engines weren't very powerful, with less than 35bhp on tap for the 1.7 and 40bhp for the two-litre, but they were strong, largely thanks to a seven-bearing crankshaft design. The 1.7 first powered the Wanderer W17, a four-door saloon which evolved into the

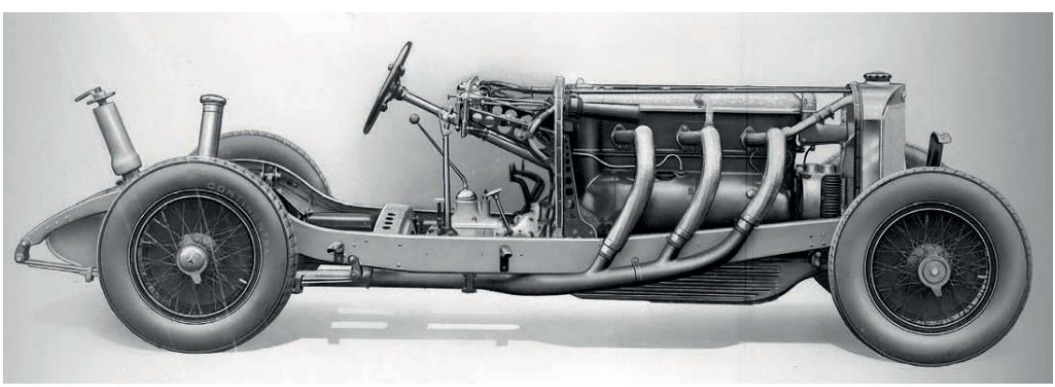
Above The Porsche Type 60, pictured at Hochtor (the highest mountain in the Ennstaler Alps, part of the Northern Limestone Alps, in Styria, Austria) in 1934

W21 and found itself upgraded with a rear subframe and swing axle using lateral leaf springs — a layout devised by Porsche. Despite the low power output, a top speed of 59mph was possible thanks to the relatively streamlined body design. The two-litre unit, meanwhile, powered the W22 to a heady 62mph. Porsche upped the capacity of the engine to 2.3 litres in 1934, but the biggest update came a year later, when he added a supercharger to the two-litre engine. This liberated a much healthier 84bhp, allowing the gorgeous W25K roadster to hit a top speed of over 90mph. The engine itself required few changes to cope with the extra stresses imposed on it by forced induction, though it didn't last very long if used at full chat for extended periods.

Porsche carried out smaller jobs for many different companies, including the aforementioned Horch (one of the predecessors of the present day Audi), but one of Porsche's biggest achievements was defining the layout of what was to become the legendary Auto Union Grand Prix race cars. In 1932, the equivalent of the FIA of the day announced a new racing formula, limiting the weight of participating cars — excluding driver, fuel, oil, tyres and coolant — to 750kg. Porsche saw an opportunity and, to limit risk to his main engineering firm, set up Hochleistungs-Fahrzeug-Bau GmbH (translating into English as High *Performance Vehicle Construction*). It set about designing a radical V16-propelled racer with the engine mounted behind the driver. This, it should be noted, was not for a client, but in the hope a client would be found.

A major milestone in the Porsche company's fortunes occurred in 1933, when Adolf Hitler — then German Chancellor — announced a duo of state-sponsored automotive projects. We'll come to the 'people's car' momentarily, but the second project was an initiative to promote the "high-speed German automotive industry" through funding of motorsport. Initially, Hitler had intended to solely fund Mercedes, but following an

Below Technical drawing of the Mercedes-Benz W06 SSK, designed by Ferdinand Porsche and in production between 1928 and 1932



Above right Hans Stuck drives the Auto Union Type A on the Schauinsland Mountain in 1934

approach by Porsche, Rosenberger, race ace, Hans Stuck and, last but not least, Chairman of the Board of Directors at Auto Union, Baron Klaus von Oertzen, he agreed both outfits should receive state finance. Subsequently, Porsche's team developed the Type 22 racing prototype (also referred to as the P-Wagen). At its heart was Porsche's incredible V16 engine, featuring just forty-five degrees in the vee — all the more remarkable when you remember the car had to weigh under 750kg. To help with this, the block was cast of aluminium and the heads were made of a light aluminium alloy. It made do with a single camshaft, too, positioned high up in the middle of the engine. This controlled the timing of all thirty-two valves. Close to the camshaft, rocker arms were used to push the inlet valves in each bank open, while pushrods enclosed in distinctive tubes spanning the tops of each side of the vee connected to rocker arms for opening the exhaust valves.

RETURN TO THE CHARGE

The first iteration of this engine boasted 4,360cc displacement, two Solex carburettors and a supercharger. Peak power of 295bhp doesn't sound sensational now, but it was backed up by a hefty 391lb-ft of torque at just 2,700rpm. — impressive for the day and little wonder the Auto Union racers had a fearsome reputation for their 'challenging' handling. Though the mid-engined configuration should have made the cars well-balanced, of course, a lack of structural stiffness in the chassis contributed to unexpected behaviour as it flexed. Additionally, the considerable torque of the supercharged engine resulted in excessive wheelspin,

Below The Mercedes-Benz SSK, an acronym for *Super Sport Kurz*, translated into English as *Super Sport Short*

especially of the unloaded inside wheel on the exit of a bend. Porsche devised the idea of a limited-slip differential to cure the problem and commissioned ZF to make turn his design into a reality.

Porsche remained involved with the Auto Union race car project through to the Type C which competed in 1936 and 1937, eventually enlarging the V16 to six litres, developing up to 520bhp and an eye-watering 627lb-ft of torque at just 2,500rpm. The car could pull more than 200mph. Auto Union wasn't happy to leave things there, though — its Grand Prix cars were streamlined with new bodywork to increase top speed. On-circuit competition between Auto Union and Mercedes was fierce from the moment Hitler decided to fund both companies, and this rivalry extended to the pursuit for speed records, too. Many were established. Porsche was at the heart of it all.

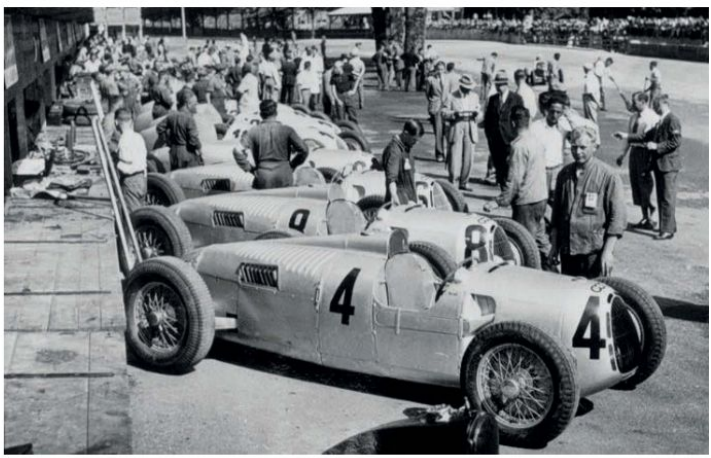
When the Auto Union contract expired in 1937, Mercedes commissioned Porsche to develop a totally new performance car, the T80, designed from the ground up to surpass all previous record breakers. Power was set to come from a Mercedes aero engine. The goalposts moved several times during the project when others set new speed records. So much so, by the time the project was mothballed in 1940, a target speed in the region of 400mph was on the cards, requiring nearly 3,500bhp from the latest Daimler-Benz 603 V12 aero engine. Porsche devised an enormous vehicle to house the unit and to enable the use of streamlining. The car measured more than eight metres in length. Six wheels were used, each measuring 1.17 metres in diameter (calculated to increase to 1.24 metres at 400mph) and arranged on different track widths to suit the streamlined body. Total weight was 2,800kg.

CLOUD NINE

There was plenty of evidence of Porsche ingenuity at work, including the spindle steering system. The T80 could steer just nine degrees to each side, requiring a three-quarter turn of the flat-topped steering wheel. The suspension used parallelogram arms swinging in the direction of travel up front and a pendulum swing axle system with supporting struts at the back. Drive from the engine went directly to the two rear axles via a six-disc thermal clutch with automatic centrifugal

Above Bernd Rosemeyer winning at Donington Park in an Auto Union Type C, 1937

Bottom left Porsche Type 60 (Volkswagen 30) prototype pictured in 1937



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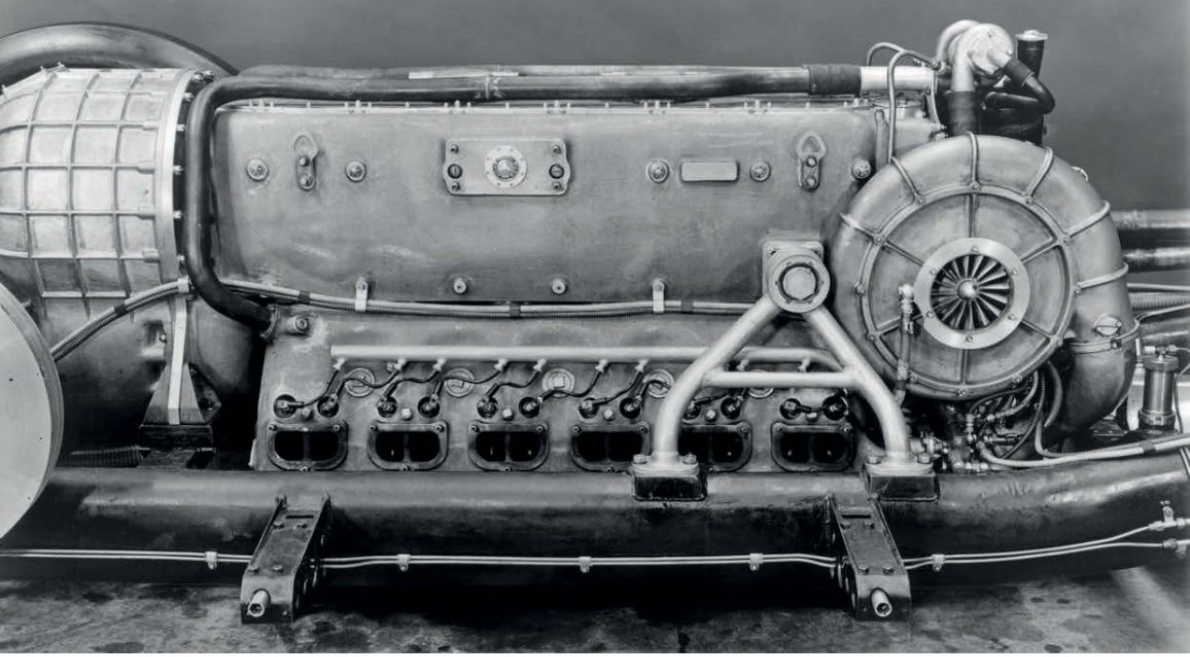


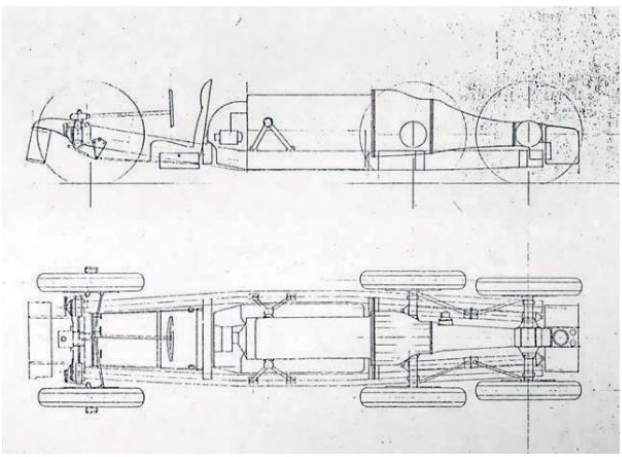
force adjustment. No transmission was needed due to the torque produced. Nonetheless, Porsche came up with an innovative mechanical method to prevent wheel spin when moving off from rest, in a bid to preserve the tyres. An automatic torque compensator registered any slip in the rear wheels via the differential gear and used the centrifugal governor to regulate the engine torque. Unfortunately, the T80 would never be used in anger — the car was put into storage as war loomed large.

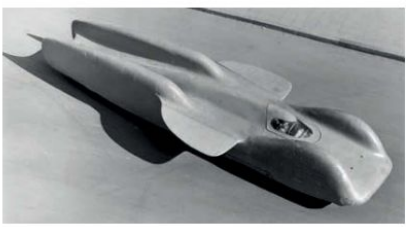
Jumping back a few years, not long after Porsche secured the Auto Union work, he submitted proposals to the German Reich's Transport Ministry in Berlin for a "Study on the Construction of a German People's Car" — Type 60 in the engineering company's nomenclature. It's worth mentioning at this point how Porsche had worked on stillborn small-car projects — first with Zündapp and then NSU — and though none had been brought to fruition, experience on the subject at the Porsche agency was extensive. An official order for a prototype was soon received from the Reichsverband der Deutschen Automobilindustrie (German Reich Automobile Industry Association). Hitler's remit for the new car was that it could carry a family of five at speeds of up to approximately 60mph, but it had to be ultra-cheap to manufacture and maintain. Air cooling of the engine was decided upon at an early stage to ensure the car's owner didn't need to keep it in a garage overnight, the inference being the new vehicle would be designed for the ordinary German, who was unlikely to have indoor storage to protect the engine from sub-zero winter temperatures at a time anti-freeze was in its early stages of development. This instruction perfectly suited Porsche, who already favoured a rear-mounted flat-four.

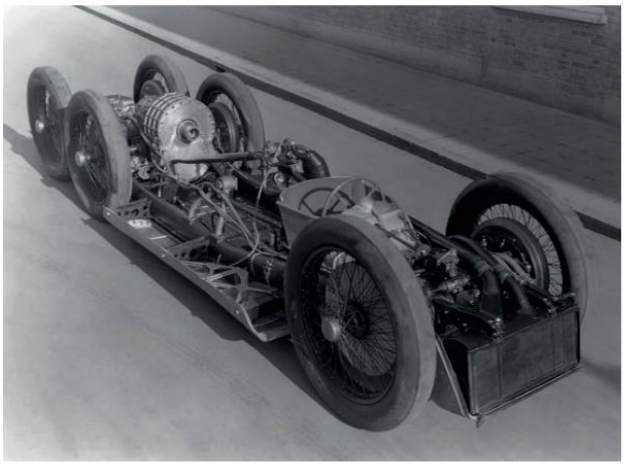
He demonstrated working prototypes in 1935. More than 30,000 miles was covered in each car by the end of 1936. In the meantime, Hitler changed production plans.

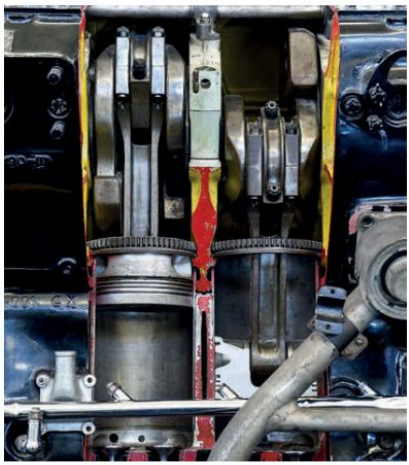
Above Sorry, but the T80's 3,500bhp 44.5-litre DB603 inverted V12 won't fit into the back of your 356

Below The T80 was designed by Ferdinand Porsche to break the world land speed record, but the car never made the attempt due to the outbreak of the second World War









Above T80 chassis clearly shows the six wheels, linked to three axles spread along eight metres of body length weighing 2.8 tonnes

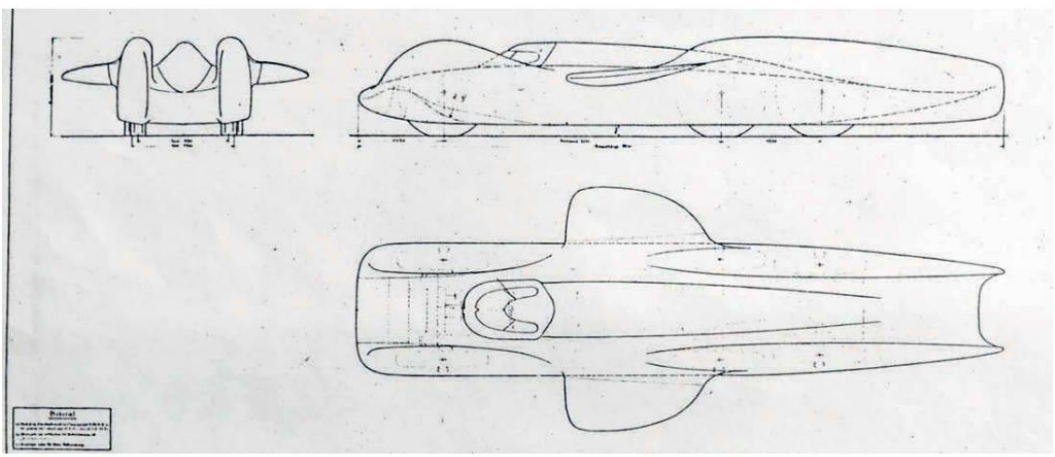
Originally, the 'people's car' was due to be manufactured by Germany's existing automobile producers en masse, but resistance from industry leaders saw Hitler commit to creating an all-new 'Volkswagen' factory. He tasked Ferdinand Porsche with realising his ambition. Porsche promptly spent six weeks in Detroit learning about Stateside automotive mass-production techniques and returned to Motor City the following year to purchase equipment and recruit manufacturing experts. Porsche was also made executive director of a new company established to manufacture the 'KdF-Wagen' (*Kraft durch Freude*, translating as *Strength through Joy*).

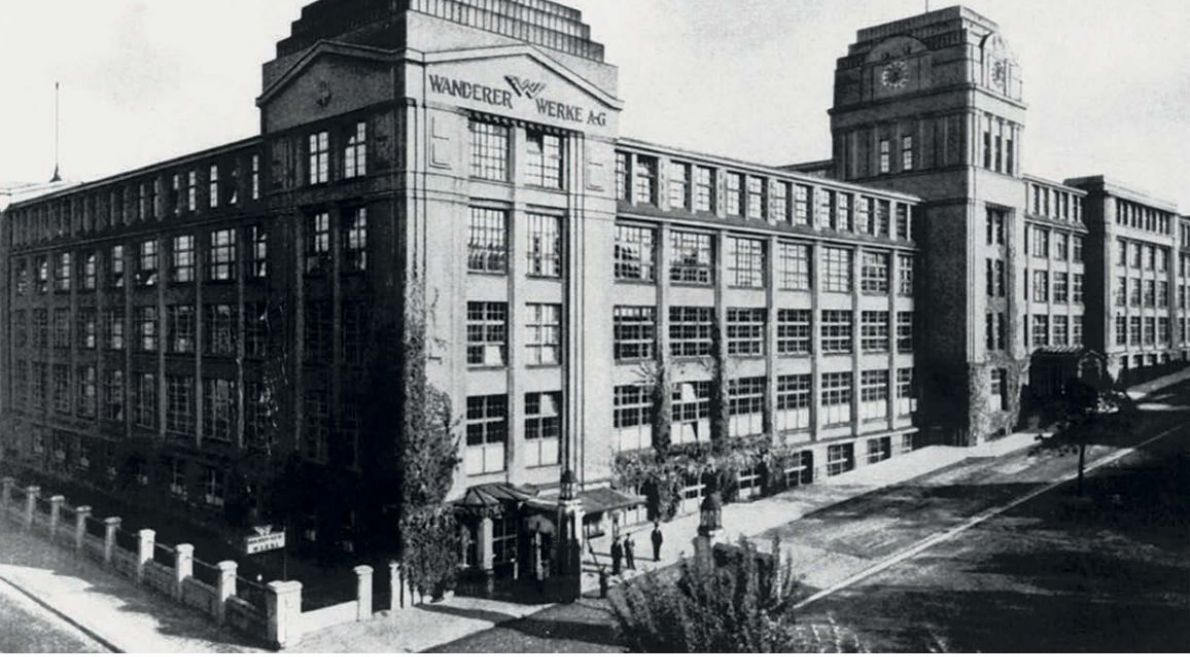
By 1938, following three years of refinement, the form of the Beetle (as we know now it) was finalised and unveiled as the Volkswagen Type 1. Small-scale production began, but only a few hundred examples of the new car were produced before the war started and factories and equipment were commandeered for the military use. Porsche's talents were employed for the same reason. In fact, during the war, he was responsible for a number of advanced engineering and automotive development projects for axis forces, from heavy tank designs to hybrid-electric anti-tank guns (the Panzerjager Tiger was even known as the 'Ferdinand') and much more besides. The scope of this subject is beyond this article, suffice to say we'll return to it in detail for a forthcoming issue of *Classic Porsche*.

TRADING PLACES

In 1944, Porsche moved its engineering base to Gmünd in Austria in order to achieve respite from allied air raids. The following year, after the end of the war, this location was given the go ahead to "undertake design work on motorised tractors, gas generators and other civilian equipment", as well as to repair "motorised vehicles and agricultural machinery." Porsche wasn't entirely sure how to resurrect his automotive business, though he would have more pressing matters to deal with — on 15th December 1945, French authorities arrested Porsche, his son, Ferry, and Piëch (who had acted as head of Volkswagen between 1941 and 1945) as war criminals. Ferry was freed after six months and quickly took up

Below and facing page Porsche's technical drawings for the T80's aero-inspired streamlined bodywork



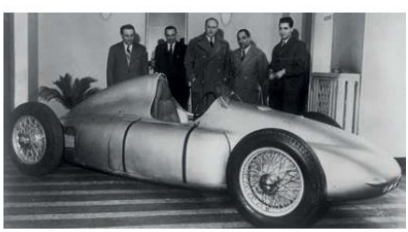


the reins of the family firm, entertaining an approach from then new Italian motorsport company, Cisitalia (an abbreviation of *Compagnia Industriale Sportiva Italia*), to design and develop a new Grand Prix car (the Type 360), along with a road car, a small tractor and a water turbine. Porsche was back in the world of racing, but now with Ferry at the wheel.

By any measure, the Type 360 project was a catastrophe. Masses of post-war red tape caused no end of delays (Porsche the Elder would remain incarcerated for twenty-two months), the car was fiendishly complicated to build and, by the time it was anywhere near ready, Grand Prix rules and regulations changed. Only one example of the Type 360 was made, but it never raced. The Italians had, however, effectively paid for Ferdinand Porsche's freedom by investing in the project up front, allowing Ferry to pay the million francs requested by the French government for the release of his father and Piëch — despite the required fee, both men were cleared of charges relating to slave labour in factories under their watch, though much evidence was subsequently presented to challenge the verdict. Away from the murky world of post-war law courts, Cisitalia's coffers were helping Ferry Porsche to give his father's firm a serious creative shot in the arm, too. The Type 360 itself, while using lessons learned from the Auto Union racing days, featured many innovations. It had a rudimentary sequential gear shift, for example, along with selectable four-wheel drive and fully independent suspension in all four corners. Power came from a supercharged 1.5-litre flat-twelve designed by Ferdinand and mounted behind the driver, producing about 300bhp. And, while Cisitalia went a different direction for its road car (using cheap Fiat components married to a sporty body), Ferry learned much from the experience, very soon turning his attention to a Porsche-branded own two-seat sports car based on Volkswagen mechanicals. And we all know how that went, don't we?! **CP**

Above The Wanderer Werke factory in Chemnitz was destroyed in early 1945

Below, clockwise from left Wanderer at the 1931 Berlin Motor Show, the Wanderer W22 convertible (six-cylinder inline engine, two litres displacement, 40hp), the innovative Porsche Type 360 Grand Prix car for Cisitalia



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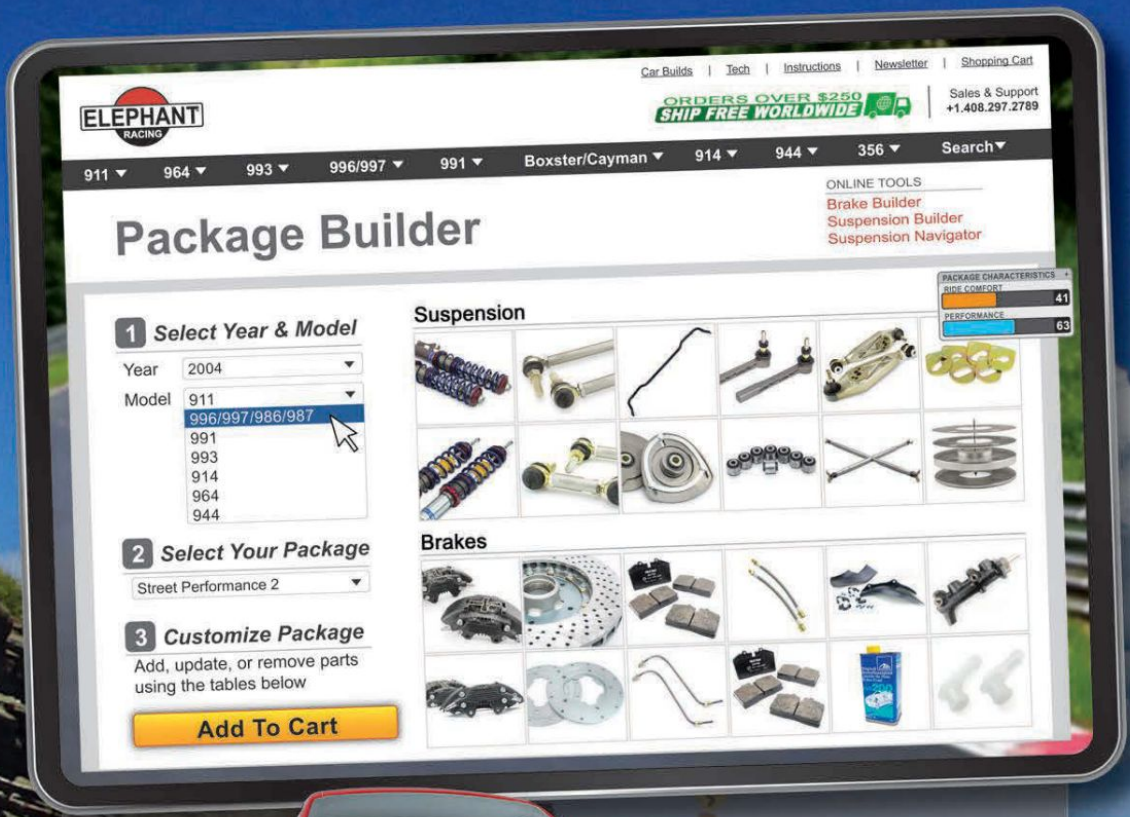

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ORIGIN OF THE SPECIES

The Type 550 Porsche line — successful for many years and a huge leap from the 356 — had to start somewhere. We reach back to the beginning and celebrate the first examples of this legendary Porsche racer...

Words **Karl Ludvigsen** Photography **Porsche**

Although early 356s were being raced, Ferry Porsche knew very well his company wasn't building race cars. Unlike many newcomers making waves in the post-war German auto industry, however, he knew what a real race car was. A skilled test and rally driver when in his early twenties, Ferry had been among the first to put the awesome Auto Union Grand Prix car through its paces in 1934. To Ferry, Karl Rabe and other top dogs at Porsche, *that* was a proper racing car: a sleek, supercharged single-seater of very high power and speed. They saw the 356, on the other hand, as a pleasant high-speed touring car with sporting abilities. It was good for rallying, for example, but it was in no sense a real competition car, a term which, to these seasoned speed merchants, implied a different kind of machine.

Of course, Porsche buyers didn't have to look at their cars that way. Indeed, they often chose not to. In the United States, where sports cars and road racing were enjoying heightened popularity, Porsches were judged highly raceable. In Europe, however, where the art of building high-performance small sports-racing cars was more advanced, anything resembling a standard production Porsche was left in the dust when it came to the hill climbs and short races which had become staple events of competition season.

Porsche's Gmünd-built aluminium coupes showed in 1951 they were useful for long-distance racing, not least by securing a class victory at Porsche's first Le Mans outing. The America Roadster was offered thereafter to assuage appeals from the other side of the Atlantic for a lighter, more powerful 356 better suited to sprint racing. Beyond these efforts, though, Porsche had shown little interest in building specialist cars for racing. Everything changed during 1952. A hint of the potential for Porsche was the success of the handful of sports-racers built by Walter Glöckler in the workshop of his dealership in Frankfurt. These competed in the 1.1-litre and 1.5-litre classes with great success, so much so Porsche provided engines in return for exposure of its identity on each car. Caught up in the excitement of these racing successes, encouraged by the results obtained by the Glöcklers and eventually able to finance the development of special cars of its own (largely thanks to being awarded a contract to design a new car for Indiana-

based brand, Studebaker), Porsche decided to design and build new competition cars in 1952 to replace its able but ageing Gmünd coupes.

Ferry Porsche knew how racing, both by the factory team and by privateers, had enhanced the reputation and the sales of his cars. During 1952, racing had also gained a powerful new advocate within the Porsche organization: Huschke von Hanstein. 'The Baron' had been a successful racer before the war, competing at Le Mans with Adler and co-driving to win the 1940 Mille Miglia for BMW. Charmingly and persistently persuasive both inside and outside the Stuttgart company's walls, von Hanstein became to Porsche what Alfred Neubauer was to Daimler-Benz: the resident representative of the spirit of motor racing. Socially, he was well-connected in the international circles of the sport, giving him the authority to help shape Porsche's technical and political racing policies. At this point, it's worth noting, he had extra leverage in implementing his initiatives because he also controlled the Porsche press department, essentially the brand's official voice.

FRESH CHALLENGE

By mid-1952, von Hanstein and others at Porsche could see the handwriting was on the wall for their budding reputation in the racing world. In the 1.1-litre class, Italy's OSCA presented a formidable new threat with its purebred racing engine. OSCA was also beginning to invade the 1.5-litre class, which was won at Sarthe that year by a British Jowett Jupiter. In Germany, meanwhile, Borgward and the East Zone's EMW were presenting strong opposition in the bigger-displacement class. Against this improving competition, Porsche could no longer rely on modified and lightened versions of its production cars. If it were to defend its position as 'the one to watch out for', it needed something better suited to racing than the 356.

Following the 1952 24 Hours of Le Mans, two new design studies were initiated under the general supervision of Rabe. One of these projects, designated Type 547, was a new engine designed to offer vastly more development potential within the same general size and structure as the old power unit. This new engine was viewed by Ferry Porsche as a research tool with which Porsche's engineers could extend their knowledge of high-performance air-cooled automobile powerplants. The other project, Type 550, was to have more immediate consequences — it was a new car to be used by the factory for racing.

Little original research was required for the 550 project, for the car was to be powered by existing Porsche pushrod engines and patterned closely after the successful mid-engined Glöcklers. The work was overseen by Wilhelm Hild, who before the war had looked after the racing campaigns of DKW. He and his small cadre of craftsmen designed and built the first two Type 550 cars during the early spring of 1953.

Their principal target? Le Mans. Completion of a new Porsche factory building in late 1952 — another Porsche project made possible by the lucrative Studebaker contract —enabled the race crew to move out of their old brick barracks and into spacious new workshop quarters, which they shared with Porsche's experimental department. A separate *sanctum sanctorum* was partitioned off to conceal from snoopers the existence of a formidable new competition car.

Porsche was on the rise, but time and money were hardly in plentiful supply when the company decided to build its Type 550 prototypes, which is why their design was kept simple. The frame was like those of the Glöcklers: a ladder of welded steel tubes with six crossmembers. Its front crossmember was smaller than the others, while the rearmost member housed the torsion bars for the rear suspension. As in all the mid-engined Glöcklers, the flexible steel radius arms reached forward from the torsion bars to the rear hubs instead

Above After the German Grand Prix on August 2nd 1953, the 550s reverted to open trim when competing in the race for 1.5-litre sports cars, with Hans Herrmann driving 550-02 with verve and leading the ninteteen-car field

Previous spread Although the no.44 car is just ahead as Charles Faroux flags the Porsche double finish at the 1953 24 Hours of Le Mans, officials award no.45 car the 1.5-litre class win, the pair finishing fifteenth and sixteenth overall

COURTESY PETER HARHOUT

Above Liveried as per its racing appearance in 1953's Carrera Panamericana, 550-01 became one of the treasures of the famous Collier Collection

of trailing back to them as they did in the 356. This was a reversion to the suspension design of the original 356 roadster of 1948, in spite of the known drawbacks of that layout, especially the need to have robust frame structure all the way to the rear of the chassis.

Placed as low as possible, the frame passed beneath the rear swing axles. Supplementing the rear torsion bar springs were heavy circular rubber loops, one at each side, in tension between the axle housing and a pulley-like retainer which was attached to the frame below. At first, Houdaille lever-type shock absorbers supplanted the standard rear dampers, but before the 550 entered its first race, these were replaced by large double-acting telescopic shocks, hung from tubular towers welded to the frame. Front suspension, steering, wheels and brakes were similar to those used on the production Porsches.

Instead of relying on a cable to operate the clutch (as the Glöcklers did), Porsche adopted hydraulic actuation through a cylinder mounted on the outside of the clutch housing. The transmission was the latest synchromesh type and the differential a ZF self-locking (or 'limited-slip') assembly. Karl Rabe and his associates knew this unit very well indeed, for they had encountered it in tractors and other cross-country vehicles and — at Ferry's suggestion — had first used it in the Auto Union Grand Prix cars of 1935.

The engine of the first 550 was the familiar 1500 Super pushrod four, specially tuned for higher power. In September 1952, it had been developed to its then-record output of 98 horsepower, achieved by burning alcohol fuel on a compression ratio of 12.5:1. Its heads were topped by twin-throat Solex 40 PII downdraft carburettors. Each inlet port was fed by separate venturi to ensure it could be tuned for the best power curve by an individual ram pipe atop the carburettor. An external oil cooler was fitted in the nose of the new 550, although the engine retained a wet-sump lubrication system.

In another link with Glöckler tradition, Frankfurt-based coachbuilder, Weidenhausen, was contracted to make aluminium bodies for the two 550s built for the 1953 season. The new Porsche's body, however, was awkwardly realized. Its rounded tail was oddly contoured, while its low nose was flanked by clumsily formed front fenders. With a wheelbase of 82.7 inches and an overall height of 51.2 inches, the initial 550 was a coupe weighing about 1,200 pounds.

A deeply curved windscreen and tapering coupe hardtop, conceived as being especially suitable for Le Mans, were part of the 550's original shape. Taking a close interest in its detail was Ferry Porsche and his head designer, Erwin Komenda, who filed for a patent on the 550's configuration on May 23rd 1953. Features of note were the car's built-in rollover bar (anchored to the tubular frame), strategic venting and a combined firewall and noise barrier.

The first car to be completed, 550-01, was given a pre-Le Mans try-out in the Eifel Races at the Nürburgring on May 31st 1953. It ran as a roadster, though the weather was so wet that driver Helm Glöckler (providing

Below At Le Mans in 1953, the nose of the big Ferrari behind the no.44 Porsche rose high as its driver accelerated down the run to Tertre Rouge — the Ferrari wouldn't finish the race

Above Then narrow, the pits straight at Le Mans witness the no.44 Herrmann/Glöckler 550 in 1953

yet another link with the cars from Frankfurt) might have welcomed the hardtop's protection. During the dry practice session, Glöckler used all the power of Porsche's best alcohol-fuelled pushrod engine to set an excellent new lap time for the 1.5-litre sports-car class. During the race, however, he had to combat not only the rain and the latest four-wheelers from Borgward and EMW, but also carburettor trouble, which kept his engine speed down to 5,400rpm instead of the target 6,000rpm. Even so, he won the eighty-five-mile race, making Porsche's Type 550 a winner its first time on the track

The second 550, chassis 550-02, was originally built with the tapered Taunus headlights Weidenhausen was installing on the 1953 Glöcklers. These were changed before Le Mans to conventional vertical headlamps, set farther back than those of the first car. For the daylong race, both 550s were given additional driving lamps flanking a low inlet slot for the oil cooler. They were also fitted with well-seasoned — close to a thousand miles apiece at the start of the race — 1500 Super engines with compression ratios raised to 9.0:1, enlarged and polished inlet ports and dual-throat Solex carburettors. These modifications increased maximum power to 78bhp on gasoline.

Paired with Glöckler in 550-01 was Hans Herrmann, a young Swabian who had performed well with Porsche sports cars and would go on to achieve international stardom as a consequence of daring, triumphant driving in the Mille Miglia. Later, he learned Porsche's Managing Director, Albert Prinzing, had agitated behind the scenes for Herrmann's inclusion alongside Glöckler. Two driver-journalists shared 550-02: Richard von Frankenberg and Paul Frère, the latter replacing Huschke von Hanstein. Ferry Porsche felt that for such an important event, von Hanstein should be in the pits managing the team, not in the cockpit.

New to both the mid-engined Porsche and Le Mans, Frère was in for a surprise. It was turning dark by the time he had a chance to drive on a circuit he was facing for the first time. Making matters worse, the plucky Belgian assumed the 550 would handle significantly better than a standard 356. "On the first lap, I very nearly lost control on the first left-hander after the Dunlop Bridge! The 550 is a very tricky car," he remembered after the event. Mid-engined or not, the novel elements that made up the 550 contributed to sudden (albeit manageable) oversteer. Unlike Frère, the other drivers were well used to this.

The question of whether or not to race with the coupe tops in place was left undecided by von Hanstein and Hild until practice at Le Mans. The tops enhanced top speed —timed at 124mph at 5,400rpm on the Mulsanne Straight — but at a tremendous cost to the drivers' well-being, not least because they were beset by buzzing and roaring of the thin metal panels, claustrophobic tightness of the cockpit and the absence of any ventilation, save for a slot in the driver's door window and a few louvers in the roof. Regardless, they decided to put up with these inconveniences to reach the high speed so valuable when competing at Le Mans.

During night practice, an anomaly was noted. Revving up to 5,400rpm during the day, speed fell to 5,200rpm in the evening. Various engine checks made no improvement. Finally, the penny dropped: turning on the headlamps affected the readings of the electric tachometer. This led to the decision to impose a 5,000rpm limit for the race, as did concern about oil temperature. In practice (and in the race), the engines were troubled at their highest revs by oil temperatures that rose to some 130°C, too close for comfort to the danger level (anything in excess of 140°C). "The cause of the rise in temperature," Frère wrote later, "was the type of oil radiator fitted, which was unsuitable for positioning at the front of the car."

Above The happy Porsche crew from Rolf Wütherich (far left), Hans Klauser in white cap, Hugo Heiner, Huschke von Hanstein, Bruno Trostmann, unknown, Helm Glöckler, Willy Enz, Hubert Mimler and on the right, Richard von Frankenberg

Fortunately, the 550s never had to exceed their 5,000rpm rev limit to dispose of rivals in a race which saw the Porsches within one lap of each other at all times. In fact, they crossed the finish line at just the same interval which had separated them at the start. Nevertheless, the Le Mans scorers — for whom dead heats were invidious — found an extra nine-tenths of a mile with which to credit von Frankenberg and Frère, meaning 550-02 became the winner and new record holder in the 1.5-litre class at Le Mans.

Initially in the lead, Frère's Porsche was caught up by Glöckler's. Thereafter, they often ran in tandem. Pit stops were routine, so much so the crews gave the coupes a quick wash-down to show off their glistening silver bodywork. Number 44 set the fastest Porsche lap at 5:16.8 on its forty-seventh tour, good for better than 95mph. Fastest for number 45 was its twenty-fourth lap, recorded at 5:21.3. In the early part of the race, the 550s lapped at around 5:30, but as competing teams retired their cars, this time was extended to 5:45 and, eventually, to more than six minutes. Although a victory in the Index of Performance was on the cards, the team elected not to pursue this because it wasn't seen as being of great significance in the important German and American markets. At the slower speed of the last third of the race, Frère felt as if he "was out for a Sunday spin. Any taxi driver from Le Mans could have taken my place in the driving seat during the last eight or nine hours without the result having been affected. All my illusions vanished, for I had always thought that considerably more was involved in even a class win at Le Mans!"

Soon after the French classic, the cars raced again (as coupes) in Berlin on the famous Avus track. Consisting of two expressway lanes joined by a flat turn at one end and a high banked curve at the other, Avus placed a premium on high maximum speed. It was not to be Porsche's day, however. Glöckler spun and badly wrinkled the left side of 550-01, while Herrmann lost a cylinder and dropped to second place, finishing behind a Borgward. The Porsches did better as open cars at the Nürburgring on August 2nd, after the German Grand Prix. Obviously a rising star, young Herrmann won the seven-lap race for 1.5-litre cars with 550-02. Driving the sister car, Glöckler fell off the pace when his Porsche developed valve trouble.

AFTER LIFE

The careers of these two pioneer Porsches were still far from over. At Freiburg on August 9th 1953, Herrmann won his class in the annual hill climb with 550-02, thus clinching the 1.5-litre sports-racing championship in Germany for himself and Porsche. His time of 8:00.1 minutes was within a second of the record Bernd Rosemeyer had set in an Auto Union before the war. Glöckler drove 550-01 to the fourth best time in the class. Both cars then returned to Zuffenhausen for a complete overhaul — Porsche had arranged to sell

Below The hardtops of the two 550s at Le Mans in 1953 benefited from super-low drag

them to a group of enthusiasts in Guatemala, headed by Jaroslav Juhan. Born in Czechoslovakia, Juhan was a former champion motorcycle racer who operated a garage in the Central American nation.

Porsche prepared the cars for one of Juhan's main targets: the fourth Carrera Panamericana, a gruelling five-day race beginning at Tuxtla Gutierrez in southern Mexico, 115 miles from the Guatemalan border. Engines tuned to Le Mans standards were fitted, with twin wire-mesh air cleaners on each of their Solex carburettors. A reserve oil tank with an outside filler was installed on the left side of the engine room and four cooling louvers were punched in each side of the body behind the door. Two spare wheels and tires were carried, one at the front and one in the extreme tail.

GLOBE TROTTERS

Before the end of August, these two cars were crossing the Atlantic on their way to Guatemala. For the attack on the Carrera Panamericana, beginning on November 19th, Juhan drove 550-01, while Jose Sala Herrarte Ariano, also from Guatemala, drove 550-02. In this typically eventful race, Juhan's Porsche was the fastest 1.5-litre car over four of the eight timed stages, but he was forced to retire, leaving the class victory to Herrarte and the second mid-engined Porsche. The second and only other official finisher in class was the stock 356 driven by Fernando Segura, which the Argentine had bought just two weeks earlier.

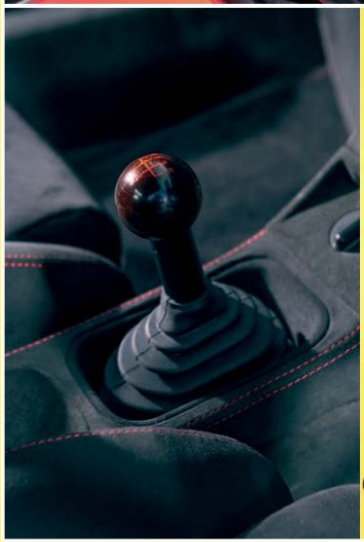
The Guatemalan enthusiasts then removed the tops from their Porsches and entered them into the 1954 1,000km of Buenos Aires. This time, Juhan and Antonio Asturias Hall in 550-01 came out on top, winning the class and placing ninth. Herrarte, driving 550-02, also with the help of Hall, finished thirteenth overall. One of the cars appeared at Sebring in March 1954, entered and driven by Fernando Segura, who may well have purchased the Porsche from the Guatemalans after the Buenos Aires race. Partnered by Bojanich, Segura placed tenth in the twelve-hour Florida event.

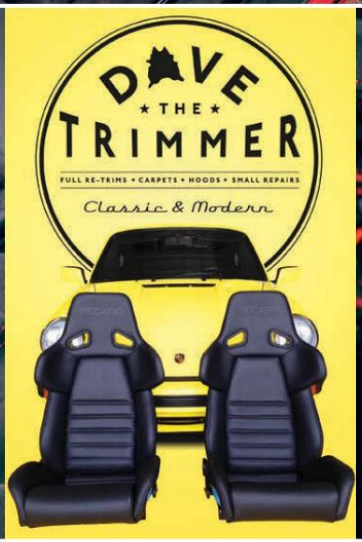
A successful appearance in the fifth and last Carrera Panamericana, held in November 1954, was made by 550-01, entered and driven by Salvador Lopez Chavez of Mexico. Driving a consistent race, Chavez placed fifth in the 1.5-litre class with a time one hour less than that attained the year before by the class-winning Herrarte. The car remained in Mexico to compete in home events until its career was considered done and dusted. Amazingly, at the beginning of the twenty-first century, 550-01's remains were discovered by someone who knew just what they were looking at.

Ultimately, the car returned to the USA to be restored by classic Porsche expert and master fabricator, Joe Cavaglieri, founder of Cavaglieri Restorations in Sherman Oaks and the man responsible for restoring 550-03 and 550-04. Wearing a perfect facsimile of its 1953 Carrera Panamericana livery, 550-01 now resides in the Collier Collection, Florida, where it reminds us greatness has to start somewhere. **CP**

Above Paul Frère discusses his next stint on the pit counter while he awaits completion of work, then takes his seat for his night-time stint at Sarthe

Below The Nürburgring pit-straight crowd was still dense at 6:33pm, when Herrmann saw the checker at the Green Hell's finish line in 1953





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BLUE BLAZES

Vic Cohen's five-decade journey exploring weird and wonderful air-cooled 911s has culminated in the restoration of a stunning 1971 2.2 S in partnership with one of the UK's most trusted marque specialists…

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

Taking a deep breath, Vic Cohen begins to consider all the air-cooled Porsches he's owned over the years. "The first was a 2.2-litre 911 S I bought from AFN in 1971," he recalls. "It was a great car, very fast." Perhaps a tad too fast? "I lost my driving license. Consequently, enforced absence from the public highway encouraged me to take up in employment in Southeast Asia for three years. When import taxes were taken into consideration, a new 911 in Singapore was double the cost of buying one in Britain, which is why I waited until returning to Blighty in 1975 until getting back behind the wheel of a Porsche product." The car he bought was a Targa-topped 911 E loaded with a 2.4-litre engine and painted in dazzling silver, a suitable finish considering the reputation of the car's previous owner. "It belonged to Justin de Villeneuve," Vic exclaims. Born Nigel Davies and something of a renaissance man, de Villeneuve is most famous for 'discovering' Leslie Hornby, known globally as Twiggy, the world's first supermodel. Before becoming Twiggy's agent, as well as her personal photographer and husband, de Villeneuve spent time working as an entry-level hairdresser for Vidal Sassoon


443 KOR

and even catered the legendary stylist's first wedding. More than a decade later, in the early 1970s, Twiggy was an international superstar and de Villeneuve was living the high life, working his way through an astonishing two-dozen sports cars a year. Vic's semi-open-top silver machine was one of them. "It was offered to me for £3,750 and had only covered fifteen thousand miles. In every way possible, it was mint!" he beams.

SLIDE AWAY

Eighteen months later, his eye was caught by a pre-loved Carrera RS 2.7 being offered through Charles Ivey Specialist Cars. "I'm not afraid to put miles on my Porsches," he points out. "I spent most of my working life in the City of London and drove my 911s in and out of the capital every day." One snowy morning, however, the RS registered complaint. "I was closing in on Stirling Corner, the bottom of the Barnet bypass stretch of the A1," he remembers. "The ground was super-cold and the 911 lost traction, flying into a lamppost. I was dressed in a white Carrera-branded top, but I split my head open in the accident and covered my bright white clothing in blood. It was a gruesome scene. I was okay, but the car didn't fare as well — it ended up being dissected for parts. In fact, the engine went to John Greasley, a well-known Porsche personality and founder of G-Force, once one of the UK's largest and most successful Porsche motorsport and tuning specialists. He used the RS's flat-six in a rallycross build."

Another Carrera RS 2.7 replaced the ill-fated example, but was eventually bought by "a Chinese accountant who I accompanied on a terrifying test drive not far from where I came unstuck on the A1." The buyer was studying in the UK and took the car back to China with him, but not before replacing his new Porsche's Blood Orange paintwork with white. "In all my years on the road, that test drive was the only time I've asked a driver to pull over and let me take the controls," Vic says, a grave look spread across his face. For a man who has always driven his Porsches hard in all environments, including regular track days, we sense he must have felt in real danger to take such drastic action. Perhaps he was right to exercise caution? After all, his early Porsche history wasn't exactly without its problems, a theme reinforced by the orange RS's successor. "I soon owned a black 911 E 2.4. It was in a dreadful state by the time my name appeared on its logbook, but I was carefully working my way through the car when it was on the receiving end of a whack during the commute to work," he sighs.

At this point, with such a run of bad luck, many would have been tempted to shift their allegiance to another

Above 2.2-litre S joins a long list of amazing air-cooled 911s Vic has owned over the course of five decades

Above Man and machine in perfect harmony following the Porsche's extensive restoration, with all mechanical work taken care of by Steve Winter at JAZ

Below Engine, gearbox and ancillaries were being stored in a garden shed

marque. Vic admits he did flirt with the idea of Ferrari ownership, but he persevered with Porsche, working his way through a Carrera 3.0 (transmission problems) and then headfirst into the Turbo era, buying one of the final three-litre right-hand drive 930s and piling on an impressive 213k miles ("all on the same engine and, surprisingly, all without even the top end being rebuilt") until, early one morning, one of the force-fed flat-six's connecting rods made a dash for freedom through the unsuspecting engine case.

By the mid-1990s, if you'd have cut Vic down the middle, you would have found the Porsche crest running through him, which is one of the reasons a friend invited our man to Porsche Centre Reading to evaluate the then new 993. "I was totally smitten," Vic gasps. "I was never much taken with the 964, but after experiencing time at the wheel of a 993, I knew I had to own one." His now-fixed 930 was subsequently traded in for a Midnight Blue 993 Carrera ("the only new Porsche I've owned"), which he kept for eighteen months before selling up in order to obtain a left-hand drive 1974 Carrera RS 3.0, arguably the perfect air-cooled 911 for a man who takes great pride in "really driving these cars" and spent as much time as he could participating in open track days.

For most Porschephiles, this string of 911s alone represents a dream motoring history, yet many more air-cooled gems have been and gone from Chez Cohen over the years — Vic has owned a 993 Carrera RS, GT2-badged variants of the final air-cooled 911, a 356 Speedster and even an oh-so-eighties flat-nosed 930, to

name just a few of his standout rides. He is, however, keen to highlight how most of his Porsches were bought and sold long before the values of air-cooled classics skyrocketed. "I guess you could say I'm the guy who was lucky enough to own these cars when it was relatively affordable to do so!" he chuckles. All of this begs a simple question: why Porsche? "Put simply, it all comes down to the enormous satisfaction you get driving an air-cooled 911, not least at the race circuit. These cars are quite unlike any other, they're massively capable sports cars and, even though I'm no mechanic, I love how welcoming the engineering of an old Porsche is to even the most inexperienced of enthusiasts," he replies. Not that he needs to worry about finding anyone to take care of his 911s — Vic has always had a great relationship with Steve Winter, proprietor of St Albans-based JAZ Porsche, established in the early 1990s with the sole purpose of making Zuffenhausen's output continue to perform as it should. Thirty years later, nothing has changed, except for the fact JAZ now enjoys a hard-earned reputation for exceptional attention to detail, whether working on the oldest or newest of Stuttgart's finest. Needless to say, Vic had no hesitation in partnering with Steve in co-ownership of the beautiful blue 911 S pictured across these pages.

THE PROCESS WASN'T RUSHED, EVEN THOUGH VIC'S INFECTIOUS ENTHUSIASM WAS GETTING THE BETTER OF HIM

Bought in 2012 as a rolling shell and boxes of accompanying parts, the 2.2-litre restoration-in-wating had been owned by its seller for three decades, during which time he'd enjoyed plenty of track time in his pride

Above "Kor" is the expression we used when we first saw this stunning Porsche, too!

Above and below Everything appointed during the rebuild is either fully refurbished or totally new, resulting in a factory fresh finish

and joy. "It was a sorry state," Vic tell us. "The bodywork was horrendous. The car wasn't even rolling on wheels — we had to put it on a dolly. Worse still, the engine, gearbox and all ancillaries were in a shed at the bottom of the seller's mother's garden! As you'd expect, we made a full inventory of everything acquired. Naturally, we were relieved to find most basic parts were present and correct, but many items were unusable, such as the dash top and oil cooler, which were useless."

YOU'RE THE EXPERT

Steve is a time-served Porsche specialist more than capable of taking care of work needed to transform a car in questionable mechanical condition from tired ride to factory fresh. So it proved with the 911 S across a two-year period, when he juggled the restoration around the demands of JAZ customer work. During this time, the mechanical fuel injection pump was sent to Germany for refurbishment and "whatever needed renewing was replaced with new parts, with the build remaining true to the original car, even down to the writing on the heads of suspension bolts."

The body was blasted to reveal its true state, after which it made its way to Shoeburyness, the home of award-winning automotive body and paint specialist, Sportwagen, where company director, Bruce Cooper, placed the 911's shell on a jig and worked his way through every panel, sorting corrosion as he went. Understandably, the process wasn't rushed, even though Vic's infectious enthusiasm was getting the better of him. "The biggest challenge faced with this project was simply the length of time it took to hit the road in the

finished Porsche," he smiles. His patience would be rewarded in spades after Bruce finished the bodywork and Steve was done equipping the car with its rebuilt flat-six, transmission and suspension.

The engine itself follows standard specification, save for a slightly modified cam profile and electronic ignition, making the car, frankly, more usable in modern traffic. A thicker anti-roll bar and new front wishbones feature, though the original Koni dampers have been refurbished. Carrera 3.2 calipers sit where the earlier anchors once lived, while the factory steering rack has been restored and reinstated, as have the electrics and the fuel tank. A Dansk silencer and new stainless heat exchangers reside at the rear. "The custom cam profile has made a significant improvement to driveability," Vic says, keen to impress upon us how relatively minor changes have mad a big difference to the way this car behaves. "There's not much going on below 2,500rpm, but thereafter, this 911 feels jet-propelled all the way up to the 7,300rpm redline." It's a comfortable car, too, thanks to an interior featuring figure-hugging seats trimmed in perforated soft leather methodically prepared by Garry Hall at Porsche trim shop, Classic FX, and carrying Vic for twelve-thousand trouble-free miles since completion of the restoration.

What's next? "That's a good question," he muses. "This beautiful 911 is performing brilliantly and I really can't think what I'd like to replace it with. I'm an older driver now, meaning I'm not looking to take this particular Porsche to a track. Besides, I've downsized my home and my new garage is unable to accommodate a bigger 911, such as the 997 GT3 RS I owned a short while ago." He concludes by telling us he removes the wheels of his cars at least twice a year, specifically for the purpose of cleaning the inner arches, thereby ensuring the underside and other hidden areas of bodywork remain as perfectly presented as the gleaming panels on show.

"This 911 really is as clean underneath as it is everywhere else," he says, exactly fifty years on from his first Porsche purchase. We don't doubt you, Vic. Keep up the good work! **CP**

Above Extra poke in the higher rev range comes from a sightly modified cam profile

90 YEARS ENGINEERING

PORSCHE POWERHOUSE

Over the years, Porsche Engineering has been commissioned with many ambitious projects inside and outside of the automotive sphere. Here are just a few of Stuttgart's greatest hits…

Words **Shane O'Donoghue and Dan Furr** Photography **Porsche, RM Sotheby's and General Motors**

Above 1939 Type 64 was offered at RM Sotheby's 2019 Monterey Sale with a lower estimate of $19,000,000

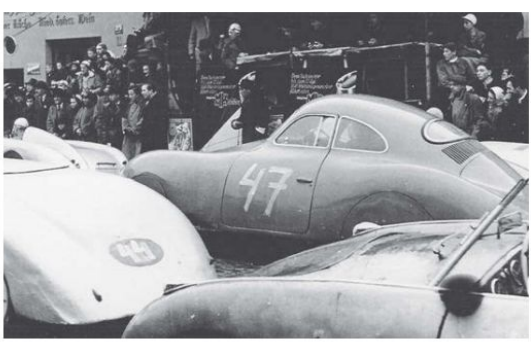
Experience gained in the early years of Porsche Engineering — under the leadership of Ferdinand Porsche — effectively enabled the company to launch its own sports car business, starting with the 356, in 1948. Ferdinand passed away in 1951, thereby never getting to see the firm's global domination of the premium automotive market, and though the company bearing his name worked under contract on various projects for third parties while the 356 was in development, it didn't lose focus of its own model range and motorsport programme.

Apart from the Volkswagen projects documented elsewhere in this issue of *Classic Porsche*, Porsche's engineering office, which had moved to the Zuffenhausen district of Stuttgart in 1938, was working on numerous other development assignments for the automotive industry. Under a contract concluded with Daimler-Benz AG, for example, Porsche not only developed technical engine components for the Mercedes Silberpfeile (Silver Arrows) Grand Prix cars, but also worked on the Type 80 World Speed Record Car from 1937 to 1939. Yet another project was the Type 110 compact tractor for farm use, developed on behalf of the *Deutsche Arbeitsfront* (*DAF, German Workers Front*) with its air-cooled two-cylinder power unit, setting the foundation for the subsequent 'People's Tractor' and the Porsche-Diesel tractors built after the war.

The Type 64 race car was prepared in 1938 for the for the long-distance 1939 Berlin-Rome race and is widely acknowledged as the original ancestor of all subsequent sports cars to follow from Porsche. Based on the Volkswagen Type 60, the Type 64 was seen by the *Kraft durch Freude* (*KdF, Strength through Joy*) movement as the ideal model for promoting sales of the Volkswagen, now re-named the KdF Wagen, later to become known all around the world as the Beetle. The Type 64 featured Volkswagen Type 1 underpinnings and a 32bhp flat-four engine. Aircraft technology was used to rivet together the chassis and alloy body, complete with its wheel-covering removable panels. Sadly, just as the first of three cars was finished, the outbreak of war put paid to the project. Or so it was assumed.

The young Ferry Porsche recognised the value in secretly continuing to develop the two additional Type 64s as a testbed for Porsche's first sports car. Consequently, the second Type 64 was completed in December 1939 and the third, using the chassis of the first car, which had been damaged following an accident with the Managing Director of Volkswagen at the wheel, by June 1940. This third Type 64 was retained as a personal family car and driven extensively by Ferry and Ferdinand Porsche during the war years.

Below Type 64 takes on the Korneuburg road race, Austria, April 6th 1952



In 1948, Porsche demonstrated the mid-engined 356 No.1 on public roads in Innsbruck. The sole surviving Type 64 was by its side, following restoration work carried out by a young Pinin Farina in Turin a year earlier. Austrian privateer driver, Otto Mathé, was asked to complete demonstration laps in the older car and immediately fell in love with it. He became the Type 64's new owner in 1949 and enjoyed a relatively successful racing career with the car in the 1950s. He kept the Type 64 for the remainder of his life, before passing away in 1995.

In 1997, Mathé's Type 64 changed hands for just the second time in six decades and appeared at a small number of historic racing events with its third owner, Dr. Thomas Gruber of Vienna. Outings included Goodwood and the Austrian Ennstal Classic. "Without the Type 64, there would be no 356, no 550, no 911," says Marcus Görig, classic car specialist at RM Sotheby's, the auction house charged with finding a new home for the car in 2019. "This is Porsche's origin story, the car that birthed the company's legend!"

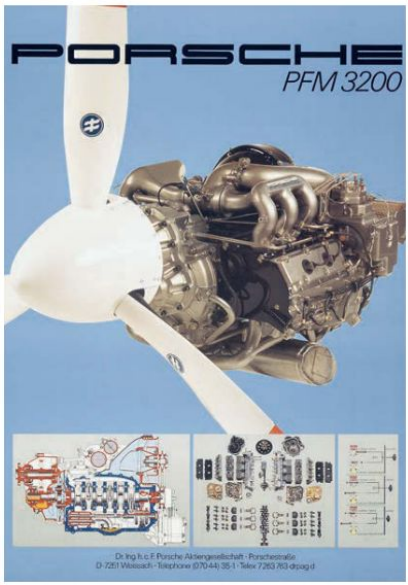
When the 1939 Berlin-Rome road race was cancelled, the Porsche Engineering office promptly switched its attention to projects intended for military use. Apart from the Type 81 Volkswagen Kastenwagen, the company (re-established in late 1937 as Porsche KG) developed the Type 62 KdF Offroader, the Type 82 Volkswagen Kübelwagen, the all-wheel-drive Type 87 and the Type 166 VW Schwimmwagen amphibian car. Then, at the end of 1939, Porsche's engineering office was requested by the German Army to develop a medium-weight battle tank, but work on this model was discontinued mid-design due to the need for much heavier hardware.

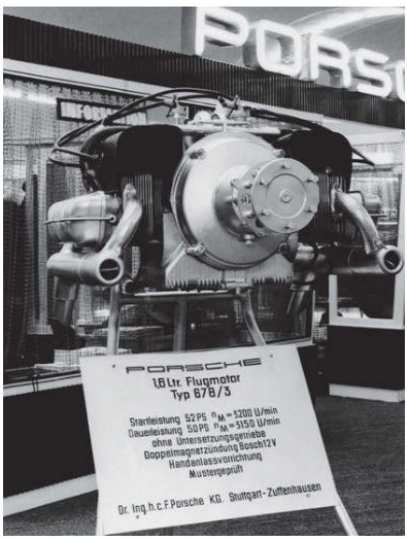
When developing the Tank 101 'Tiger', Porsche submitted its bid for a tender organised by the Army Armament Authority for the construction of a tank in the weight category above fifty tonnes. And indeed, in 1942, Ferdinand Porsche received the assignment to build a heavy armoured car to become known as the Tank 205 'Maus', driven by a hybrid combustion engine and electrical power system and weighing a total of 189 tonnes following completion of design and drafts. Ultimately, however, only two prototypes were built and the vehicle was never able to enter battle. Later, following a fresh government assignment in 1958, Porsche Engineering started work on the Type 814 Leopard, a tank entering production in 1961 with a total of 2,400 units subsequently put into operation by the German armed forces. Development continued until 1966.

As is plain to see, development remained an important

Above The UFO-like Type 64 at the International Austrian Alpine road race, held June 24th and 25th 1950

Below The car also competed at the Salzburg road race, Austria, September 7th 1952





Above All-wheel drive Volkswagen Schwimmwagen (Porsche Type 166) being tested in 1942

Top right The air-cooled six-cylinder PFM 3200 aircraft engine from 1981

Right 1959 52hp 1.6-litre Type 678/3 aircraft engine

Bottom right In cooperation with Airbus between 1981 and 1984, Porsche engineers at Weissach worked on the design of ergonomic cockpit layout for passenger aircraft

Porsche stronghold after 1945. Indeed, following the war, the Porsche Engineering office, which in the meantime had moved to the Austrian town of Gmünd in Carinthia, again competed for new orders from the automotive industry. To begin with, however, the company was only able to develop and sell water turbines, cable winches, ski-lifts, mowing rods and various tractors based on the original People's Tractor, which was now marketed for the first time under the name Porsche.

As we now know, things had changed by 1961, when 356 production was in full swing and Ferry Porsche oversaw building of the Weissach Development Centre, initially used only for the benefit of Porsche's own production vehicles and race cars. A decade later, the development division within Porsche's growing engineering, test and design departments moved into the rapidly expanding Weissach facility, ushering in a new era in Porsche Engineering. Of course, away from the work mentioned here, there are many more Porsche Engineering projects we could fill these pages with — the Lada Samara, SEAT Ibiza, the Longlife Car Research Project, the abandoned Volkswagen EA 425 (successor to the 914, ultimately realised as the 924), the ORBIT firefighting system, the Studebaker Type 542 and the Swift modular ambulance, to name but a few. We'll undoubtedly address these and more in future issues of *Classic Porsche*. In the meantime, here are a few standout Porsche Engineering projects you might not know about.

AIRCRAFT ENGINES AND FLIGHT DECKS

In 1959, Porsche presented a range of aircraft engines at the German Industrial Fair in Hanover. Engine outputs ranged from the 65bhp Type 678/1 to the Type 678/4, which developed 75bhp as a base model. Later, in 1981, Porsche adapted the 911's air-cooled flat-six to create aircraft engine PFM 3200, conceived to power light aircraft. The same year, Porsche unveiled a special project for Airbus — design of the A310 flight deck, which remained in development until 1984. Airbus approached Porsche with a preliminary design study and commissioned the company to develop it further. The

brief was succinct — Porsche was tasked with creating the optimum control environment for one of the world's most advanced commercial passenger aircraft.

The most obvious innovation was the use of read-out screens in place of analogue instruments, technology which soon became the norm in the aeroplane industry. Nonetheless, in a magazine advert of the time, Porsche likened its approach to the Airbus cockpit to that of the 911's cabin. "It is a machine you feel at one with immediately," the text read. "Seating is anatomically shaped to enhance vehicle control and comfort. Instrumentation is clear and uncluttered, providing, at a glance, essential performance information. Visibility is excellent. Gimmickry noticeably absent."

Porsche claimed the ergonomically arranged control units — and even the colour scheme —helped reduce stress and keep fatigue for pilots to a minimum. It also used the advertisement to promote its engineering services, pointing out how Weissach, with over 1,700 specialist design engineers on site, had developed into a "self-sufficient experimental complex that today, through a myriad of different projects for governments and major clients, shapes the future of transportation."

LINDE FORKLIFTS

Porsche wasn't working on only aircraft, military and automotive projects. Following detailed technical work on slewing gear drives and chain drives for the Linde forklift company, Porsche was commissioned to come up with a new characteristic look for the firm's vehicles in 1982. "The very first cooperation project was the H30 BR351, a styling project with the aim of transforming a pure work machine into a vehicle with a more pleasing appearance," remembers Fritz Müller, former key account manager at Porsche Engineering, not oblivious to similarities with Porsche-Diesel tractors, which offer just as much form as function. "Since the beginning of the Linde project in 1982, there has been a framework contract between our two companies, which is still in force today," he adds. We're not surprised — Linde forklifts have coined more than twenty vehicle design awards since Porsche's involvement.

Above The 1937 Type 110 tractor, with air-cooled two-cylinder engine, formed the basis for the subsequent 'Volkstraktor' and the Porsche-Diesel tractors produced after the war

Below, clockwise from left Linde forklift, SAVE ambulance, ORBIT fire truck

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Above Niki Lauda won the 1984 Formula One Championship, driving the McLaren-TAG-Porsche MP4/2 to victory by just half a point

Udo Herrmann, head of pre-development at Linde Material Handling, also commented on the relationship. "Analogous to the performance of a Porsche on the road, our forklifts are also high-performance vehicles moving loads quickly — and above all, safely — from one place to another. Linde and Porsche share high quality standards and each offers a unique product range. As with Porsche, the special design of our forklifts triggers emotions and reflects the values of our company. Each vehicle's high performance must be clearly visible. In other words, the high quality, sturdiness and solidity must be given clear expression. Just as is true of Porsche, we do not add artistic touches without substance. In particular, I hope Linde will continue to benefit from an impetus for trends and technical topics from the automotive sector that can be transferred to our industry," he continued. "I'm thinking of topics such as increasing electrification, communication tools and digital user interface design. These are all becoming increasingly important for industrial trucks — it's an area in which the automotive sector is usually a generation ahead. And design language will continue to play an important role."

FORMULA ONE ENGINES

Joe Public is unlikely to know about the majority of projects undertaken by Porsche Engineering, but the high-profile world of Formula One brought the Porsche name front and centre for a period of massive success in the mid-1980s. Following a few years without a race win, the McLaren F1 team was taken over by Ron Dennis in 1981, with esteemed race car designer, John Barnard, at his side. That year, the latter revolutionised the sport with his innovative carbon-fibre composite monocoque chassis, the McLaren MP4/1, which went on to secure several podium finishes. In 1982, John Watson finished third in the drivers' championship, while McLaren finished second overall in season-end constructor standings. MP4/1 power was delivered by the tried-and-tested Cosworth DFV, a naturally aspirated V8, competing with up-and-coming turbocharged engines from Ferrari, BMW and Renault.

Dennis and Barnard decided they needed a bespoke turbocharged engine in order to remain competitive. The unit they envisaged needed to suit the carbon chassis and the packaging requirements of ground-effect aerodynamics. Porsche had already proven its expertise in this field, successfully developing and campaigning turbocharged race engines for international motorsport, as demonstrated by the force-fed twelve-cylinder 917/30 Can-Am. McLaren saw Porsche as the perfect partner.

The creation of a completely new F1 engine, using cutting-edge turbocharging technology, was going to cost a small fortune, which is why Ron Dennis set about looking for funding before Porsche was commissioned. He approached Mansour Ojjeh, president of Techniques D'Avant-Garde (TAG), a private holdings company (which sponsored the Williams F1 team at the time) and convinced him to become a key partner in the project. Ojjeh agreed to fund the engine's development on the condition it was badged as a TAG product. It's believed the Porsche engineering team, led by Hans Mezger, initially favoured a boxer layout. Not only had Porsche a vast amount of expertise with this configuration, but it would mean a lower centre of gravity and relatively easy packaging of the turbochargers and ancillaries. Barnard, however, didn't want a wide engine, complaining about it compromising aerodynamics, and so a boxer was ruled out. He also wanted the engine to be a stressed member, bolted directly to the chassis, which deemed a straight-four or straight-six as an alternative entirely unsuitable. A V8, meanwhile, would be physically too large and come with high levels of internal friction.

Facing page The Porsche-powered Footwork Arrows Formula One car at the 1991 Phoenix Grand Prix

Top 1986 Monaco Grand Prix, Keke Rosberg at the wheel of the no.2 McLaren

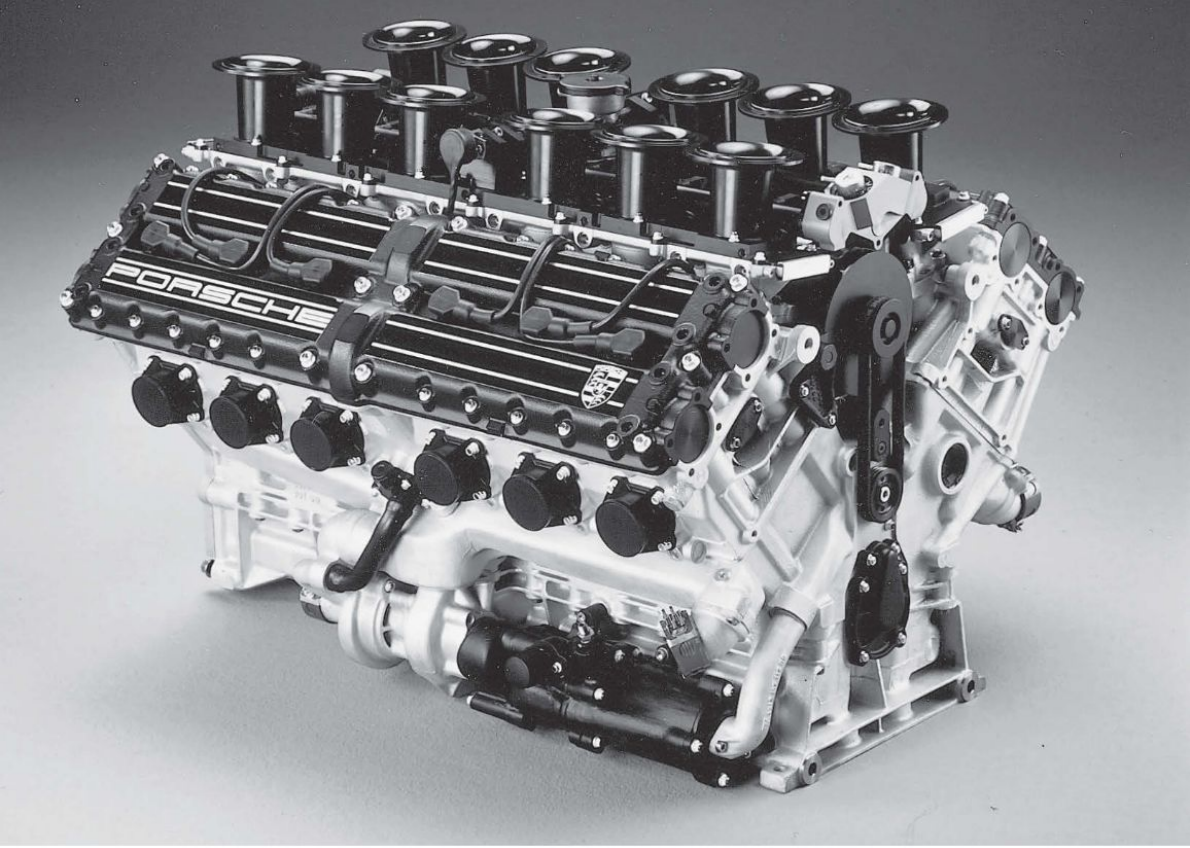
Above McLaren-TAG-Porsche, during testing at Weissach development centre

Top right The famous TAG-branded Porsche engine for the McLaren Formula One team

An eighty-degree V6 was decided upon and Porsche opted for twin-turbocharging. Regulations stipulated a maximum swept capacity of 1,500 cubic centimetres, leading Porsche to work with a wide bore of 82 millimetres and a short stroke of 47 millimetres, a ratio suitable for high revs. The resulting engine hit 700bhp at a screaming 11,500rpm in its initial iteration, nearly 200bhp more than the Cosworth unit was capable of. Though the TAG-Porsche engine was designed to fit into the 1984 McLaren MP4/2, Niki Lauda approached team title sponsor, Marlboro, without McLaren's knowledge, complaining about the risk of using such a radically redesigned car. This effectively forced the team to redesign the 1983 car to accommodate the as yet unproven new engine. The result was the MP4/1E, which was unreliable, though it did prove its speed at the final race of the season before electrical failure.

Nonetheless, McLaren and Porsche were fully prepared for the 1984 season, when the MP4/2 won its debut Grand Prix in Brazil. At the hands of Alain Prost and Niki Lauda, the new car completely dominated the season, taking twelve victories from the sixteen races. Interestingly, McLaren was the only top team not running special qualifying engines, though Porsche did up its maximum output from a race-safe 650bhp figure to 800bhp for qualifying. Engines used by rival teams, however, topped 1,000bhp — the McLaren was rarely in pole position (just twice in the 1984 season), but the Porsche engine proved to be hugely reliable, relatively easy to drive, comparatively frugal and, crucially, didn't punish the host car's tyres.

Lauda narrowly took the 1984 drivers' championship from Prost, while McLaren utterly annihilated its competitors in the constructors' championship. For 1985, Porsche upped the engine's performance while enhancing its fuel economy. Again, the unit was a massive success. Prost took the drivers' trophy that year and McLaren beat Ferrari to the constructors' championship. In 1986, Prost again won, but other teams were beginning to catch up in the performance stakes and, at the end of 1987, TAG withdrew funding, bringing an end to this chapter in Porsche's engineering



and motorsport story. Of course, as a constructor, Porsche exited F1 in the mid-1960s and can count just one classified overall race win to its name, but the dissolution of the McLaren partnership didn't signal the end of the Stuttgart brand's involvement in Grand Prix racing. Porsche returned to F1 in 1991 with the Mezger-designed 3.5-litre Type 3512 engine commissioned by the Footwork Arrows team. Regrettable weight, reliability and power issues — evoking memories of the uncompetitive Porsche Type 787 F1 car from three decades earlier — meant the V12's performance on the international stage was less than Stuttgart's finest hour.

A 3.5-litre V10 was secretly developed in response to the 3512's poor competitive qualities, but reputational damage was already done. At least Porsche was able to make good use of the lesser-cylindered lump by increasing its displacement to 5.7-litres and chucking it into the guts of the Carrera GT supercar. The engine was also intended to power the Porsche LMP2000 (also known as the 9R3) Le Mans prototype, a build developed in 1998, but cancelled before it was given the opportunity to race.

Test drivers, Alan McNish and Bob Wollek, provided Porsche with positive feedback, but the LMP2000 project was ditched in 1999, with rumour rife the decision to cancel was initiated by Volkswagen Group boss, Ferdinand Piëch, to avoid inhibiting the Audi R8 from going on to achieve success at Sarthe and potentially damaging the R8's anticipated high number of showroom sales. LMP2000 engineers were moved onto the then fresh Cayenne SUV project.

Despite the lack of fourth consecutive title for McLaren in 1987, Porsche's dominance as an F1 engine supplier shouldn't be underestimated. The statistics speak for themselves. For example, Porsche engines enjoyed an amazing twenty-five Grand Prix victories from 1984 through to the close of the 1987 season. Then there's the trio of drivers' championship titles in 1984, 1985 and 1986. Two constructors' titles were achieved during the same period. Admittedly, it wasn't Porsche's

Above The twelve-cylinder Arrows Formula 1 engine, made of aluminium and magnesium, with central drive and displacement of 3.5 litres, proved not to be competitive

Below Mercedes-Benz 500 E was hand-built by Porsche

name plastered down the side of the McLarens competing, but considering the impact of the Mezger-engineered, TAG-branded engines pushing each car to victory, perhaps it should have been?!

MERCEDES-BENZ W124 500 E

The W124 Mercedes-Benz, launched in 1984, was the first official E-Class (following a rebranding in 1993). Mercedes claims the model was designed from the start with the possibility of featuring an eight-cylinder engine, but when it came to developing such a car — the 500 E, or Type 2758, according to Porsche's own numbering system — for production, its own engineering teams were swamped with work for the forthcoming new generations of SL and S-Class. Hence, in 1987, Mercedes handed the 500 E project over to Porsche, the intention being for Porsche to design and develop the car Mercedes would then manufacture.

Considerable modifications to the chassis and drivetrain were carried out by Porsche, but it was all subtly hidden behind bodywork only slightly different to that of any other W124 saloon. The changes were needed to accommodate the five-litre V8 engine (designated M119), as used in the also-new R129 500 SL. Incidentally, this engine, loaded with twin turbochargers, also powered the Sauber-Mercedes C9 to win the 1989 World Sports Car Championship and the 24 Hours of Le Mans, not that Porsche had anything to do with these achievements. In naturally aspirated guise, the V8 was altered for its use in the 500 E, with a lower block and the first use of an electronically controlled Bosch LH-Jetronic intake-manifold petrol injection system with heated wire mass air flow sensor in a Mercedes-Benz. The car's vital stats were 322bhp at 5,700rpm and 354lb-ft torque at 3,900rpm. Mercedes limited top speed to 155mph, though the 0-62mph time was quoted as being just 5.9 seconds.

To cope with this performance, Porsche made many detail changes to the W124, even moving the battery to the rear of the car to enhance the weight distribution. The 500 E's uprated brakes came from the SL and it was fitted with electronic traction control as standard, too. Meanwhile, the ride height was dropped a considerable twenty-three millimetres, the front spoiler was subtly restyled for aerodynamic purposes and the wheel arches (front and rear) were flared to accommodate 225/55R/16 tyres.

Mercedes revealed the 500 E at the 1990 Paris Motor Show and, while its appearance was restrained, its technical specification grabbed the attention of the assembled enthusiasts and motoring journalists. All this came at a crucial time for Porsche — our favourite manufacturer was in severe financial turmoil at the turn of the decade and its production lines were hugely underutilised. Luckily for Porsche, the wider bodywork the company designed for the 500 E meant huge investment would need to be made at the Mercedes assembly plant in Sindelfingen to accommodate production of the new car — it was discovered the 500 E failed to fit through three points of the established W124 assembly line. For these reasons and more, it made more sense for Mercedes to commission Porsche to take care of assembly at Zuffenhausen. Bizarrely, the vehicles went back and forth between the two locations — the bodies were hand-assembled by Porsche, sent back to Mercedes for painting, then returned to Porsche for final assembly with Mercedes-supplied drivetrains and running gear. The finished cars then had to be transported back to Mercedes for distribution. This process took eighteen days per car.

The 400 E was launched in 1991, using the Porsche chassis and a 4.2-litre V8 from the S-Class. This smaller-engined W124 did without the wider bodywork, meaning it could be manufactured entirely by Mercedes. Later,

Below The wide-bodied, Porsche-built W124 is one of the era's legendary German super saloons, boasting performance a boxy saloon should have no right to plant to the asphalt!

Above The RS2 Avant and the 964 are cut from the same cloth and both are highly desirable today

following changeover to the new nomenclature for all Mercedes products in 1993, the 500 E was reborn as the 'facelifted' E 500. The next year, AMG fitted a six-litre 381bhp M119 V8 to 500 E architecture, resulting in the E 60 AMG. At the same time, Porsche assembled the E 500 Limited, a 951-unit variant (originally intended to be 'limited' to five hundred units) carrying model-specific trim, a lower ride height, seventeen-inch EVO II alloys and the option of an E 60 AMG engine. A surviving E 500 Limited is currently on display at the Porsche Museum in Zuffenhausen.

All 500 Es and E 500s were right-hand drive, even for the UK domestic market, where twenty-nine units were sold new. Celebrity owners include comic actor, Rowan Atkinson. In total, 10,479 examples were made by Porsche before the end of the W124's production run. This figure includes 120 runout builds offered as 'last request' cars for Mercedes priority customers in 1995. These W124s were assembled alongside the Audi RS2 sport wagon, a project lined up at Porsche's production plant to coincide with discontinuation of the E 500.

AUDI RS2 AVANT

Following a long period of under-performing dealership sales and corresponding depressed manufacturing activity, Porsche's vehicle assembly staff found themselves very busy with Porsche Engineering contract work in the mid-1990s. A key project was production of the Audi RS2 Avant, which went into production before the last Mercedes E 500 rolled out of Zuffenhausen. It's important to note the RS2 Avant was the first-ever Audi RS model and the brand's first high-performance estate, too. Its development was very much a collaborative effort between Audi and Porsche, but production was carried out by the latter. The aim was to improve Audi's image, restore its sporting credentials and give chase to the BMW M3.

Based on the B4 Audi 80 Avant, the RS2 featured full-time Quattro four-wheel drive with an open front differential, a non-locking Torsen centre differential and an electromechanical locking rear differential which could be activated by the driver. Under the bonnet was a highly modified example of an existing turbocharged Audi five-cylinder engine. The 2.2-litre powerplant used four valves per cylinder and a double overhead camshaft arrangement as standard, but Porsche changed the camshaft profiles for higher performance. Porsche also swapped the turbocharger for a larger unit, along with an uprated intercooler. To make the most of all this equipment, the induction and exhaust systems were redesigned, higher-flow fuel injectors were fitted and a new Bosch engine control unit and software calibration joined the party. The end result was 311bhp at 6,500rpm and 302lb-ft torque at 3,000rpm. The dash to 62mph from rest was quoted as being despatched in 4.8 seconds, while top speed was 163mph. Porsche also worked on the RS2's braking and chassis systems, lowering the car on new springs and dampers by a significant forty millimetres. Cast aluminium was used in the suspension to replace steel control arms. Bespoke Brembo brake calipers were drafted in and rounding out the changes was a set of five-spoke seventeen-

Below Red reflector fill panel is just one of many styling elements paying more than a passing nod to Porsche

Above Shared parentage is clear to see between the RS2, the 964 and 993, with the Audi's front bumper ducts, 993 integrated lights, 964 wheels and Cup door mirrors being tell-tale signs

inch alloys from the 964, wrapped in high-performance Dunlop 245/40ZR/17 tyres. Though the centre caps of the wheels bore the four-ringed Audi badge, the Porsche name was emblazoned across the brake calipers. A stylised RS2 badge was attached to the rear and front of the car, as well as on its steering wheel. A new red reflector panel joined the rear lights of the Audi in a nod to the back end of the contemporary 911, while the RS2 also featured 993 door mirrors and bumpers with styling elements inherited from the same air-cooled Porsche, not least its integrated light units.

OPEL/VAUXHALL ZAFIRA

Family life doesn't have to mean kids get all the toys. This is exactly the train of thought the performance motoring bods at Opel adopted when they commissioned Porsche Engineering to develop the Zafira compact MPV, presented in concept form at the 1997 Frankfurt Auto Show, entering series production in 1999 and finishing third in the European Car of the Year in 2000, a contest Porsche won with the 928 in 1978. To date, the iconic 'land shark' is the only sports car to have won the competition, an achievement regularly cited as proof of how far ahead of its time the V8-powered grand tourer was when compared to offerings from rival manufacturers.

Turning the volume up to eleven, the OPC/VXR-badged Zafira was the world's fastest production people carrier when released into the wild in 2005, hot on the heels of the discontinued Zafira GSi, itself a big hit on launch in 2001. The seven-seat Zafira OPC/VXR shared the same turbocharged two-litre Z20LEH powerplant as the hugely successful Astra H OPC/VXR hot hatch, producing 237bhp, 236lb-ft torque and offering a sprint to 62mph from rest in just 7.2 seconds. This was the familiar compact MPV format, but presented in an aggressive-looking package with added attitude — astonishing pace for what was essentially a minivan. Motoring hacks weren't sure which drivers were in need of such a vehicle, but light, spacious, comfortable and clever, the Zafira OPC/VXR featured a Getrag M32 six-speed gearbox, a lowered right height, ESP, electronically controlled independent suspension, 321mm front brakes and pretty much all the styling and comfort found on the other models in Opel/Vauxhall's OPC/VXR range: honeycomb sports grilles, extended side skirts, aggressive bumpers, lashings of leather and a prominent roof spoiler to ensure the Zafira OPC/VXR stood out in a crowded car park. This wasn't a Porsche, but its basic design came from Porsche Engineering and the Biltz/Griffin-badged more-door tried hard to exhibit Stuttgart spirit.

The Zafira OPC/VXR's cargo carrying capacity — and, it must be said, overall appearance — shared more in common with the turbocharged 2.8-litre V6 Vectra OPC/VXR estate than the smaller Astra H OPC/VXR, but balancing bags of luggage space with class-leading pace ensured buyers experienced a huge dose of driver excitement without losing one ounce of what continues to make the Zafira such a brilliant people carrier. In designing the Zafira, Porsche proved that having a family doesn't mean you stop having a life.

Arguably Porsche Engineering's most famous project in recent years, the RS2 Avant was assembled in Zuffenhausen for just over a year (from 1994 to 1995), resulting in nearly 3,000 examples. The Zafira arrived four years later. This was an auspicious time for air-cooled Porsches, of course — assembly of the RS2 coincided with introduction of the last-of-the-breed 993 and the Zafira's development occurred at the same time as introduction of the 996-generation 911 and the 986 Boxster. Even so, the projects Porsche Engineering undertook during the gestation, development and, ultimately, demise of its own air-cooled cars have undoubtedly contributed enormously to the automotive world at large, not to mention its own range of models. Ninety years since Ferdinand Porsche opened his engineering and design studio in Stuttgart, it continues its fine work to this day. **CP**

Below Porsche designed the Opel/Vauxhall Zafira, which, in OPC/VXR trim, went on to become the world's fastest production people carrier

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PATTERN OF ATTRACTION

Daring to be different, Dave Goodwin treated his modified Guards Red 964 Carrera 2 to a modern interpretation of a classic Porsche interior…

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

Above RS styling influences the exterior, which features bumpers modified to accept shortened registration plates and HIDs with 356 lenses

Those of us lucky enough to contribute to *Classic Porsche* magazine get to see some of the very best air-cooled cars out there. From insanely good road car restorations to rare historic racers, hot rods and everything in between, we're privileged to be able to experience these cars and share them with you in our pages. What's so special about a Guards Red 1989 964 Carrera 2, then? It's hardly the most sought after of all classic Porsches. In fact, you don't need to travel too far back in time for the 964 to be considered the runt of the 911 litter. With a new generation of enthusiasts entering the classic Porsche scene, however, the 964 found favour with a fresh pool of buyers, primarily those who proudly pinned posters of the G-series successor on their bedroom walls as teenagers. And, of course, when you could acquire a 964 for a price much lower than the model commands today, it provided the perfect platform for a 911 restomod project. Many of these builds went on to achieve high-profile recognition, thereby further raising the 964's profile. Big-budget backdates, wild restomods — the 964 had come of age.

None of the 964-based projects of recent times have captured the imagination of the wider automotive world than those produced by Singer. Ignoring specifics regarding the design and technology — and eye-watering cost — of the brand's builds, at their core, these reimagined 911s offer something *different*. As enthusiasts, this is something we can all appreciate, even if the finished Porsche isn't to our personal tastes. After all, the world would be a very boring place if we all owned the same cars built to the same specification.

It's this desire to present something unconventional, but not jarring in its presentation, which leads many independent marque specialists to experiment with new ideas, especially when it comes to company demonstration vehicles, serving as a rolling showcase of what their creators are capable of. It's this train of thought which leads us to the radiant red 964 on the pages before you.

PAIRED WITH 993 REAR SEATS, THE BIG-BOLSTERED RECAROS WERE A SOLID STARTING POINT FOR A CUSTOM CABIN

"I bought the car in November 2020," says Dave Goodwin, founder of Dave the Trimmer, the Bedfordshire-based automotive interior specialist responsible for some of the very best Porsche retrims we've seen in recent times. "I'd wanted a 964 for a very long time and spotted this car advertised as available for purchase from Bure Valley Classics in Norfolk," he adds. A well-known car in 964 circles, the immaculately presented Porsche had been subjected to an engine rebuild at Strasse, a gearbox overhaul at Ninemeister and a major service and new clutch at Heritage Autowerks, the official UK

Above and below Alcantara covers almost everything inside the car, from the seats to the dash dial rings

service centre for Singer. A large folder documenting comprehensive maintenance history (chiefly Official Porsche Centres in Wilmslow, Chester and Leeds), all past MOT certificates and, importantly, invoices for all work carried out, including more than three hundred hours on body and paintwork, ticked many buyer boxes, but the car remained with Bure Valley Classics for much longer than those in the know anticipated. Why? "It was the interior," Dave laughs. "It looked as though it had been snowing in the cabin!"

WINTER WONDERLAND

It's important to note the car had been retrimmed in vanilla Nappa soft leather to a high standard, but with the exception of the lower dashboard (and its 993 knee roll), everything was unusually super-light in colour, including the dash top roll. "The previous owner asked me to quote for the work, but ended up using a different supplier," Dave shrugs, before confirming the car was in exceptionally good external cosmetic condition. "I knew this 964 had been really well looked after and could see huge potential to do something special with the interior, but on that occasion, it wasn't to be." Then, when the car remained with Bure Valley Classics longer than expected, he recognised a deal could be done. More importantly, in doing so, he'd get a shot at transforming the car's cockpit into something less stark, whilst making use of design elements hitherto unseen.

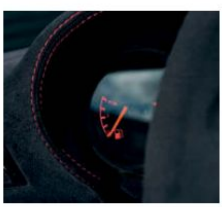
"The interior was very much to the car's previous owner's personal preference and had only recently

been completed, but prospective buyers were faced with the potential for an expensive retrim if they wanted something more subtle. I don't think many people fancy shelling out for a new interior on top of the price of a 964, which is why I suspect the car didn't sell as quickly as expected," Dave continues. "There's no denying the care and attention which had been lavished on this Porsche, though," he adds, citing a wealth of well-considered upgrades, including KW V1 coilovers set to Carrera RS ride height, new Michelin Pilot Sport tyres, a Porsche Technik exhaust with G-pipe, Cup mirrors and wheels, a Clubsport steering wheel, a Steve Wong ECU chipset, rear windscreen wiper delete, de-locked 993 door handles, HID headlights (now with 356 lenses), limited-slip differential, modified bumpers with shortened registration plate recesses, RS brake cooling duct inserts and new rubber seals throughout. Updated in-car entertainment equipment also contributed to what was on offer, with an under-seat subwoofer and a mix of speakers pumping out tunes from a retro head unit.

Beauty, as they say, is in the eye of the beholder. "I don't want people thinking I trashed the interior taking up residence in the car when I bought it!" Dave stresses. "On the contrary, I sold the seats to a fellow 964 owner, who was really pleased with the way they look. I'd already decided to fit Recaro A8 buckets, meaning the vanilla-trimmed parts were of little use to me." Paired with 993 rear seats, the big-bolstered Recaros were a solid starting point for a custom cabin. There was only one problem. "I had no idea what I wanted to do, other than something different," he admits. "I had three weeks of sleepless nights with my brain doing overtime trying to come up with something no other automotive trimmer had previously presented." Fortunately, he had time to play with — almost as soon as he bought the car, he handed it to Autobodykraft in Hockliffe for corrective paintwork, highlighting one of the rear wheel arches and the engine lid as showing small signs of surface corrosion, along with the rear light bowls, which were promptly replaced by classic car restoration company,

Above The car was known to Dave due to him being asked to quote for the car's previous retrim, which took the form of bright vanilla Nappa leather

Below 993 rear seats have been modified to fit alongside the Recaro A8s, while the door cards feature custom billet handles and release catches



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DH Engineering. Then it hit him. "Pasha!" he cries. "I decided upon a classic OEM finish, but displayed in unexpected fashion."

His first experiments involved trying to impress the psychedelic Porsche pattern — originally printed onto fine velour seat coverings and door panels for the 911, 924 and 928 models in the late 1970s — into leather, but no matter how hard he tried, the desired results couldn't be achieved. Laser-cutting into Alcantara, however, was a different story. "We've carried out a fair amount of laser work in the past," Dave explains. "Ordinarily, this technology would be used for creating precise cut-outs in fabrics or leather for door speakers and the like, but when experimenting with different laser temperatures, I realised I could create complex patterns and laser-etch them into Alcantara." The soft, synthetic, suede-like material has become a hugely popular fixture of modern sports car cabins, not least Porsche's recent GTS range of products.

He provided his laser-operating supplier with a metre-square of Pasha fabric from which to take measurements to create bespoke CAD drawings. It was a time-consuming process, not least because few of the pattern's 'blocks' are the same size. Dave also wanted the design to 'fade' toward the front of the seat cushions. "Even after the many hours it took to create the required software patterns, laser-treating the material in advance of installation took a long time," he recalls. "Each front seat centre and the door cards, for example, took four hours

LASER WORK CAN BE SEEN IN THE HEADLINING PERFORATIONS AND INTRICATELY PATTERNED SPEAKER SOUND HOLES

Facing page After much experimentation, laser applied Pasha is a triumph and fades as it reaches the front of the base cushion

Below Engine is given extra lift thanks to an ECU chipset

per panel." The Recaro logo has been impressed into the lower seat shrouds using traditional heat-embossing methods. Indeed, the more you look, the more you realise just how much work has gone into this 964's interior — other than the air vent vanes, custom gear knob, switchgear, handbrake button, pedals and red-edged seat belts, almost everything is trimmed in Alcantara, including the dash clock rings, safety belt retainers, handbrake handle (wrapped three times), ignition switch surround, seat side brackets, steering wheel and even the seat release handles.

SPEAK VOLUMES

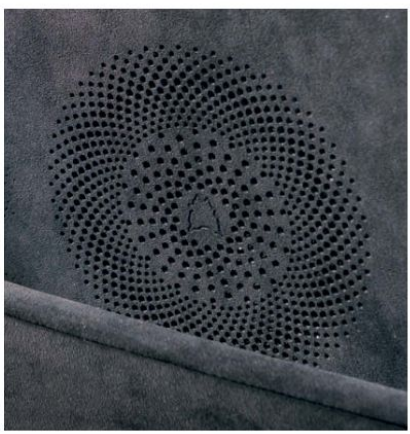
Elsewhere, laser work can be seen in the custom headlining perforations and intricately patterned sound holes, where you'd expect to see door card speaker grilles. Above them are door handles created from billet aluminium. "I know many modifiers opt for RS-inspired blank door cards with fabric pull straps, but I like the presence of door pockets, grab handles and the 964's door catch release buttons," says Dave. "With this in mind, I've created custom handles from solid billet, with six holes to reflect the fact the 911 is a car powered by a flat-six. I've also added a Dave the Trimmer logo in custom billet door releases." The same can be seen in the seat backs and the dash dials, the latter rebuilt and customised by Reap Automotive Design and joined by a clock bearing the logo of wristwatch brand, Omologato.

A Blaupunkt Bremen SQR 46 DAB head unit now takes centre stage in the Pasha-patterned dash and serves as a modern digital audio receiver whilst wearing looks straight out of the late 1980s — perfect for a 964 interior blending old and new. "The work my team and I invested in this project has resulted in the reimagining of a classic Porsche pattern by giving it a twenty-first century twist. It's also an interior which has enabled us to expand the scope of what we can do with modern technology and materials to create truly bespoke designs for our customers," he says.

And, as a Dave the Trimmer company demonstrator promoting its owner's desire to produce something unique, we have no doubt this Guards Red riot of a 964 will wow all those who see it at forthcoming car shows. Special? You'd better believe it. **CP**

Above A mobile automotive interior design exhibition coming to a show near you

Below Laser-cut holes in the Alcantara door cards replace expected speaker grilles



MILLS AND BOOM

With its tenth anniversary fast approaching, rear-engined Porsche restoration and maintenance outfit, MCE Porsche, is going from strength to strength…

Words **Dan Furr** Photography **Dan Sherwood**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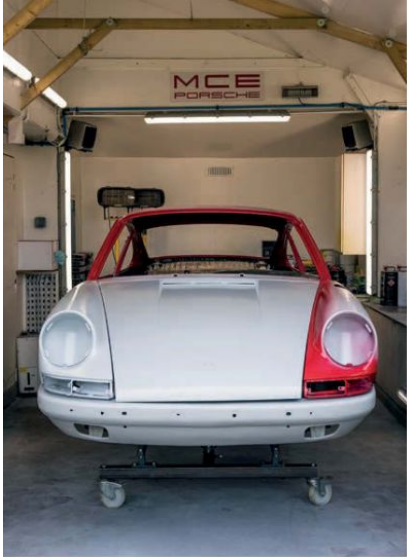
Above Mike sets to work giving the 1973 Carrera RS 2.7's flat-six a health check

Tucked away in rural Oxfordshire, not far from the historic market town of Banbury, lies MCE Porsche, a one-stop shop for air-cooled Porsche maintenance and restoration, from basic servicing through to full chassis and body rebuilds. Each of the firm's wooden outbuildings is dedicated to a different aspect of vehicle repair — one houses MCE's paint booth, another is used for engine work, and so on, giving the impression a car enters one end of the complex as a doer-upper and exits the other as a completed restoration. And yet, when peering around each door expecting to see technicians toiling, all is quiet. This is because MCE boss, Mike Champion, is responsible for all work executed on site. "Have you seen the Luc Besson movie, *Taken*?" he asks, while handing us the first of the many coffees we'll consume during our visit. "I'm a bit like Liam Neeson's character, Brian Mills, insofar as I have a very particular set of skills, skills I've acquired over a very long career," he laughs. In the film, Mills (a kind of James Bond, if 007 had consumed one too many energy drinks) is relentless in pursuit of his goal. Don't worry, there are no spoilers here, save for the ducktail on the black 1973 Carrera RS 2.7 parked outside Mike's workshop. What becomes quickly apparent at MCE, though, is how its founder has the same level of commitment as Mills, albeit to ensuring rear-engined, air-cooled Porsches are kept on the road in the very best condition possible.

MCE (that's Mike Champion Engineering, in case you hadn't already guessed) was established in 2012, following many years Mike spent working for some of the most respected names in the automotive world. "I left school not long after my eighteenth birthday and began an apprenticeship learning car bodywork repair and paint," he tells us. "I then moved onto fabrication and welding, developing my practical skills all the while, 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. Benefiting from work placement in the industry, I passed the course with first-class honours."

A SERIES OF JOBS AT MAJOR AUTOMOTIVE BRANDS PRECEDED THE FORMING OF HIS OWN PORSCHE BUSINESS

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 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 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.



Above 1968 911 S is one of the major restoration projects Mike is currently working on

Top right 1973 Carrera RS 2.7 does its best impression of Chitty Chitty Bang Bang

"Tom was trying to promote TWR as a rival for Porsche's motorsport and engineering departments," Mike recalls. "Accordingly, we offered a huge amount of in-house engineering expertise to world-renowned car brands, including Jaguar, obviously, 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. More specifically, the 911 was held up as a prime example of engineering excellence, something to aspire to and a source of real inspiration." The bug bit... hard. "I remember thinking to myself, if Porsches are so good, why aren't I working on those instead?!" Purchase of a 993 gave Mike 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."

THINKING BIG

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 Porsche sports cars. When an opportunity to buy and resurrect a pair of derelict smithy buildings in Motorsport

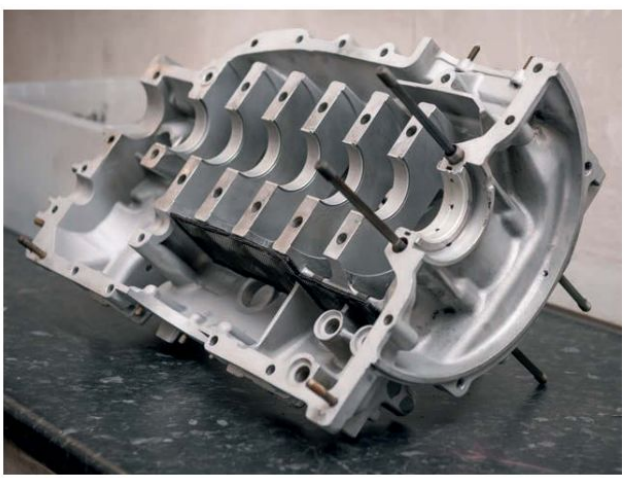
Below Full engine build underway for the 1968 911 S

Valley presented itself, I saw potential for a new home, as well as the opportunity to build workshop space enabling me to realise my dream of establishing a business conducting classic Porsche works, from minor servicing to full restoration, all taken care of in-house and exclusively for rear-engined models."

911, 912 and 356-owning friends had already charged Mike with taking care of their cars. Word of mouth quickly spread when he revealed plans to expand this work into a full-time business. "After demands of the house build eased off, I was able to take on much more Porsche work, but as a commercial interest under the MCE banner. I built the paint booth, engine room, service bay, plus space for suspension and chassis work, enabling me to provide a true turnkey service. Nothing here is outsourced, meaning I'm in total control of budgets, timescales for completion of work and have full responsibility for every aspect of a project. This is rare in the automotive world, where many restoration companies are more like project management consultancies at the mercy of third-party suppliers."

WORK AND PLAY

A trim and final assembly workshop was added during periods of lockdown in 2020. It's also the space Mike uses to store his current personal Porsche, a 1974 911 Carrera RSR 3.0 race car, which remains road legal. Regular readers may have seen the bright orange, Jägermeister-liveried firebreather pictured in our recent summaries of Porsche Club Great Britain Motorsport TracTive Suspension 911 Challenge races, which Mike competed in this year, debuting mid-season at Snetterton with a view to furthering his involvement in the series when it returns in 2022. The car spent most of its life attacking tracks in Europe before landing in Oxfordshire eighteen months ago, and though the Bilstein-riding, Toyo-rolling motorsport machine would ordinarily be the standout star of any workshop, our visit presents a selection of other extraordinary air-cooled Porsches competing for attention. For a start, there's a 1965 912, fully restored in-house at MCE. Right-hand drive, it's one of the first three examples of the four-cylinder model to be supplied to the UK. This fact alone would have been enough to get us excited, but there's more — FYN 912C (yes, that's the car's original registration) first saw service as a demonstrator for AFN, the sole UK concessionaire of Porsche cars until shortly after this 912's arrival on British shores, when, in a move designed to separate importing functions from sales



Above Mike carries out every aspect of a classic Porsche restoration at MCE, from spanner work to paint, trimming and final assembly

Above Mike's personal Porsche is a 1974 Carrera RSR 3.0, which he's raced in the Porsche Club GB 911 Challenge series

operations, Porsche Cars Great Britain was formed. The work Mike has carried out returning the car to as-new condition following its owner's purchase of what he describes as "a tired old Porsche off the road since 1978 and accompanied by boxes of removed bits and pieces" is nothing short of fantastic, so much so we're going to showcase the car in all its glory in next month's issue of *Classic Porsche* magazine.

MIKE ADDED A TRIM AND FINAL ASSEMBLY WORKSHOP DURING PERIODS OF LOCKDOWN IN 2020

A 1968 911 S is being subjected to the same full-on restoration procedure as the 912. Currently in MCE's paint booth following extensive metal repairs and time spent on Mike's Celette jig, the short-wheelbase model is being treated to year-specific bodywork corrections following incorrect application of a later battery tray and similarly aged floor by a less knowledgeable restorer. New front inner wings were also required, along with a complete rebuild of the two-litre flat-six. "Somebody had a go at overhauling the engine, but cocked it up, resulting in the cam chain tensioner letting go," he sighs.

The black Carrera RS 2.7 — a highly original, unrestored example — is undergoing an oil swap while Mike talks us through the various projects he's recently completed (the AFN 912, a 1971 911 T, a 1973 911 S and a 1976 Carrera 3.0 rank high). Emerging from beneath the car is Joe Jackson, learning his craft from Mike as part of the Heritage Skills Academy's classic

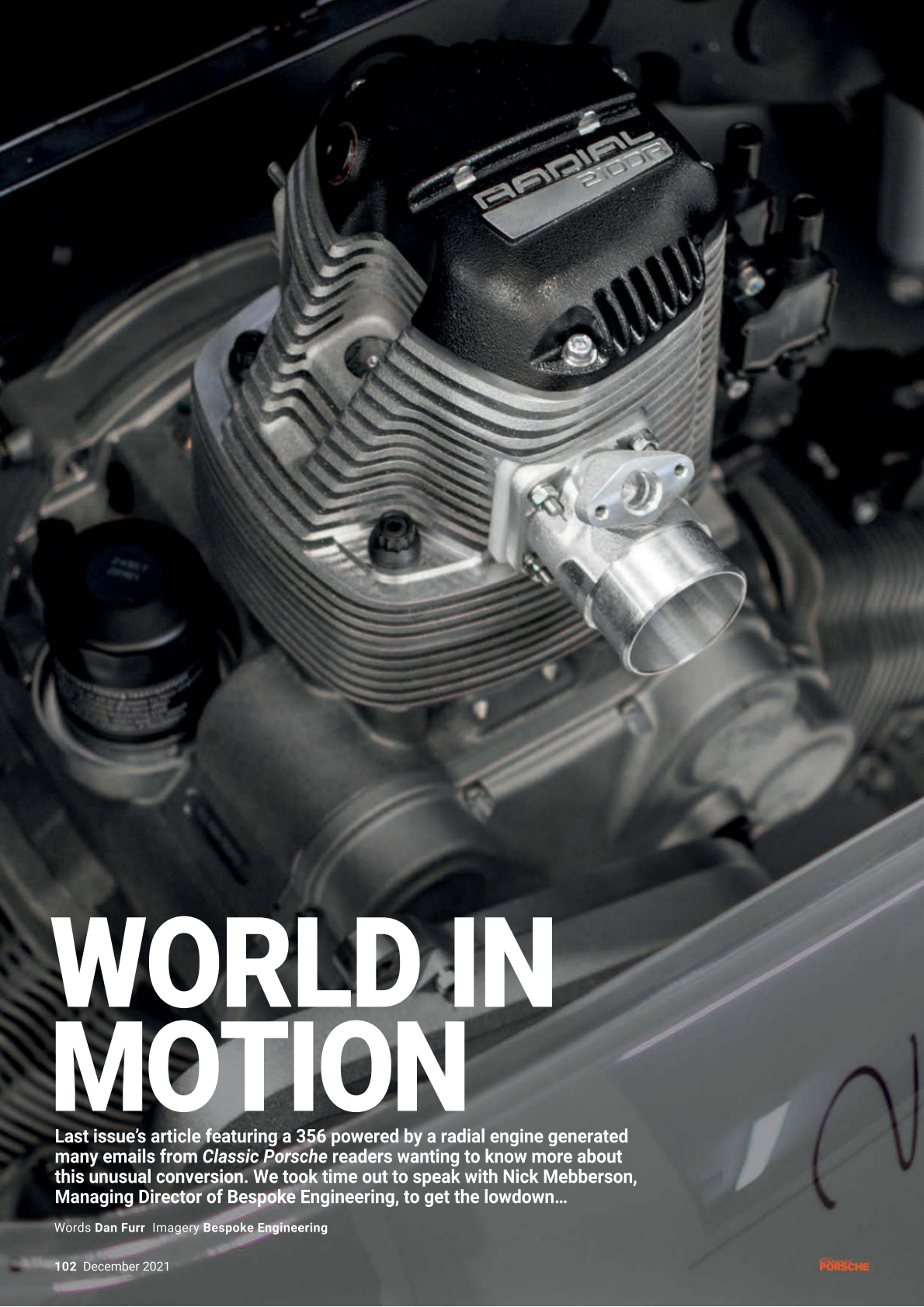
Below Freshly trimmed 'tombstones' are ready to be installed in the white Carrera 3.0 parked next to the RSR

vehicle restoration apprenticeship scheme. He'll soon be helping with tuning of the car's mechanical fuel injection system, and though most of the black beauty's suspension is original and in good working order, new engine and transmission mounts are about to be installed, along with a flush of gearbox fluid and routine servicing work.

While we've been aiming our cameras at every corner of this Porsche playground, Joe has been applying a bed of sound deadening material to the freshly painted Carrera 3.0 taking up residence in MCE's trim and final fit room, which plays host to a Singer heavy duty sewing machine, recently used to create the crisp white Porsche's new door cards and tartan-trimmed 'tombstones'. This is also where Mike keeps each project's component parts, everything carefully labelled and boxed with a view to all of it being reinstated during reassembly. "Keeping as much of a car's original componentry as is realistically possible is of vital importance," he assures as. "In most instances, repair or restoration is preferable to replacement." It's this attention to detail, this respect for heritage, coupled with Mike's 'specific set of skills', which makes MCE such an appealing prospect for owners of rear-engined Porsches looking for a knowledgeable professional to take care of the maintenance of their vehicles. To paraphrase Inspector Frank Dotzler, Forest Whitaker's character in *Taken 3*, your air-cooled Porsche is in safe in the hands of Mike Champion — this guy right here, he knows how to make Porsche problems disappear. **CP**

Above 1965 912 is one of the first right-hand drive examples sold in Britain and served as an AFN demonstrator when new

Below Joe Jackson is learning restoration skills at MCE under Mike's supervision



WORLD IN MOTION

Last issue's article featuring a 356 powered by a radial engine generated many emails from *Classic Porsche* readers wanting to know more about this unusual conversion. We took time out to speak with Nick Mebberson, Managing Director of Bespoke Engineering, to get the lowdown…

Words **Dan Furr** Imagery **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.

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 Australian company responsible for the design, prototyping and precision manufacturing of the very three-cylinder radial engine fitted to the 356 we showcased in the last issue of *Classic Porsche*) answers your 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 — 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 two-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 an bombing raid in Stuttgart in 1945.

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 94mm 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 started 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.

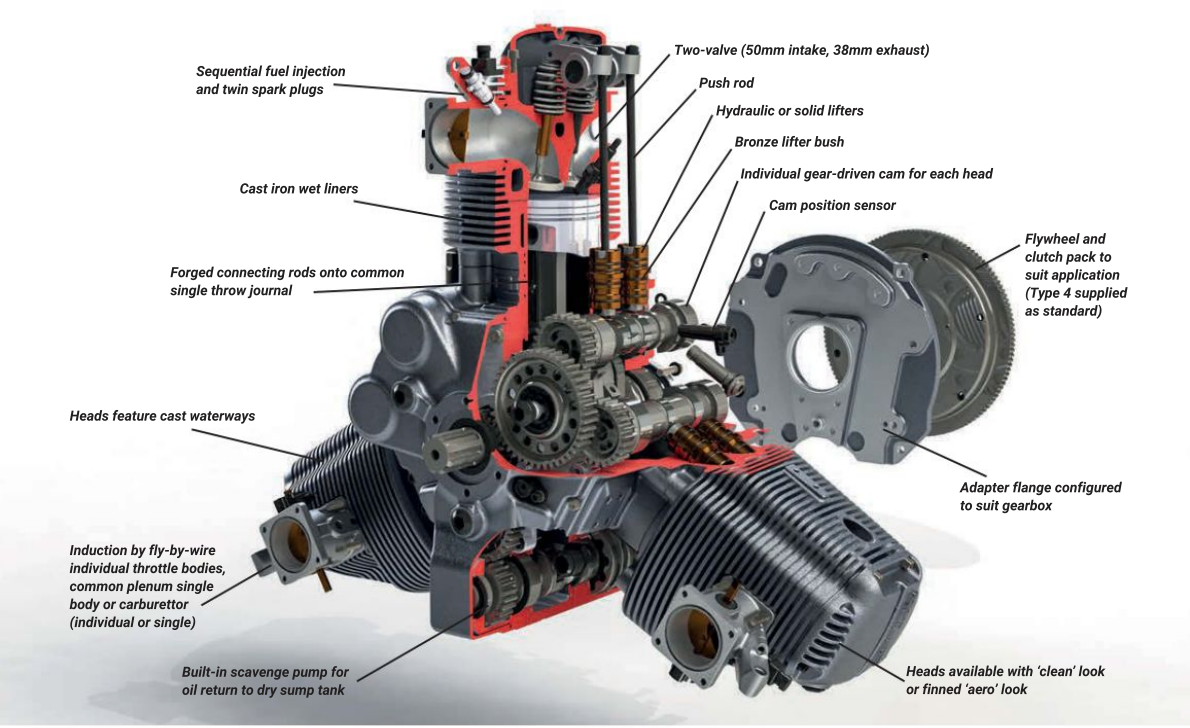
Whilst gathering Type 1 engine parts, I met Aaron Britcher, a well-known character in the air-cooled enthusiast scene in Adelaide. We had a very funny conversation — I told him I was looking for Type 1 connecting rods, but explained I only need three. He laughed and told me I really didn't know very 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 appealing to the huge market of all rear-engined, air-cooled Volkswagen and Porsche owners.

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 and 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 200k 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, 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, 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.

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 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 featured 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 arrive at Radial Motion's production engine!

The prototype engine used a mix of components. We now adopt General Motors LS1 V8 components,

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

which are widely available as OEM and performance aftermarket parts at low cost in all territories.

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 and a hemispherical head and bold crossflow ports. The majority of the components are cast, including the heads, which retain use of cast-in waterways, while the pipework is clean and minimal, with water and oil, including pressure and scavenge, 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 unit, the bottom of the radial engine can be no lower than the existing sumps. Use of a common journal (three conrods 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) and has eliminated 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 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! This engine spins up really quickly, too — before you know it, you've reached the rev limiter! I'm really pleased at how easy it is to work on the engine, with its one-piece case. Removing the front cover allows you to inspect all gears and look deep into the engine. Importantly, the camshafts can be swapped out without stripping the unit. 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 an OEM lump. 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.

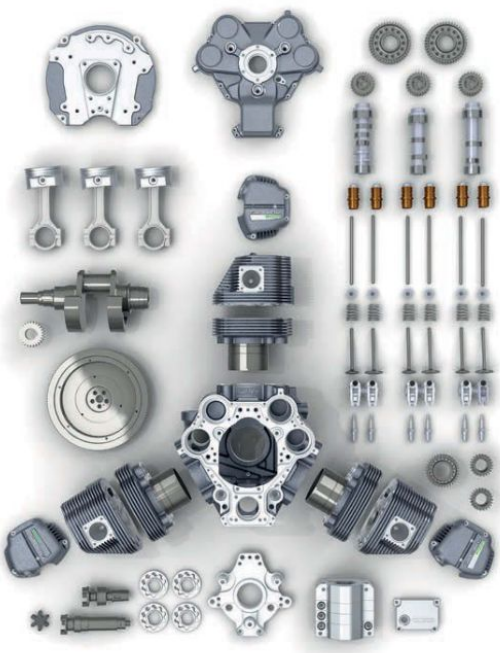
Tell us about the exhaust.

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!

Because there's 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 very 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!

What about induction?

Ordinarily, the engine uses sequential fuel injection using 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, featured in the previous issue of *Classic Porsche*. The intake roar, with the flat-cut gears whining in the



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

background, is nothing short of amazing. The one-piece case, complete with 12mm 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 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-carb unit is planned, in each case with a single intake getting an even mixture to each cylinder. Incidentally, the single-carb 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 the 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 — which will simplify 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 high-pressure fuel pump, which can be fitted into a standard fuel tank, plus a water radiator and a dry sump oil 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. Each install is different, and it's 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

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

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 in the recent Adelaide rally. First and second gears were too short, so 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 naturally 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, with 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 911s.

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 with the crazy acceleration electric motors provide and, once out on the open road or on the track, hit the 'stupid' button that couples 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 in early 2022 and 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 the website *bespokeengineering.com*.

What's the cost?

The base price is a very reasonable $25k 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 next year. Watch this space!

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

Right Radial Motion engine valvetrain exposed

90 YEARS ENGINEERING

THE ONE AND ONLY

Porsche without Zuffenhausen is like salt without pepper, fish without chips, Boris without Brexit. Our favourite manufacturer and the northern district of Stuttgart have been inextricably linked since 1938, but the bricks and mortar with arguably the most significance in Zuffenhausen is Werk 1, the first purpose-built Porsche factory…

Words **Richard Gooding** Photography **Porsche**

As this issue of *Classic Porsche* highlights, Ferdinand Porsche opened his engineering firm in Stuttgart exactly ninety years ago. Situated in Kronenstrasse 24, a street located in the heart of the city and next to the main railway station, the offices he occupied enabled him to carry out contract work for various automotive manufacturers, including Wanderer and Zundapp. Porsche's success, however, soon demanded the need for new premises. Consequently, plans were drawn up for a fresh development plant on the northern outskirts of the city. Werk 1 was born.

Construction commenced in 1937 and the new plant was completed in June 1938. Equipped with the very best facilities, assembly halls jostled for space with woodwork and sheet metal shops. Staff were soon moved to the three-hectare landmark, enabling the envied array of spaces to become the foundation of the Porsche empire. Among the first four-wheelers to be assembled at the site were numerous V303, W30 and VW38 Volkswagen Beetle prototypes. So far-reaching was Porsche's development in the *People's Car*, an outpost of the organisation established for the purpose of ensuring the Volkswagen reached production also took up occupancy at Werk 1.

The first full car to be developed at the plant was the Type 64, a machine Porsche fans will have found difficult to avoid in recent times thanks to the only surviving example being the subject of whirlwind media attention after it was announced the car would be the star attraction at RM Sotheby's 2019 Monterey auction. Developed in readiness for the planned 1939 Berlin-Rome road race, the Type 64's Beetle heritage and engine were obvious. The early VW's backbone chassis layout was retained, but an aircraft-grade duralumin tubular frame was topped by an aerodynamic alloy body with a profile now cited as the earliest expression of Porsche's singular design evolution. Powered by an uprated 985cc engine topped with Solex carburettors, the 40hp Type 64 never got to fulfil its potential — with the first example completed in August 1939, the advanced race car would have been well on its way to a position on the Berlin-Rome start line had World War II not broken out within the following month.

BATTLE STUDIES

The war didn't just impact Werk 1's output — the building itself was affected, too. Although VW-based prototypes and pre-production military machines, including the amphibious Porsche Type 166 *Schwimmwagen*, were produced during the conflict, northern Stuttgart was the focus of air attacks by allied forces. Despite extensions to Werk 1 in 1943, the risk of bombing meant remaining on-site was too risky, which is why during the summer of 1944, Porsche's offices and production facilities

Above The Porsche works team before departure for the 1969 Rallye Monte Carlo. From left to right: Klaus Leto (co-driver of Pauli Toivonen), Lars Helmer, Björn Waldegaard, Gérard Larousse, David Stone, Vic Elford and the entire supervisor team, including race director, Rico Steinemann, Dr. Engele, head of test driving and Gerhard Härle, motorsport advisor

were relocated to Gmünd, Austria. It was here, in a converted sawmill, under the guidance of Ferdinand Porsche's son, Ferry, the first true Porsches were built. Constructed in 1948, the fifty-two Gmünd-made 356/2s spearheaded the rise of our favourite car company. The same year saw Ferry and his sister, Louise Piëch, form Dr Ing h c F Porsche GmbH.

A desire to return to Stuttgart was hard to ignore. Unsurprisingly, in 1949, Porsche returned to its roots. By this time, however, Werk 1 had been commandeered by US armed forces for truck maintenance, an arrangement which would last another two years due to plans for vacating being put on hold in the wake of the Korean War. Determined to 'come home', Porsche rented a hall from nearby coachbuilder, Stuttgarter Karosseriewerk Reutter & Co. (now Recaro, the famous car and gaming seat maker). Porsche engaged Reutter to build 356 bodies, and on 6th April 1950, the first Zuffenhausen-made Porsche rolled into the spring sunshine. By the close of the year, another 368 cars had been built. A short while later, on 30th January 1951, Ferdinand Porsche passed away in Stuttgart. He was seventy-six years old.

Initially based on Volkswagen Beetle components (partly due to material shortages in the wake of the war), the 356 gradually became less reliant on its shared heritage. Increasingly powerful engines delivered proper sports car power, and a programme of continual improvement ensured the 356 stayed in production until 1965. The first major update was the 356 A of 1956 – just after the 10,000th 356 was built – and further refinements saw successive 356 B and 356 C models appear. The 175bhp 2000 GS Carrera GT racer was the ultimate incarnation, but low-slung and sporty Speedsters also ensured the 356's star shone brightly. Even so, development of the car intended to replace the 356 began in 1956. Ferry Porsche's son, Ferdinand Alexander 'Butzi' Porsche, penned the Type 754 T7 coupé, a larger and taller model lacking what many saw as the graceful elegance of the car it was supposed to succeed. Further refinements saw Butzi's design morph into the first-generation 911, a car unveiled as the 901 at the 1963 Frankfurt Motor Show. French manufacturer, Peugeot, claimed ownership to any three-digit numerical car name with a zero in the middle, which is why upon its launch in 1964, the 901 was marketed as the 911. Dropping the four-cylinder powerplants of the 356, the new model's flat-six 'boxer' engine packed 130bhp. Developed in Werk 1, the 911 went on to become Porsche's most celebrated model.

THE MOST NOTABLE CAR TO EMERGE FROM THE WERK 1 MOTORSPORT WORKSHOPS IS THE PORSCHE 917

Soaring sales figures signalled more expansive facilities. Built on land acquired from Reutter, the avantgarde Werk 2 — designed by renowned Stuttgart architect, Rolf Gutbrod — had risen from the ground while US forces remained in Werk 1. With Werk 2 operational, seven cars could be produced daily. In 1960, neighbouring buildings became Werk 3, housing the Porsche sales and customer service departments. At the same time as the 911's arrival, Porsche acquired Reutter's body plant, as well as its 1,000 employees. By

Above 917 LH coupé lined up at Werk 1 for inspection

Top middle Ferry Porsche in his office at Werk 1, 1984, with portrait of his father, Ferdinand, proudly displayed

Top right 1960 718/2 Formula Two race car and support vehicle at Werk 1

Below 911Carrera RSR 3.0s assemble at Werk 1 in readiness for the International Race Of Champions (IROC) in 1973 — twenty identical RSRs with a 300hp engine, but in a narrower Carrera RS 3.0 body, were produced. IROC included three races at Riverside Raceway in California on October 27th and 28th 1973, with the final held in Daytona on April 14th 1974

the early 1970s, several factory expansions had seen the original horseshoe-shaped Werk 1 site evolve into a fully enclosed courtyard. It wasn't just road cars which forced the plant to grow, though.

On the return to full post-war habitation of Werk 1 in 1956, Porsche's racing department and development centre had also taken up residence. Success with the earlier 1953 550 Spyder paved the way for more Zuffenhausen racing machines. The raucous, mid-engined two-seater was a winner from the start, and crowned its achievements with an overall victory at the 1956 Targa Florio. Fitted with a 108bhp Type 547 'Fuhrmann' four-cam engine (named after Ernst Fuhrmann, the genius engineer who designed the unit), the car also romped home with class wins at the Carrera Panamericana and at races held at the Nürburgring. Its 718 successor was just as victorious, whether in RS/RSK Spyder, Formula Two or Formula One configurations, powered by four or eight-pot engines.

DOMINANT FORCE

In 1964, the 180bhp Targa Florio-winning 904 followed, replaced by the 906 and 910 two years later, but the most notable car to emerge from the Werk 1 motorsport workshops is the 917. Conceived in response to changing World Sportscar Championship racing regulations and replacing the 908, twenty-five 917s were built in preparation for the 1969 motorsport season. The 4.5-litre racing machine's body was made from fibreglass-reinforced synthetic resin and sat above an aluminium lattice tube frame.

Arguably one of the most famous photographs taken at Werk 1 shows the full line-up of DM140,000 (approximately the cost of ten 911s) 917s awaiting approval. Originally, Commission Sportive Internationale (CSI), the independent arm of the FIA, visited the facility to inspect the new car for homologation approval, but with only three cars complete — Porsche's head of motorsports, Ferdinand Piëch, argued full assembly of the required twenty-five examples would be counterproductive due to the cars needing to be taken apart again for race preparation — the inspectors refused to give approval. Subsequently, on April 20th 1969, twenty-five fully built 917s were parked in front of Werk 1 for inspection. Piëch even encouraged the returning CSI representatives to test drive the cars, but his invitation was declined.

The 917's first victory was at the 1969 1,000km of Nürburgring, but the car's real success arrived when Richard Attwood and Hans Herrmann drove their Salzburg-liveried 917 to score Porsche's first Le Mans victory in 1970. Another win at the same race in 1971 secured the model's status as a Zuffenhausen deity. During the same year, Porsche's racing and technical

developments departments moved out of Werk 1 and into the newly opened Porsche Research & Development Centre in Weissach, a swift fifteen miles away. The move enabled the launch of Werk 1's dedicated customer repair centre in 1972.

Today, the wider Zuffenhausen site accommodates the production of all Porsche's two-door sports cars. A €200m, 192-metre long paint shop was built in 2011, and assembly of the 718 Cayman was brought over from the old Karmann Osnabrück site in 2016. A further new paint shop, conveyor bridge and additional production enable the all-electric Taycan to also play its part in creating heritage at the heart of Porsche. A suitably sustainable home for the model, the 'factory of the future' began development in 2015, marking the biggest Zuffenhausen construction project since the original plant was established — the new buildings cover an area of 170,000m^2, around half the size of the Vatican State!

ELECTRIC AVENUE

Taycan production began on 9th September 2019 and is carbon neutral, the result of biogas heating and electricity generated by renewable sources. Even before Taycans started rolling off the assembly line, a combined total of 250 911s and 718s were produced each day at the historic Zuffenhausen site — far from being a forgotten relic from the early days of Porsche's engineering exercises, Werk 1 remains the centre of the company's north Stuttgart home.

The Otto-Dürr-Strasse (originally Spitalwaldstrasse) buildings may now be dwarfed by other factories on the 614,000m2 site, but Werk 1's historical and cultural significance hasn't been forgotten. As if to prove the point, in 2017, the plant underwent extensive restoration, affording it the opportunity to remain the company's cornerstone for many years into the future. Complete with its official factory delivery suite, Werk 1 resonates to the sound of Porsches just as it did over seventy years ago. The official Porsche accessories store is also located at Werk 1, allowing excited owners to amass add-ons when collecting their new cars. For the ultimate Werk 1 experience, however, you'll want to order a hand-crafted personalised Porsche, courtesy of Porsche Exclusive Manufaktur. Fittingly, the bespoke car service is housed on the legendary factory site and turns the dreams of Porsche customers into reality. Proof, if proof were needed, that shining like a jewel in Zuffenhausen, Werk 1 remains the heart and soul of Porsche. Its recent further investment should ensure continuation of this status for many decades to come. **CP**

Above View of the inner courtyard of the Werk 1 plant in Zuffenhausen, Stuttgart, which developed into an enclosed square by the beginning of the 1970s following several additional construction phases

Below From production of the pre-series (125 units) Type 166 Schwimmwagen amphibious car in 1942 to several generations of Porsche race car assembly, Werk 1 has seen it all!

GOLD STANDARD

In November 1966, SoCal resident, Gerry Sturm, placed an order for a brand-new 911 S in an unusual colour. More than five decades and many autocross competitions later, this air-cooled classic is continuing to write its own story...

Words and photography **Stephan Szantai**

Gulf Orange. Viper Green. Aubergine. Such colours have played a significant role in defining early 911s. Porsche certainly wasn't shy about using bold hues and, recognising a resurgence in popularity of classic colours after a decade or more of black, silver and white Porsche paintwork reigning supreme, the manufacturer has reintroduced many shades from its classic colour catalogue for its latest products, not least the all-electric Taycan, which can now be optioned in Rubystone Red, made famous by the 964 Carrera RS and the 944 S2. Other OEM finishes have become (and remained) popular for being just as sophisticated, but less 'shouty'. A case in point is the comparatively understated Slate Grey, as seen on the 911 S coupe driven by Steve McQueen in the King of Cool's motorsport movie magnum opus, *Le Mans*.

Not all Porsche colours have enjoyed success, though. Lido Gold, a special order carrying paint code 17656, is a case in point. We'll wager few of you have heard of it. Turning a negative into a positive by recognising the colour's lack of popularity would help his then new 911 S stand out in a crowd dominated by the red, white and silver Porsches of the mid-1960s, Californian petrolhead, Gerry Sturm, elected to have his cool coupe

treated to a lick of Lido, which, we're sure you'll agree, looks more yellow than gold, in much the same way the aforementioned Rubystone Red looks more pink than it does red. Or something.

Our tale starts in San Diego, California. In 1966, Sturm (a mechanical engineer by trade) was the proud owner of a three-year-old Chevrolet Corvette, a model which became a classic in its own right — 1963 'Vettes are celebrated for their split rear window. Of course, Porsches have enjoyed a strong following on the West Coast since the 1950s, but Sturm never made the move of purchasing one to call his own. Things changed when the German manufacturer introduced its new and lively 911 S in readiness for the 1967 model year — though he'd been successfully competing in autocross competitions as an amateur with his Corvette, he immediately realised a 911 S could become an even more formidable four-wheeler. Consequently, American muscle made way for European excellence when he ordered his air-cooled sports machine through a Porsche specialist in the Netherlands and had it imported to the USA (a less expensive option than buying direct from a US-based Porsche dealer). A Dutch company named Transol Car Sales handled the transaction, placing Sturm's order with individual equipment including *aussenspiegel* (outside mirror), *lautsprecher* (speakers),

sperrdifferential (limited-slip differential), *expander* (dual luggage straps), a Blaupunk Bremen AM/FM radio and accompanying antenna. Added to the list was tinted glass and a wooden steering wheel for the cockpit, which was dressed in black leatherette.

CHASING RAINBOWS

When it was time to choose the outside colour, Sturm struggled. He wanted a light livery, reasoning dark hues prove difficult to keep clean. Even so, he didn't want the Light Ivory, Bahama Yellow or Sand Beige offered as standard. This led him to consider one of Porsche's cost-option paints from a list of more than twenty alternative shades offered in 1966 and 1967. Attracting an additional hundred dollars over the 911 S's list price, Lido Gold was — in Sturm's eyes, at least — the clear winner. Featuring hints of lime green and zesty yellow, many enthusiasts refer to is as *fluorescent*.

After zig-zagging its way across the Atlantic for five weeks, Sturm's new Porsche arrived at the Port of Long Beach on 2nd March 1967. It soon became his daily driver and, as anticipated, performed well at autocross competitions on weekends. As the years passed, however, the air-cooled coupe was retired from commuting duties and become exclusively a weekend driver for high-days and holidays, spending the rest of the time in its master's garage, away from the harsh Californian sunshine. As Porsche released newer, more powerful 911s and expanded the options available to owners of its products, Sturm took notice with great enthusiasm, picking through the updated Porsche parts portfolio and buying larger anti-roll bars, front and aft, among other items.

Being very much 'hands on' with his cars, Sturm spannered his 911 S whenever it was in need of maintenance or modification, the latter including switching the transaxle's Nadella driveshafts with lighter equivalents. A new camshaft was installed after the original part gave up the ghost 45,000 miles into service and, during the mid-1970s, he rebuilt the entire engine with the assistance of similarly mechanically minded friends. Afforded a new lease of life, the car became an active member of the San Diego chapter of Porsche Club of America (PCA), regularly autocrossing with the group and gaining a reputation as quite the 'hot shoe'.

Sturm and his Stuttgart-crested steed stopped competing during the 1980s, though he continued his driving activities with PCA, taking up the role of instructor, a position he enjoyed for many years — his involvement with the club as a driving tutor made him both well-known and well liked within SoCal's buoyant Porsche scene.

In 2010, the seemingly impossible happened: Sturm decided to sell his beloved Lido Gold 911 — on impulse. He spotted a full-page 'wanted' ad in *Panorama* (PCA's official magazine), the notice placed by a specialist dealer on the hunt for a 1967 911 S. Sturm responded, both parties agreed on a price, and the car left for pastures new soon after. Regret was almost instant: the buyer purchased the vehicle at a relatively low price, it was then 'flipped' a couple of times, before joining the inventory of Road Scholars, a respected Porsche restoration and sales specialist based in North Carolina, where private taker, Chip Perry, was a valued client. Technically, he's the car's second owner, providing you ignore the successive sales outfits which took possession of the Porsche after Sturm bid farewell.

Perry, a native of Blowing Rock, is an avid Porsche enthusiast and owns several 911s and 356s. Among the four-cylinder classics in his collection are two 1956 356

Above Very much a period colour, but one which we dare say would look great on the 911s rolling off the Porsche production line today

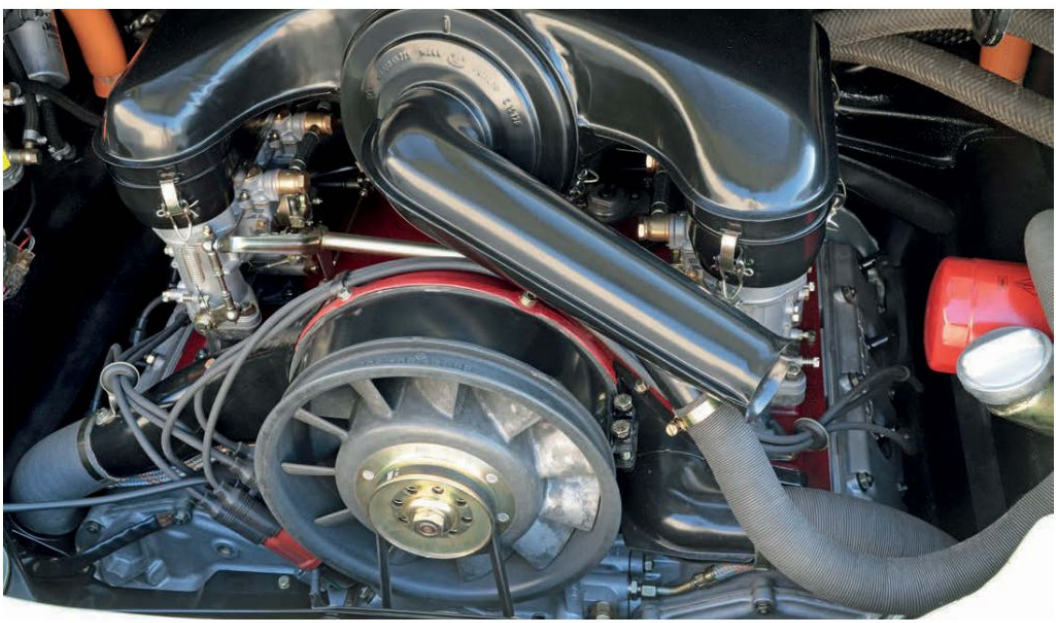
Above and below Plenty of regular use, dry storage and good old-fashioned doses of TLC have kept the car tip-top

Speedsters (including a four-cam Carrera), a 1958 356 Speedster and a mega-rare 1952 steel-body America Roadster raced by Hubert Brundage (founder of Brumos) at Sebring in 1954.

COMMUNITY SPIRIT

Interestingly, all the classic cars in Perry's private collection — be they Porsche or otherwise — share a common trait: regardless of distance covered (the Lido Gold 911 S has covered 141,189 documented miles), they were all in long-term ownership prior to his name appearing on their logbooks. Moreover, he's been able to make contact with each owner to find out more about the history of each vehicle and their adventures prior to him becoming custodian. It was with this in mind he reached out to Sturm at the point of purchase. "He told me how much this car meant to him," Perry reveals. "He loved taking it to PCA events, where people always asked him about the unusual colour. It's unusual to find anyone who has seen a Lido Gold 911 before. Even though Sturm raced this car, he always babied it when he wasn't driving in competition." Exactly how did he manage to keep the coupe unmolested and in top shape for forty-three years? "It was always garaged, kept out of wet weather and away from California's oft-harmful sunshine. Additionally, when the car was tucked up in Sturm's garage, he always kept a soft, breathable cover over his Porsche."

Nevertheless, when Perry took possession of the car, he discovered a small dink about the size of a fifty-



pence coin below the driver's door handle. The mishap, so he was told, occurred in the early 1970s, when Sturm was pushing the 911 out of his garage and the door swung open. Thwack! In period, the minor damage was touched up by a local bodyshop specializing in Ferraris, but, over time, the new paintwork had started to peel off, "creating a modest visible imperfection I really didn't like," remembers Chip, who vowed to correct the issue following his acquisition of the car. A house move and other life events delayed action, but his 911 eventually made its way to the workshop of Chris Martin, an expert painter who corrected the problem paintwork. "According to the paint thickness gauge I've used on the body, all paint is original except for the driver's side door and part of the decklid, which also seems to have been touched up at some point in the car's history," Perry tells us.

Last year, he decided to address complaints arising as a consequence of age, wear and tear. Nothing surprising, you understand — the ills all old cars suffer at some point in their long lives. Suspension bushes, for example, were past their best. Also, the engine was presenting weakness in the higher rev range and fresh underseal needed to replace the tired factory surface protection, which had started to peel away. Scott Hendry, founder of Scott's Independent in Anaheim, came to the rescue, with John Willhoit's nearby bodyshop, Willhoit Auto Restoration, helping along the way. This nifty 911 S now drives like new, with a nice power surge above 5,000rpm and an undercarriage protected from wet weather for many more years to come. This is the perfect preparation for the 1,000-mile road trip the car is about to embark on — prepared for action by Perry's friends, Steve Nye and Ken Leighton, this Lido Gold Porsche will be driving from Los Angeles to its new home in Denver via the Grand Canyon and through all the major national parks in Southern Utah following Perry's acceptance of a new job in Colorado. From competing in the autocross competitions of yesteryear to traversing the highways and byways of the Great American West in the present, it's clear this sensational 911 has many stories yet to tell. **CP**

Above Following recent mechanical work and a fresh coat of stoneguard, this Lido legend is good for many more miles at the hands of its enthusiastic owner

AGAINST ALL ODDS

Porsche pinned its hopes on the 906 beating Ferrari on home soil for the 1966 Targa Florio. The Stuttgart team didn't, however, anticipate a Swiss entry and a Swiss driver taking top honours with one of Zuffenhausen's new creations…

Words **Jörg-Thomas Födisch, Rainer Rossbach and Dan Furr**
Photography **Porsche and McKlein Archives**

Piccolo Circuito delle Madonie, 8th May 1966. It's the fiftieth outing for the Targa Florio, the dangerous road race in the Sicilian mountains held on public highways. In places, the asphalt is even dirtier and more slippery than usual – the night before the spectacle, whose participants have a good nine-hundred bends ahead of them, a thunderstorm of Mediterranean temperament hit the Italian island hard.

The masses of gathered motorsport enthusiasts, many who have travelled from all four corners of Europe, line the streets in well-known risk-taking spirit. In doing so, however, their carefree running back and forth spreads mud exactly where cars will be flying at full chat before long. Spectators gaining the perfect vantage

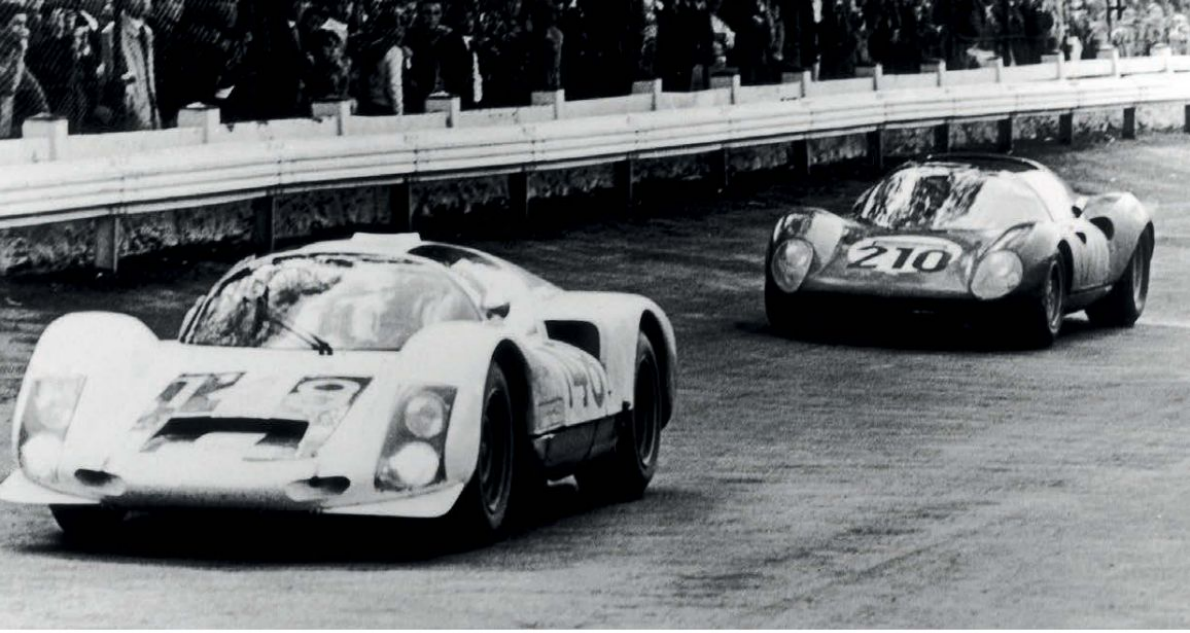
point is one thing, but on this occasion, the Targa Florio course, already recognised for promoting unintentional take-offs, is now happy send more pilots skidding than usual. Nevertheless, the sun has managed to send at least some of its rays through patchy cloud cover and made the start of the race a dry one. As has been the case at this event for some time now, the crowd will now bear witness to a duel between two premium marques, each with a rising horse on its respective crest.

Scuderia Ferrari has brought four racers across the Strait of Messina. The Modenese are relying on the Dino — three are entered, one officially from Scuderia Sant Ambroeus — but the team has also prepared a 330 P3 (driven by Vaccarella/Bandini) to be on the safe side. The pairings of Scarfiotti/Parkes (injection, dual ignition), Guichet/Baghetti (carburettors, dual ignition) and Biscaldi/Casoni (carburettors, normal ignition) will each start in a Dino 206 S.

Porsche's trump card is the 906, also known as the Carrera 6, and the Stuttgart squad is supporting six of these lightweight racers in several variations. The Klass/Davis duo is driving a 2.2-litre flat-eight-powered 906, while a pair of six-cylinder cars loaded with fuel injection are starting in the prototype class with Herrmann/Glemser and Mitter/Bonnier at the controls. The other 906s are equipped with carburettors in the sports car class. Among them is the no.148 car entered by Scuderia Filipinetti, shared by Herbert Müller and Willy Mairesse. In addition, there are five other privately entered 906s, two 911s and even a 356 SC.

The flat-four had served Porsche well in sportscar racing, but in 1966, the 906 arrived to cause trouble at the track. Not only was the car quicker through more power, newly appointed Porsche Motorsport director, Ferdinand Piëch, ensured the 904's successor was significantly lighter in its construction. More fibreglass was used, resulting in a built weight of just 580kg. Eye-catching thanks to the adoption of 'gullwing' doors and an even more aerodynamically poised nose than the 904, the 906 made its debut at the 1966 24 Hours of Daytona, where it finished sixth overall and bagged a class win. A fourth-place finish and another class victories were achieved at the same year's 12 Hours of Sebring.

The release of the film, *Ford vs Ferrari* (or *Le Mans '66*,



depending on where you're reading this article), focuses on the battle between the Blue Oval and the Prancing Horse for dominance of Le Mans, but what the movie doesn't tell you is how the 906 crossed the finish line in fourth, fifth, sixth and seventh place behind the three GT40s at Sarthe in 1966, comprehensively beating all of Ferrari's four-wheelers. Piëch's bold approach to the 906's design saw much more wind tunnel testing take place at Porsche than ever before, a reaction to Ferrari's Dino 206 comprehensively outperforming the outgoing 904. Consequently, the 906's ability to glide through air came much easier than previously built Stuttgart-crested race cars. The development work helped to draw 170mph from a flat-six lifted from the 911 road car programme (and subsequently modified with strengthened internals to ensure rock solid reliability during prolonged periods of high output operation). As per 904 production, homologation rules dictated a short-run series of road-legal 906s were assembled.

The model was only in production during 1966, but it left a deep impact on the motorsport world and can be directly traced as a forefather of the devastating 917.

ATTACK OF THE BLUE OVAL

Sicily, of course, isn't the ideal terrain for Ford's GT, yet Henry's crew have sent a GT40 with Ligier/Greder under the French Ford flag to the 1966 Targa Florio. Others are represented in greater numbers, such as Apline, Alfa Romeo and Lancia, the latter with a good dozen Fulvia HFs. Lancia driver, Giuseppe Garofalo, is the first on the track, but Leo Cella in the factory Fulvia comes back first from the first lap, having overtaken the eight cars which started ahead of him. He will keep the lead until the third lap, when stronger cars will have rolled up the field from behind. Even so, Cella/Marzi keep their nose in front and nobody can take the GT class win (up to 1,300cc) away from them come race end. For now, however, the motorsport world has its eyes fixed firmly on the Swabian air-cooled flats, as well as the V6 and V12 from Emilia-Romagna. First, Nino Vaccarella in the big Ferrari takes the lead. Gerhard Mitter in the two-litre injection Porsche, however, is only three seconds behind. Günter Klass in the 906/8 takes over and, a lap later, manages to increase the gap between the 906 and the local hero to twenty-one seconds.

When there's suddenly more thunder in the air, it's not the sounds of unbridled combustion engines, but Mother Nature registering complaint. The result is heavy rain, plenty more mud and several excursions of sports racing cars into world of off-roading. At best, bad weather and rough surface specialists feel comfortable. Unflustered rally ace, Timo Mäkinen, driving for MGB, for example, put on a great show. Klass, meanwhile, hands over to Colin Davis, who only drives one lap, in which Vaccarella comes back to the front. Mitter has a similar problem with Bonnier, who doesn't seem to fit properly into the smaller German's car. Meanwhile, Parkes has put his Dino into second position behind the man from Palermo, but gets problems with the throttle linkage — the somewhat lanky Dino wipers are making life difficult for the Ferrari drivers anyway — and ends up stuck against a tree.

THE TARGA FLORIO WAS ONE OF HERBERT MÜLLER'S FAVOURITE TRACKS, ON WHICH HE WAS TO WIN ONCE MORE

More retirements, which end up deciding the race, follow. Bandini, who now steers the leading car, has to pass the only 250 GTO at some point. Adriano Reale signs to him that he should sandbag, which Bandini unfortunately misunderstands as a friendly invitation to

Previous spread Herbert Müller gives the 906 some welly around the Targa Florio, 8th May 1966

Above The fans are close to the action when the 906 roars past in Sicily — spectators have box seats at most of the nine hundred or so corners of the island circuit

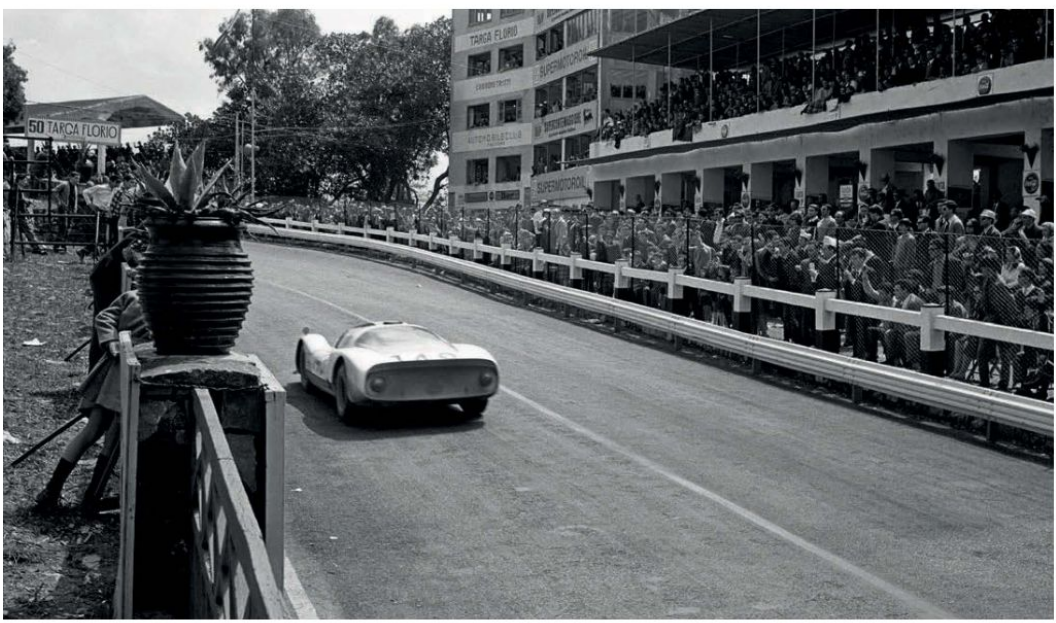
Above In the duel between V6 and flat-six, Willy Mairesse (left) and Herbert Müller came out on top, beating Giampiero Biscaldi and Mario Casoni in the Ferrari Dino

Below Two thunderstorms didn't prevent Müller and Mairesse from taking Porsche's sixth overall Targa Florio victory in ten years

overtake. Vaccarella's car suddenly has far too little road left for the manoeuvre and quickly finds itself upside down in a ditch. Because Reale is kind enough to drop him off at the pits, one of the obligatory passenger seats is actually used for once! Klass and Mitter are now at the front of the field and, truth be told, it could have been an extra fine 1-2-3 for Zuffenhausen. After all, Mairesse and Müller were following close behind in a stable third place, but an unnecessary in-house duel ruins the triple triumph — during a needless overtaking manoeuvre, Mitter's 906 touches that of Klass, thoroughly bending its chassis and forcing it to leave the road.

And so, it comes to pass, 'Kamikaze-Willy' and 'Stumpen-Herbie' drive steadily and fast, have no problems with their 906 and stubbornly put the pedal to the metal for the last three of their ten laps. At the end of the eighth, Mairesse has taken the lead. In the end, the Porsche duo completed their final ten laps and 720 kilometres in just 7:16.32,3 and won by more than eight minutes over the second-placed Dino 206 S of Guichet/Baghetti. The Pucci/Arena works 906 rounds out the podium.

The Targa Florio was one of Herbert Müller's favourite tracks, on which he was to win once more, taking the outright win for the works Porsche team in the experimental three-litre RSR in 1973. He was joined in the Martini-liveried 911 by Gijs van Lennep, victory giving Müller membership of an exclusive club of drivers who conquered the demanding Sicilian race course by finishing in first position more than once. **CP**



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