HISTORIC RACING Technology

Issue 17 UK £6.99 USA $12.00

Today's technology in yesterday's cars



F1 star rebuilds Dad's car

"Some people put an iPod on; we put the Stratos on!"

PLUS

GT40 engine tech

TVR Grantura

Iconic RS500 Sierra Cosworth

DOUBLE TROUBLE

The restoration – and further rebuild after a crash – of a classic 911 racer

17
9 772055 593004

NATIONAL MOTORSPORT ACADEMY

WORLD'S FIRST *ONLINE* Motorsport Engineering Degrees

FLEXIBLE - AFFORDABLE - ONLINE



The NMA Ex-works Lotus Cosworth Evora GTE Le Mans Car.
Driven by Johnny Mowlem, James Rossiter and Jonathan Hirschi and finished 7th in class in at Le Mans in 2011. It was Acquired in 2015 by the National Motorsport Academy for their race team. In 2018 the car will race in the Masters Endurance Legends Series.

BSc (Hons) Motorsport Engineering

NEW for 2018 - MSc Advanced Motorsport Engineering*

*subject to final validation.

The only TRULY FLEXIBLE route to gaining your Motorsport Engineering Degree

- ✓ APPLY ONLINE, choose your own start date & study from anywhere in the world
- ✓ Earn while you learn, study flexibly around work & family commitments
- ✓ 40% lower fees than other universities
- ✓ Access to student loans for UK students
- ✓ Latest industry CAD & Simulation software **FREE**

Apply ONLINE Now & *Accelerate* YOUR Motorsport Career!

NMA now has students from Formula 1, The World Endurance Championship & The World Rally Championship!

http://motorsport.nda.ac.uk **+44 (0)1159 123456**





F1 star rebuilds Dad's car

"Some people put an iPod on; we put the Stratos on!"

ON THE COVER

14 Double trouble: the restoration – and further rebuild after a crash – of a classic 911 racer

36 Former F1 pilot and Le Mans winner Alex Wurz tells Hal Ridge about the restoration of the Lancia Stratos in which his father won the first ever FIA European rallycross crown

INDUSTRY NEWS

6 FIA-approved racing replica Daytona Coupe; podium-winning GT40 MkII under the hammer at Monterey; records fall at this year's Le Mans Classic; HSCC to honour rallying Ford Escort; and celebrating a unique Maserati

FEATURES

22 William Kimberley talks to Racelogic's Julian Thomas about a reunion with one of his favourite cars

28 The Ford YB engine has a very special place in the heart of Mountune founder David Mountain, as William Kimberley discovers

32 A din invariably accompanies any move to make historic racing safer but, as Masters founder Ron Maydon tells William Kimberley, organisers have a duty to protect racers from themselves!

50 Andy Swift examines a 1960s sports car with a race pedigree that spans three continents

58 Ford's 289 V8 has been tuned for racing for more than 50 years, but as Alan Stoddart discovers, a combination of ingenuity and cutting edge techniques means that improvements are still being made

64 In an extract from a new book that charts every race that he drove for Porsche, sportscar racing legend Derek Bell recalls the first season of Group C

68 New products: Millers Oils experiments with a lubricant utilising its NANODRIVE technology; why many people choose Powerlite to replace or renew parts like alternators and starter motors

72 Book reviews: *Derek Bell – All my Porsche races* (by Derek Bell & Richard Heseltine); *Jim Clark – The Best of the Best* (by David Tremayne)

74 Alan Stoddart reflects on a record-breaking edition of the Le Mans Classic

Issue 17
Volume 5 Issue 1
Published July 2018
The next issue will be published in September 2018
ISSN 2055-5938

SUBSCRIPTIONS
Subscriptions from:
Kimberley Media Group Ltd
841 High Road, Finchley, London N12 8PT
Tel +44 (0)20 8446 2100
Fax +44 (0)20 8446 2191

Historic Racing Technology is published quarterly by Kimberley Media Group Ltd.

Cover image:
Jürgen Strawan

Design & Production:
Maluma Design Associates

Printed by Warners Midlands plc
© Kimberley Media Group Ltd.

All rights reserved. Reproduction (in whole or in part) of any article or illustration without the written permission of the publisher is strictly prohibited. While care is taken to ensure the accuracy of information, the publisher can accept no liability for errors or omissions. Nor can responsibility be accepted for the content of any advertisement.

Performance focused engine components



ARROW PRECISION

For over 40 years we've been manufacturing performance focused engine components. Our British made quality means you'll find us at the heart of the world's most powerful engines.

Call us +44 1455 234 200

OVER 40 YEARS OF BRITISH ENGINEERING

© Arrow Precision Engineering Ltd Est.1974

Discover innovation at **arrowprecision.com**

EDITOR
William Kimberley

ASSISTANT EDITOR
Alan Stoddart

CONTRIBUTORS
Chris Pickering
Hal Ridge

CONSULTANT EDITOR
Mark Skewis

HEAD OF DIGITAL CONTENT
Sara Kimberley

ART EDITOR
Paul Bullock

ADVERTISING MANAGER
Mike Norman

COMMERCIAL DIRECTOR
Maryam Lamond

MANAGING DIRECTOR
Adrian Goodsell

PUBLISHING DIRECTOR
Soheila Kimberley



@historicrace

facebook.com/
HistoricRaceTechnology

HISTORIC RACING
Technology

841 High Road, Finchley
London N12 8PT
Tel: +44 (0) 208 446 2100
Fax: +44 (0) 208 446 2191

www.kimberleymediagroup.com

Opportunities in the 'pre-owned' racing car market

PRE-OWNED, this is the phrase coined by Chris Aylett, CEO of the Motorsport Industry Association (MIA), to explain to his members, that are mainly suppliers to the contemporary motorsport industry, the huge market that exists that they are largely ignoring or are ignorant of. He told his audience at a conference the MIA was holding at Sahara Force India F1 just before the British Grand Prix that the words historic, classic, vintage, veteran, post vintage thoroughbred are all terms that can be offputting to those who don't know the market, but if you think of the entire 'historic' motorsport movement as pre-owned cars, it helps define exactly what it is.

He also drew an analogy with the pre-owned market in road cars. In the UK, the market for new cars is around £2-£3 billion a year, if memory serves, while that for pre-owned is around £8 billion a year.

With presentations from Christopher Tate, chairman of WKD Motorsport, Duncan Wiltshire, managing director of Motor Racing Legends and Sukhi Clark, senior manager, Engineering & Operations of Jaguar Land Rover, the audience was made very aware of the opportunities for those companies that are prepared to give it a go.

Wearing my hat for both Historic Racing Technology and Race Tech, I am in the fortunate position of seeing businesses that supply both current motorsport teams as well as those involved in the historic market and where the general perception might be that in the latter's case it's all about fettling and repairing 'old' cars and that there isn't much money in it, that's far from the case. As regular readers of this magazine will only be too aware of, there is a massive amount of engineering and technology that goes into keeping 'pre-owned' racing cars in the best possible condition that's absolutely on a par with those companies that supply modern teams. As I reported in the last issue, one small company specialising in reconditioning 'old' cars is also used by Formula E teams for its particular expertise, and you hardly get more cutting edge than that.

Another factor to be borne in mind is that these cars can be approaching 100 years old, although for the main part they are half that age and younger, but still, when racing cars are built to compete just one or two seasons, that fact that they are still being driven in anger in many cases means that they must be well maintained to ensure they are still safe, and that means regular servicing, reconditioning and rebuilds. Don't forget that for many racing these cars, it's a passion and they have the money to keep that flame burning.

The MIA is extremely good at introducing its members to new industries and has seen success in the automotive, defence and marine markets, but the route to those markets is far more defined. There is no real centre for the historic racing car industry as it is so diverse, but for some companies that have taken the plunge and done their homework, it is proving to be very worthwhile.

So the pre-owned phrase coined by Aylett is not attractive but it is absolutely correct and anything that helps keep such cars on the track by widening the supply base has to be welcomed. HRT

William Kimberley
Editor



FIA approved racing replica Daytona Coupe

William Kimberley

PETER BROCK, who penned the gorgeous Shelby Daytona Coupe in 1963, has returned to sell continuation versions of the iconic racer. He has teamed up with two dedicated Cobra enthusiasts, Mikael Tarne from Denmark and Bastian Ebner from American Muscle and Motorsports Services (AMMAS), with a plan to once again build, in perfect detail, exacting recreations of the six legendary racers so they could again be seen in competition at FIA approved vintage events around the world.

The excitement of seeing Cobra Daytona Coupes again on the racetrack only became stronger when the six original CSX-VIN'd cars were joined for a vintage racing appearance at the Goodwood estate back in 2015.

"Mikael and I have been labouring, literally, for several years, after a perfect FIA approved Daytona Coupe racing replica," said Brock. "This particular body form was taken directly from a 3D scan of the real car."

This is a replica of CSX 2299, the 'Italian Version', as it was the first body built in Modena by Carrozzeria Gransport and is quite different in form from Brock's original drawings for CSX 2287, the first Daytona built at Shelby's factory in late 1963.

Once the financial backing was put in place by the founding company Daytona Coupe Aps by Tarne, the project was launched immediately. First, 3D digital scans of the originals were created in 2017 by a subcontracted IT house in the US from CSX 2299 out of the Miller Collection, as well as from CSX 2287 at the Simeone Museum. The raw data was then turned into usable data by Up2Tec in Germany. From there a wooden buck was created to check the later overall dimensions physically, and no derivation was allowed nor made. The body was hand-formed over the buck by the AMMAS skilled bodymen. In order to be approved today by the FIA there was no choice but to make certain modifications. They had to have a 289 V8 and exactly the same equipment as appeared on the cars back in those days.

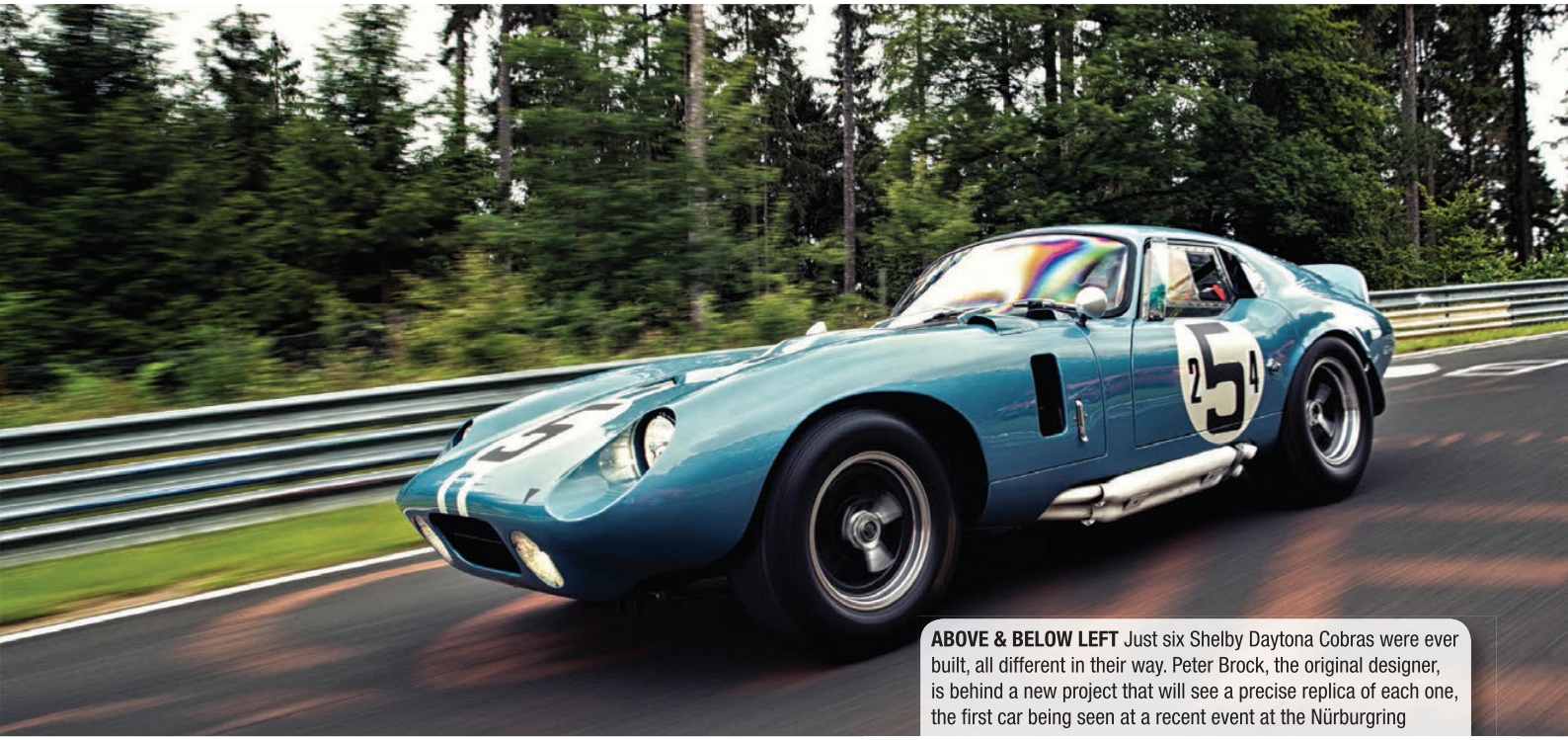
"This process took the most time, but also was the biggest fun," said AMMAS owner Ebener. "We are quite experienced in building chassis and framework that can withstand the tough conditions of endurance road racers based on the experience with our two 1968 FIA Mustang Coupes and our Cougar, plus many other customer cars, so we didn't have many headaches with the technical approach, yet the no-compromise philosophy inspired by the three of us in recreating the design and the exact body shapes just like the original needed extra attention that required way more time. The results show that it was time well spent."

AN ORIGINAL REPLICA

Since winning the World's Championship in 1965 many enthusiasts around the world have attempted to replicate the Daytona Coupe's unique lines for various purposes. What is not generally known or understood is that each of the six differs slightly from the others, so all of these presently existing "replicas" are technically and historically inaccurate, said Brock. Because all six of Shelby's Daytona Coupe bodies were hand built, one in the US and five in Italy, each had significant details in form and construction details that were missed by those who attempted to copy the originals.

Unlike many inaccurate Daytona replicas built in different parts of the world these two versions will be exact copies built on original spec chassis with original spec 289 Ford racing engines. This particular car, in 1964 Viking Blue livery, as driven to victory by Bob Bondurant and Dan Gurney at Le Mans in 1964, was introduced at the Nürburgring vintage event on 15 June. PBX2299-01 is the first and only FIA Competition Daytona Coupe recreation worldwide signed by Peter Brock. The famed Nordschleife circuit was a fitting site for a Daytona's reappearance as it was here in 1964 that American driver Bob Bondurant won the GT race in Daytona Coupe CSX 2601 and set a lap





ABOVE & BELOW LEFT Just six Shelby Daytona Cobras were ever built, all different in their way. Peter Brock, the original designer, is behind a new project that will see a precise replica of each one, the first car being seen at a recent event at the Nürburgring

record that stood for 10 years.

The next one, PBX2287-01, is already on its way to being ready in January, 2019. Note here the specific attention to the serial numbers of these rare racers. Since only six cars were built the historical significance of those numbers is vitally important to collectors, enthusiasts and motor-sports historians world-wide, as they care deeply about seeing cars that are "original' or as close to original form as possible.

"It's been 50 years since anyone has seen what an original '64 version of the Daytona looks like," said Brock. "The original six have now become so valuable that only one has actually seen any real on track action in recent years. Since Jaguar and Aston Martin have also begun making exact FIA replicas for racing at the top vintage events in Europe, it has again become possible to see and hear what these old racers really looked and sounded like."

Meanwhile the roadgoing Daytona Cobra Coupe series, fully endorsed by Brock, continue to be built by Superformance and Hi-Tech in South Africa and receive a Shelby CSX9000 continuation serial number, as they are true to the spirit of the original 1960s era Coupe. However, they are re-imagined as if they had stayed in production for the last 50 years.

"It's seldom that a designer has the opportunity to go back and refine one of their original designs," said Brock. "Jimmy Price and Superformance allowed me that opportunity in 1999 when I visited their amazing factory and saw what incredible quality was possible for a limited production version. Of all my personal cars, my Daytona Coupe is my favourite."

This Daytona Coupe is sold minus its engine and running gear for completion by a Legendary Cars dealer, such as Superperformance UK. Buyers can choose between several Ford engine options and a five or six-speed transmission, as well as air conditioning and other modern luxuries. Each one comes with a Shelby Certificate of Origin, Shelby serial number, Shelby badges, embroidered seats, kick plate and etched door handles – and now the Shelby dash plaque will include Peter Brock's signature as well and will also be eligible to be listed in the official Shelby Registry. HRT

FIA approved Daytona Coupe racing replica

Proof of Authenticity: Each recreation Cobra Daytona Coupe is fully endorsed in form of a letter of authentication signed by the original designer, Peter Brock.

FIA Approval: All cars are built according to FIA regulations and come with full HTP papers. Improved side impact crash protection has been built into the recreation, which allows some detail and quality improvements.

Chassis: Exact duplicate of the original AC-built 'round-tube' Cobra chassis as modified and constructed at Shelby American, Inc, in Venice, California. Includes original roll-over bar and seating, including FIA approved safety equipment suitable for competition.

Suspension: Independent four-wheel suspension using transverse leaf springs front and rear with Koni-style adjustable dampers at each corner.

Brakes: Girling style, dual-piston alloy callipers on discs on all four corners.

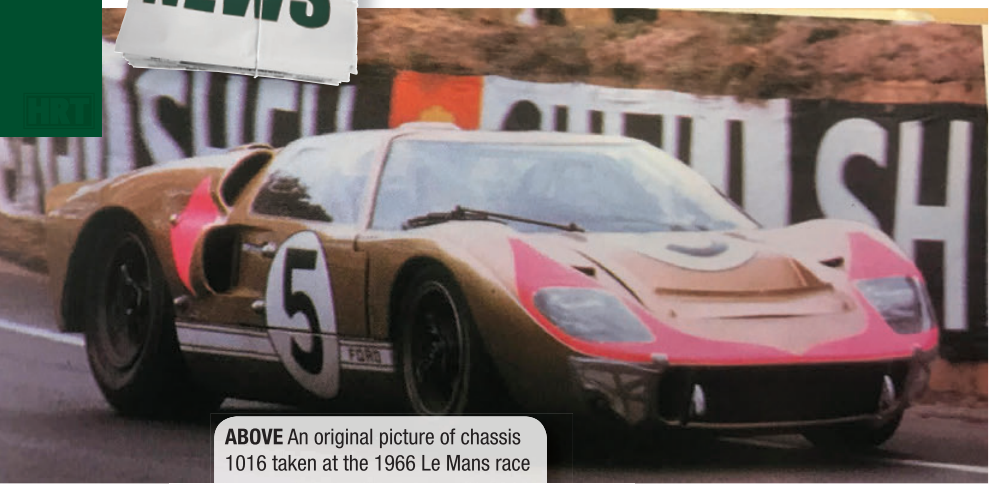
Wheels/Tyres: Halibrand-style alloy racing wheels (and spare) mounted with proper owner-selected tires, suitable for street or competition.

Fuel Tank: 30 gallon capacity with safety foam.

Engine: 289 CID Ford V8 modified with Shelby developed components in exact vintage spec approved for FIA racing.

Transmission: Borg-Warner T-10 4-speed with special 'Shelby ratios' for competition.

Rear end: Salisbury type case, with ratios and limited-slip differentials suitable for competition.



ABOVE An original picture of chassis 1016 taken at the 1966 Le Mans race

Podium winning GT40 MkII under the hammer at Monterey

William Kimberley

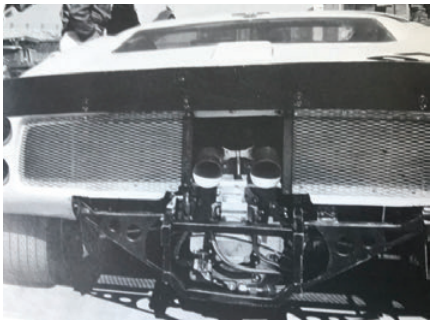
ONE of three Ford GT40 MkIIs that pounded their way to victory at Le Mans in 1966, beating the all-conquering Ferraris, is coming under the hammer at a RM Sotheby's Monterey sale in California in August. It is expected to sell in the region of $12m.

In racing terms, chassis 1016 has a short but vivid past. It could have run under the Shelby American banner, but as it was already preparing and running three cars, which Ford considered to be the limit for a team at Le Mans, along with chassis 1031, it was entrusted to Holman & Moody, of Charlotte, South Carolina. While it did not have any sportscar racing experience, it had been extremely successful running Fords in NASCAR.

At the Daytona 24 Hours, that was being used as a warm-up for Le Mans, chassis 1016 was driven by Ritchie Ginther and Ronnie Bucknum. However, it was the only casualty among the Mark IIs entered, let down by the experimental automatic gearbox.

Unlike its sister Holman & Moody car at Le Mans that was driven by Paul Hawkins and Mark Donohue and suffered a variety of ailments, beginning with a broken half shaft on the first lap and never rose above 30th place, chassis 1016, car number 5, was driven by Ronnie Bucknum and Dick Hutcherson to a secure third place behind the two Mark IIs of winners of Bruce McLaren and Chris Amon ahead of Ken Miles and Denny Hulme. Wearing gold paintwork enlivened by an application of Day-Glo pink, as pictured in John Allen and Gordon Jones' book *The Ford That Beat Ferrari*, published in 1985 by Kimberley's, it was extremely distinctive. The following year it was converted to Mk IIB specification.

"The status of chassis 1016 speaks for itself, and if it wasn't for this car, the history of motorsport as we know it would be very different," said the auction house's car specialist Alexander Weaver. "This Ford has even been restored to the condition it raced in, which will be a vital consideration for any prospective buyer. Few cars can be considered gold standard, but this GT40 is, and will always be remembered as one of the Fords that finally beat Ferrari."



ABOVE The prototype automatic gearbox that was fitted for the Daytona race, but failed

Another historic racing car that will also be seen at Monterey is the 1963 Aston Martin DP215 Grand Touring Competition Prototype, the ultimate evolution of Aston Martin's racing programme, and the last of the four completely one-off 'Development Project' cars, with its sights set squarely on Le Mans.

Ultra-lightweight, with a 4.0-litre version of the DP212 engine set farther back in the chassis and cutting-edge wind tunnel-tested aerodynamics, the car was piloted by American ace driver Phil Hill, a three-time Le Mans-winner and the first ever American Formula 1 World Champion, paired with Belgian Grand Prix and endurance racing veteran Lucien Bianchi. Reaching 198.6 mph along the famed Mulsanne Straight, it became the first car officially to break the 300 kph barrier at Le Mans.

Following its racing career, DP215 has always enjoyed a well-documented and illustrious chain of enthusiast owners. The current owners, Neil and Nigel Corner, vintage racing drivers of considerable renown and expertise, perfected the car's restoration by reuniting DP215 with its original engine, 400/215/1, which was separated from the chassis very early in the car's history but is indeed the very powerplant with which Phil Hill raced at Le Mans. DP215 is expected to bring $20,000,000 to $25,000,000 when it crosses the podium at Monterey. HRT



ABOVE The Aston Martin DP215, the first car to go faster than 300 kph down the Mulsanne Straight at Le Mans, is coming up for auction in Monterey

VBOX VIDEO



VBOX VIDEO HD2 captures stunning video in full 1080p HD with real-time graphical overlay.

Supplied in a rugged, water resistant case, with two cameras, internal GPS logger, backup battery supply, up to 30s video pre-buffer and real-time graphical overlay, **VBOX VIDEO HD2** represents the ultimate in tough, reliable motorsport video loggers.

VBOX VIDEO HD2 comes with **CIRCUIT TOOLS**, an intuitive analysis software package designed to help drivers improve their track performance and accelerate the learning process, ultimately leading to better lap times.

- Synchronised video and data
- Dual camera 1080p
- Heart rate monitor
- Class leading driver training software (Windows, macOS & iOS versions)
- Configurable pre-record buffer
- Camera preview over WiFi
- CAN interface
- CAN signal database



Professional racing drivers share their experience on advanced circuit driving techniques in our FREE eBook: www.vboxmotorsport.co.uk/ebook

www.vboxmotorsport.co.uk

Records fall at this year's Le Mans Classic

THE 2018 edition of the Le Mans Classic saw an increase in attendance of ten percent compared to the last staging of the retrospective, with some 135,000 fans, from all generations coming to watch their favourite cars battle it out, day and night, at the iconic Circuit de la Sarthe.

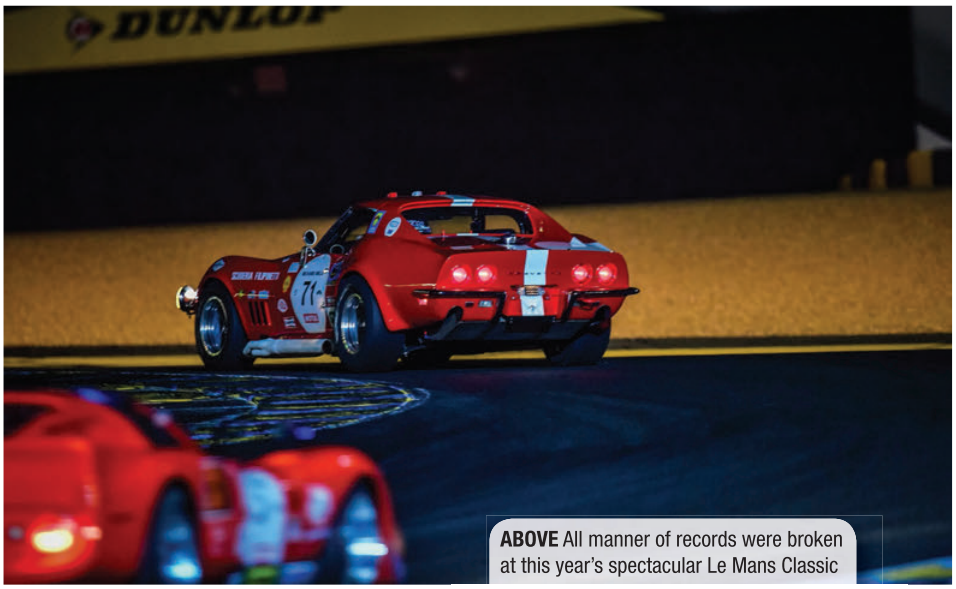
The event, which is organised jointly between the Automobile Club de l'Ouest, which also organises the 24 Hours of Le Mans, and Peter Auto has been growing since its creation in 2002 thanks to increasing numbers of drivers, car clubs and exhibitors as well as spectators.

Under cloudless skies, this year's edition saw some of the world's greatest endurance racers from a period between 1923 – 2014, with more than 700 cars competing on track, driven by more than 1,000 drivers from 30 different countries, among which were ten former winners of the 24 Hours of Le Mans. Away from the track, visitors had the chance to enjoy looking at more than 8,500 cars brought to the event by 200 clubs, representing 60 marques. The 2018 edition also celebrated some important milestones in motoring history, with the commemoration of Porsche's 70th anniversary and the 40th of Alpine's outright victory in the world renowned endurance race.

More records were broken at the Artcurial Motorcars auction run by Maître Hervé Poulain, accompanied by Matthieu Lamoure and Pierre Novikoff. After more than four hours' auctioneering 30 lots of more than €200,000, and two lots worth more than two million euros were sold, setting four world price records along the way, and achieving a total of 12.6 million euros. The jewel of the auction was a Mercedes-Benz. The car, a 1963 SL Roadster, only had an astonishing 1380 km on the odometer and had been owned by the same person since new. After a long bidding war the SL Roadster eventually went under the hammer for more than 3.1 million euros, twice its estimate, setting a new record for the model at an auction.

Another, more local record was also set at the auction, with the flag used to give the starting order to the Le Mans 24 Hours selling for more than 32 times its estimate at €32,500.

The success of the 2018 edition of the Le Mans classic was not only enjoyed by its attendees, however, with the event's organisers also relishing in the fruits of their labour. "Obviously, the success of the 9th staging of Le Mans Classic is a huge source of satisfaction and pride and an immense pleasure for us as organiser together with Peter Auto," commented ACO president, Pierre Fillon. "The enthusiasm of all these entrants, these collectors, exhibitors and above all the many spectators who come to see these cars that have taken part in the Le Mans 24 Hours or in endurance events is proof that the legend of this branch of motor sport and this iconic race is still alive and kicking. This success reinforces us in our mission at the ACO on a daily basis: namely, to continue in the same vein and boost the history of the 24 Hours in the present and in the future." HRT



ABOVE All manner of records were broken at this year's spectacular Le Mans Classic

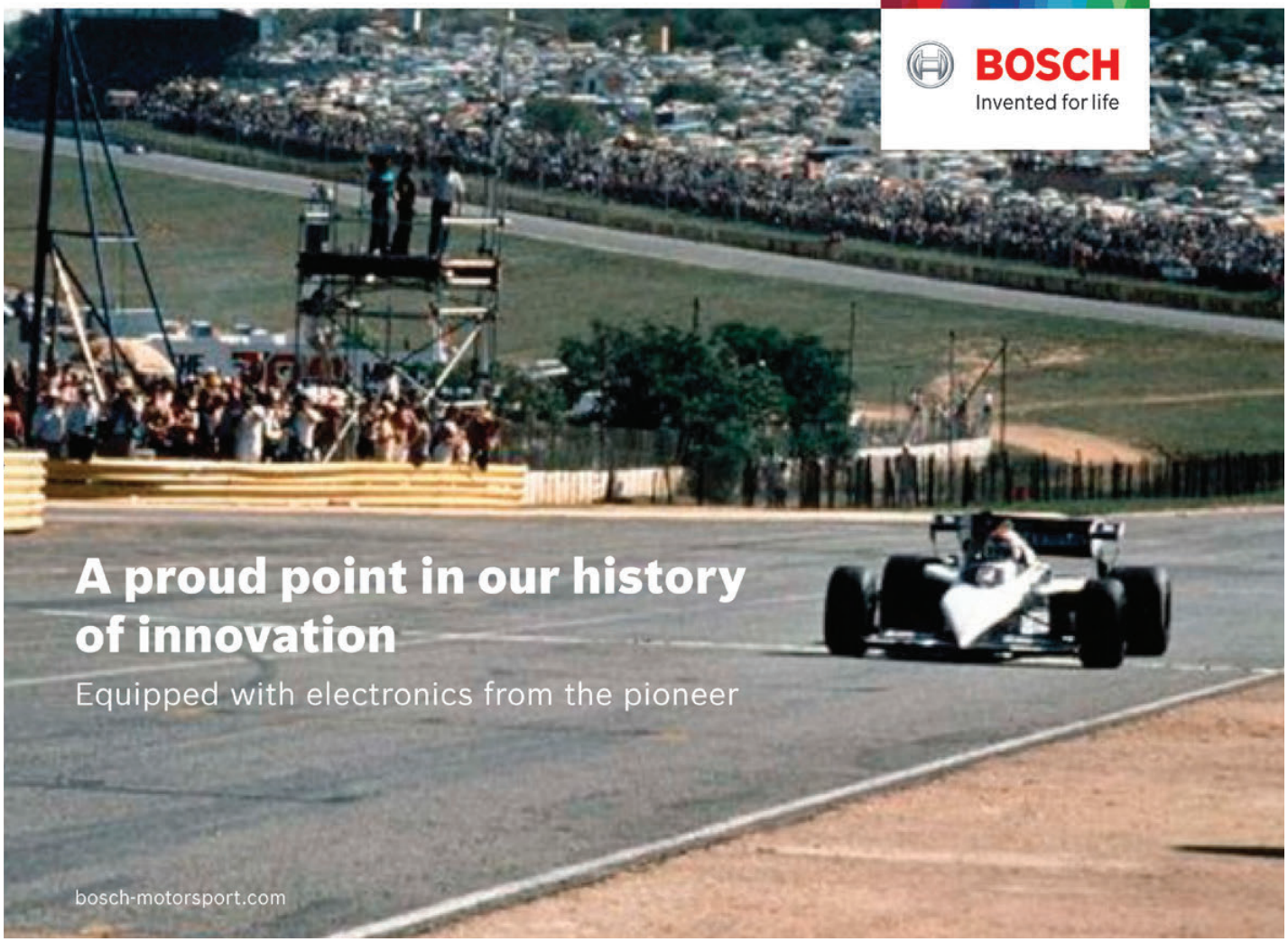


See comment page 74

HSCC to honour rallying Ford Escort

THE Historic Sports Car Club has issued an invitation for rallying Ford Escorts to be part of the Club's 50th anniversary event at Brands Hatch on Sunday 23 September. The club is looking for significant rally cars with a nice history to attend on static display as the Kent venue honours 50 years since the launch of the Escort Mk1.

Headlining the action on the Indy circuit will be two races open to a range of race-prepared Escorts running to period specifications. However, the club is keen to recognise the Escort's rallying story and is hoping to attract some period rally cars to join in this unique event. HRT



Antigravity Batteries

The Worlds Smallest, Lightest, Most Powerful Race Car Batteries

INTRODUCING THE NEW! RESTART SERIES

OEM Size Lithium Battery (Direct Replacement)

Never again worry about getting stranded with a dead battery! Antigravity Batteries introduces the groundbreaking "RE-START (RS)" line of batteries – the first batteries with built-in jump starting! The revolutionary RE-START Battery intelligently monitors its status, and just before going completely dead puts itself to sleep with just enough energy to get your vehicle started again. Simply press the RE-START button located on the battery, start your vehicle and drive away… No more dead battery emergencies or being stranded!







The original Pocket-sized Lithium Jump Starter and power supplies

The Micro-Start PPS (Personal Power Supply) is the world's smallest Jump Starter and Personal Power Supply. So small it fits in your pocket yet so powerful it can start motorcycles and some can even start V8 Trucks!!! It charges & powers most portable devices and even has a built-in flashlight. Take it with you whether you are riding, driving, camping or boating. Remain confident that you will be able to start your vehicle, make that important call, or get that last bit of work done.









Lithium motorsport batteries & pocket size jump starters

RE-START Series: FIRST Batteries with Built-In Jump-Starting!

www.antigravitybatteries.net tel: 01702 301664



ABOVE, BELOW & RIGHT The Maserati "Eldorado", the first example of modern sponsorship, where the car was painted in the colours of the partner company, abandoning the traditional colour assigned to each country by the International Federation

Celebrating a unique Maserati

William Kimberley

MASERATI has celebrated the 60th anniversary of the "Eldorado", which became famous in 1958 as the first single-seater car in Europe to be sponsored by a brand not linked to the world of motorsport.

The brand in question was Eldorado, an ice-cream manufacturer. This was the first example of modern sponsorship, where the car was painted in the colours of the partner company, abandoning the traditional colour assigned to each country by the FIA. This was a real revolution for the day, and of vital importance to the future of motorsport, which from that moment on opened its doors to new financial backers.

Maserati was commissioned to build the car by Gino Zanetti, owner of the Eldorado ice-cream company to promote his brand on the international stage with a single-seater car competing in the "Trofeo dei due Mondi" (Race of Two Worlds) at Monza. The Automobile Club d'Italia had organised a 500 Mile race at the circuit based on the Indianapolis 500, with top American and European drivers lined up to race.

The Maserati 420/M/58, chassis number 4203, was finished with a cream coloured livery instead of Italian racing red. The name Eldorado was emblazoned in bold black lettering along the sides of the car, with two additional smaller logos on the nose and below the small deflector that acted as a windshield. The logo with the face of the smiling cowboy was positioned in the centre of the nose and on the sides of the rear fin. Below the two Eldorado brands on the sides, in bright racing red



was “Italia”, denoting the nationality of the sponsor as well as that of the racing car manufacturer.

The long silhouette of the “Eldorado” also bore the name of Stirling Moss who was chosen to race it in the “Monzanapolis”.

The previous year, in 1957, the Modena-based manufacturer had won the Formula 1 World Championship with Juan Manuel Fangio, before deciding to withdraw from competitive racing and build racing cars on commission only for private customers, also providing them with assistance. This was precisely the ideal situation that Zanetti was seeking, and the reason why the Italian entrepreneur turned to Maserati.

In the space of a few months, the engineer Giulio Alfieri created the “Eldorado”. The engine, derived from the V8 unit mounted in the 450S twin cam models, had its displacement reduced to 4,190 cc, generating 410 hp at 8,000 rpm. Both the engine and transmission were offset to the left by nine centimetres to ensure a more balanced weight distribution, taking into account the anti-clockwise direction of travel on the high banked corners at Monza.

The gearbox had just two speeds while the De Dion rear axle had no differential. The tubular chassis was derived from that of the highly successful 250F, although it proved oversized compared to the latter, also as a result of numerous reinforcements introduced to enable the car to withstand the mechanical stress generated by the concrete track at Monza.

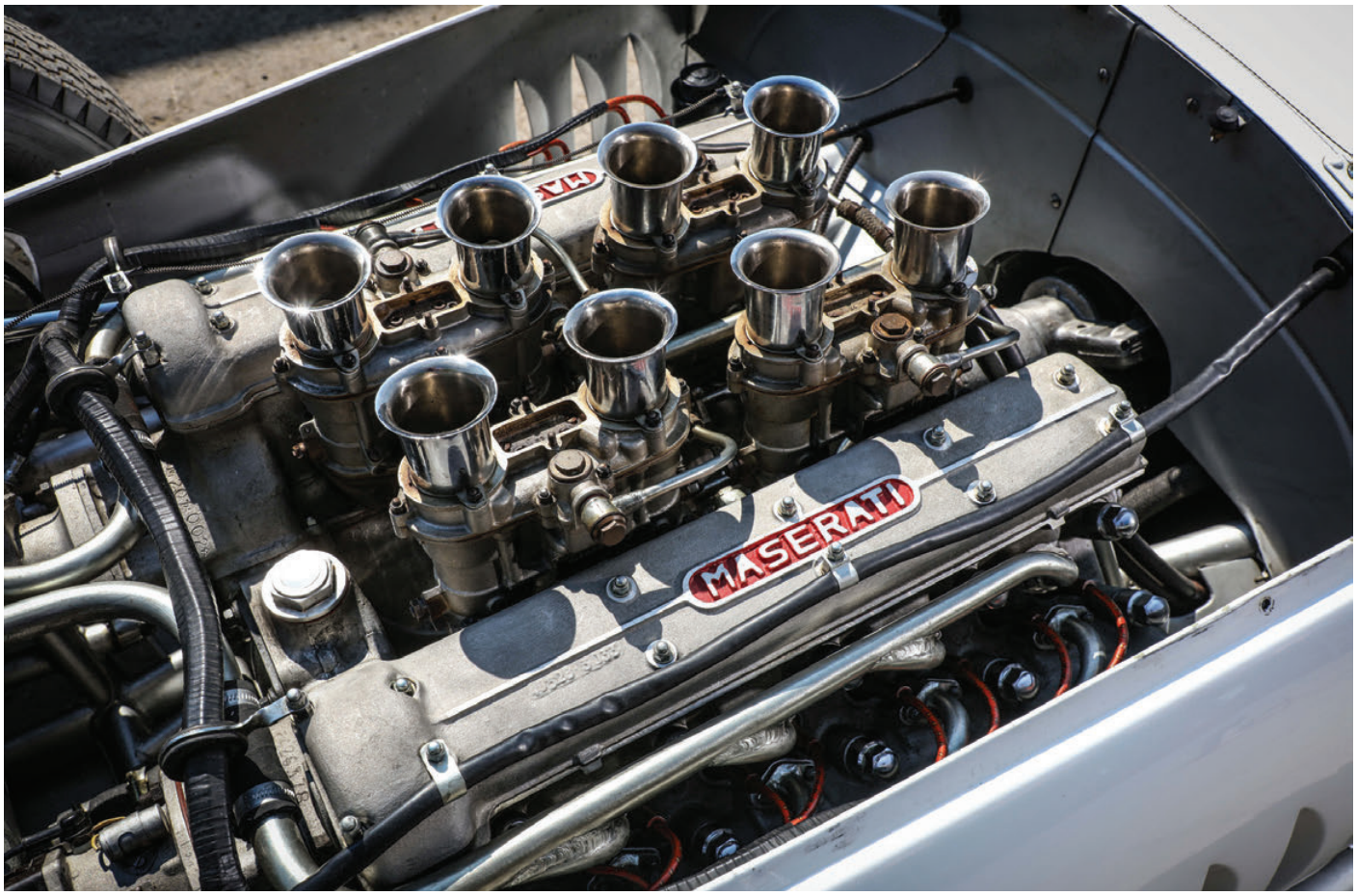
To reduce the weight, Halibrand magnesium wheels were used along with Firestone 18-inch braided tread tyres inflated with helium. With these measures, the car weighed in at 758 kg. The aluminium bodywork, hand crafted by Fantuzzi, was characterised by an aerodynamic vertical fin behind the cockpit and a front carburetor scoop.

On 29 June 1958 at the Monza track, the race was held in three heats to decide the final points table. This strategy was aimed at enticing European car manufacturers to enter their own cars, which had not originally been designed to compete in such a long race, and one that was so mechanically arduous.

In the first heat Moss finished fourth while in the second he crossed the line fifth. In the final heat, however, his steering broke and the Maserati slammed into the guard-rail, dashing the English driver’s hopes of finishing the race in third place overall.

Taking into account the three heats and the total number of laps completed, Moss nonetheless took seventh place in the end. He walked away unscathed from the crash and, all things considered, the “Eldorado” too suffered only limited damage, proving the value of its solid structure.

Despite the success in terms of spectator numbers and entertainment value, the 500 Miles of Monza did not become a regular event on the racing calendar. Based on the findings from the race, the “Eldorado” was modified by the Gentilini bodywork shop, which removed the rear fin and reduced the hood scoop, after which the car was entered in the Indianapolis 500 in 1959, but it failed to qualify. HRT





ABOVE Second time around: the car returned to the track at Oulton Park



David Stallard

You Only Live Twice

Chris Pickering charts the restoration – and a subsequent rebuild – of a classic 911 racer

THE world of classic 911s is as complex as it is alluring. There are a seemingly infinite number of different permutations, each offering a slightly different take on the iconic rear-engined, air-cooled recipe. No one is better placed to navigate this maze than Josh Sadler, founder of Porsche specialist Autofarm, and a man who has owned and raced some of the most sought-after 911s ever made.

Sadler isn't short of options when it comes to driving Porsches. His own collection includes a 2.7 RS – perhaps the most revered 911 of all – so it's telling that the car he most frequently chooses when he wants to blow off steam is the one that you see here.

"The idea was to build a fun historic 911 that wouldn't cost the earth," he recalls. "I wanted something that I could race, but also something I could use for sprints and hillclimbs or even drive to the pub. Everybody has done the 1973 RS thing and I didn't want a Turbo or something quite as wild as an RSR, so this seemed like a nice compromise."

Loosely modelled on the 1974 RS 3.0, it actually started life as a 1975 911S road car. Various bits had been added over the years, mostly dating from the late seventies, including 3.3 Turbo suspension and brakes, wide-arched Turbo bodywork and a 3.5-litre custom engine based on the basic 911 SC crank case.

The car had first been converted for competition use by 911 specialist Bob Watson in the early nineties. It was mostly used for hillclimbing and it had an early aftermarket engine management system, complete with an electronic fuel injection conversion (ironically, using a set of high-butterfly throttle bodies produced by Autofarm in the late eighties).

> "A torque curve to die for"

This proved a mixed success and after a few years of circuit racing with subsequent owners it was sold again at auction in around 2010. From there, the car disappeared without trace for a couple of years, before ending up in the hands of one of Sadler's friends in the motor trade.

"It already had a lot of the right bits ▶



ABOVE The 911 retains its enduring appeal. The car is seen here after its initial restoration

on, like Turbo suspension and brakes, so after a while I made him an offer and took the car on as a project," comments Sadler. "I knew it was going to require a total strip and rebuild. We actually got it running and it did work, but only just. It was clear the best option was to take it apart and start again."

In a way, the car was a retirement present to himself, Sadler explains. Having stood down as the boss of Autofarm, he now had the time to take on a project. Autofarm's senior technician Mark Henderson was roped in and the two of them largely worked from Sadler's home workshop. Over the winter of 2016/2017 the car slowly began to return to a raceworthy state. It went on to compete in the CSCC Future Classics series the following season. But events were about to take a dramatic turn.

During the opening lap of the final round at Silverstone the 911 was caught in a tussle between a group of modern GT3 and GT4 cars, with dire consequences.

"We had a rolling start and just around the blind corner at Copse the circuit had turned into a car park," recalls Sadler. "The people on the outside had clear tarmac, but we were on the inside, so we had nowhere to go. We were the eighth car into the melee and ended up spinning backwards into a Ferrari."

The damage was largely confined to the rear end, but it had been a significant impact. Suddenly the car found itself lining up for another major rebuild.

RESTORATION

Rewind 12 months or so and the original restoration had been relatively straightforward. When it first arrived the shell was inspected and turned out to be pretty good. Despite the odd bit of corrosion it was fundamentally sound, with a hefty roll cage that stretched right through the front and rear bulkheads to the suspension turrets.

"We went through everything," Sadler recalls. "The first job was to clean it up – as the car arrived the underside was caked in mud to such an extent you could hardly see the gearbox. Everything was stripped, checked and replaced if necessary."

Fresh discs with a set of modern CL Brakes pads were fitted, while the existing twin master cylinder hydraulic system was cleaned up and refitted, with all the perishable items renewed. A fly-off handbrake was also fitted in order to make the car easier to launch off the start line.

As with all 911s up to the late eighties, it features MacPherson struts with lower wishbones at the front and semi-trailing arms at the back. Both ends use torsion bars – now thicker items from Elephant Racing to increase spring rate – coupled with Bilstein telescopic dampers.

"With the RSRs, Porsche switched to coil springs – largely because they couldn't fit large enough torsion bars in the tubes. It also gave them the freedom to fine-tune the setup at the circuit," notes Sadler. "But torsion bars do have their advantages: they offer quite a linear spring rate, very compact packaging and they add very little to the unsprung weight."

AIR COOLED

As part of Bob Watson's original build, the 3-litre SC engine had been gutted completely and converted to 3.5 litres. Sadler carried over this configuration during the rebuild. The crankshaft and connecting rods are both production items, taken from a 3.3 Turbo. In order to complete the capacity increase, the engine uses oversized pistons from JE Pistons within a set of original Mahle cylinders that have been re-Nikasiled by Capricorn.

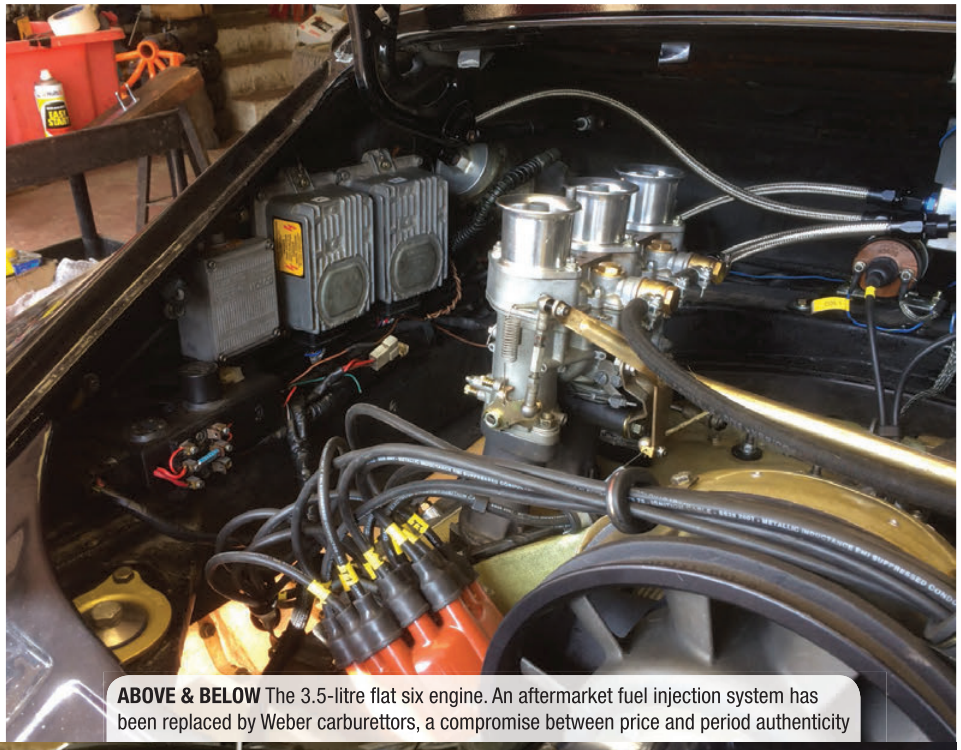
> **"People rush to put a bigger oil pump on their club racing engines, but the original worked for 24 hours at Le Mans"**

"The 3.5-litre setup seems to work very well as a bore and stroke combination," comments Sadler. "This particular engine has just shy of 100 bhp/litre and a torque curve to die for."

Dynamic balancing specialist Steve Smith at Vibration Free was called in to address the harmonic issues that tend

to affect air cooled 911s. Sadler thought it unwise to put a conventional Rattler-style harmonic balancer on the spindly nose of the crankshaft. Instead, Smith developed a clutch cover that features a built-in harmonic damper coupled to a lightweight Helix Autosport clutch plate (mounted to the beefier tail end of the crankshaft).

The competition camshaft fitted in the nineties was replaced with a slightly milder profile, in between that of a production 3.0 RS and the wild RSR racers. This was taken from Sadler's parts bin, having been salvaged from a car he raced previously. It was originally manufactured in the United States by a company owned by famed Porsche ▶



ABOVE & BELOW The 3.5-litre flat six engine. An aftermarket fuel injection system has been replaced by Weber carburettors, a compromise between price and period authenticity





ABOVE The first thing to do was clean the car. When it first arrived, the underside was caked in mud to such an extent that the gearbox could barely be seen

racer and Daytona 24 Hours winner Bob Garretson.

The aftermarket fuel injection system was swiftly replaced by a pair of period Weber carburettors. Strictly speaking, the car would need to run the later mechanical fuel injection system to meet the FIA's specification for a 1974 911; the carburettors belong to a slightly earlier example, but they were deemed a good compromise between price and period authenticity. Meanwhile, the parts bin also yielded a 1974 RSR-spec contactless distributor and ignition system, while Belgian ignition specialist RaceService4U provided the RSR twin-plug Bosch pattern distributor body, plus a period-style electronic rev limiter.

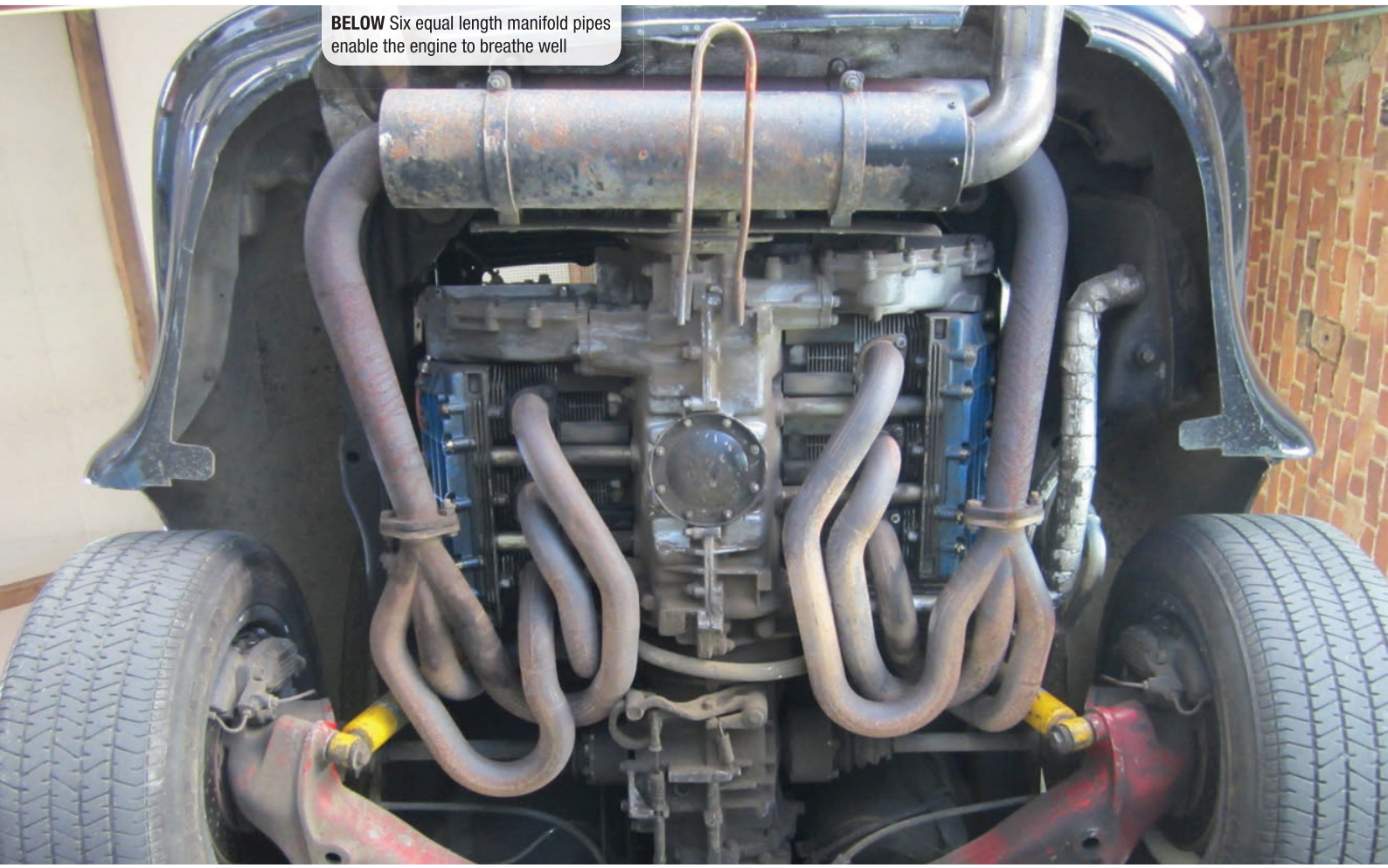
FRAUGHT WITH DIFFICULTY

"I wanted to keep it as close to the FIA regulations as I could justify financially," comments Sadler. "Electronic fuel injection wouldn't suit the period regulations and it's fraught with difficulty to set up, while mechanical fuel injection can be quite an expensive solution. The Webers, on the other hand, are cheap and very easy to live with. They don't hold their tune indefinitely, but fundamentally, you stick them on, you put in the recommended jets and venturis and then they work."

A PMO fuel pressure regulator has been added in the engine bay, along with an electronic fuel pressure gauge from Stack. "Maintaining the correct fuel pressure is critical with these engines. Getting the fuel supply and return to work properly is essential, particularly if you're going to be throwing it around on a track," notes Sadler.

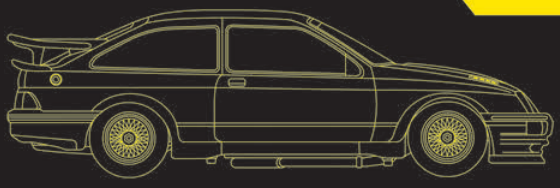
In terms of breathing, the engine has been treated to a spot of mild gas-flowing and 1 mm oversized intake valves. Mindful of the fact that the car was destined for club racing, the rest of the modifications have been relatively restrained.

"I think there's a tendency to go too far," comments Sadler. "Dramatically ▶



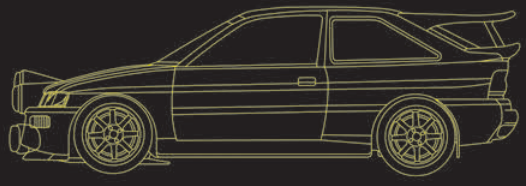
BELOW Six equal length manifold pipes enable the engine to breathe well

mountune. powering the RS for 4 decades



Robb Gravett - Sierra RS Cosworth - BTCC

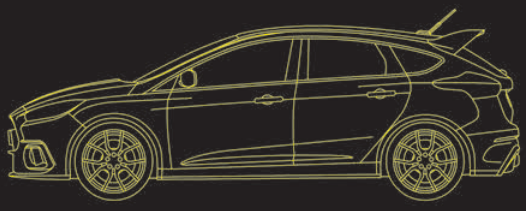
François Delecour - Escort RS Cosworth - WRC





Colin McRae Mk1 Focus RS - WRC

Motorbase Performance Mk3 Focus RS - BTCC



mountune

Moto HISTORICS

Specialists in Original Race Car Preparation & Restoration



Congratulations to Shaun Lynn & Richard Meins for finishing 1st & 3rd in class and 2nd & 4th overall in this years Group C race at Le Mans Classic in their TWR Silk Cut Jaguars

Over the past years we have had success at all major historic events with wins at Classic Le Mans, Spa 6 Hour and Tour Auto. Our aim is to supply a first class service and to be a leading and respected name within the classic racing circuit.

T: 01372 729192 *M:* 07917767558 *E:* info@motohistorics.co.uk *W:* www.motohistorics.co.uk



ABOVE Leader of the pack: 'the black racer' back in action after its recent rebuild

oversized ports and huge carburettors aren't much use unless you're flat out on the banking at Daytona for 24 hours, because you need to get the right gas velocities. Even mirror-finishing the ports can be counterproductive as it's detrimental to the boundary layer between the air and the metal. Likewise, a lot of people rush to put a bigger oil pump on their club racing engines, when the original one worked on the RSR for 24 hours at Le Mans. You just end up with a load more oil bouncing around the crankcase, which incurs additional losses and increases the oil temperature."

Nonetheless, careful attention has been paid to the cooling. Sadler had an oil cooler core fabricated by Allard Turbo Sport that was left over from a previous project. By chance it turned out to be a suitable size, so Radicool Fabrications in Brackley produced a new casing to suit the large oil cooler box on the RS 3.0-style front bumper.

ACHILLES HEEL

"An air cooled 911 lives on its oil system, because that provides much of the cooling, as well as lubrication. The oil exists in a completely different world, compared to a normal water-cooled car, in terms of flow rates and pressures. Porsche did a very good job on the basic layout of the system, but it pays to have an uprated cooler," notes Sadler.

The Achilles heel of air cooled 911s was traditionally their hydraulic timing chain tensioners. If these fail and lose pressure they can cause the chain to skip, with dire consequences for the engine. With that in mind, a mechanically-adjustable chain tensioner has been fitted; unlike the hydraulic system, this requires periodic adjustment, but it is virtually indestructible if tended to correctly.

Overall, Sadler notes, it's a relatively straightforward engine, with a wealth of experience built up over the years: "If


David Stallard

you look at the 2-litre 911S from 1966: that engine produced a genuine 80 bhp/litre, which is better than the 2.7 RS, the 3.0 RS or the 964 RS, so you have to ask 'what was so clever about that package?' It was a high compression engine, with six equal length manifold pipes that enabled it to breathe well; it was on the Weber triple choke carbs; and it was the first engine to use the RS camshaft. If you replicate that setup on any air cooled 911 you should get around 85 bhp per litre and a very responsive engine."

The flat-six heart is coupled to Porsche's venerable 915 transmission, complete with the original ZF limited slip differential. Fundamentally, the gearbox is a standard Carrera 3 design. Inside, however, it now runs a one-piece clamp-plate, designed to protect the bearings between the gearbox and the differential, while externally there's a WEVO shifter kit from Windrush Evolutions. There's also a set of competition ratios from Guard Transmission and a strengthened input shaft from a later Porsche design. An electric oil pump and a transmission cooler help to further protect things.

BACK TO THE FUTURE

Following the car's shunt at Silverstone, it was recovered to the workshop for post mortem. "We put the chassis on the jig and it was actually very good. It had tweaked the shock absorber cross member on the rear, but forward of that it was spot on. The massive roll cage probably saved it from any further damage," recalls Sadler. "Remarkably, all the crash had done to the engine was snap off an adjusting screw on one of the carburettors."

Nonetheless, it was still a big job. In order to correct the crash damage the whole right rear corner had to be replaced. The job of repairing the monocoque fell to Steve Monk at Bodywerkes, who jigged and realigned the shell; the fibreglass panels and paintwork were handled by Normandales in Daventry. Even one of the Fuchs wheels had to be straightened, for which Sadler turned to SGM RacePaint in Banbury.

Given the scale of the work involved, the decision was taken to remove the additional 'second chassis' roll cage tubes at the same time, meaning that the basic shell would now be FIA-ready, should Sadler decide to take things further. This also allowed a fresh air feed to be introduced into the cockpit for the first time, making it more pleasant to drive in hot weather.

At the same time, various other bits were tidied up. For instance, the tachometer was rebuilt with Stack electronic internals and converted to a period-style 10,000 unit rpm by Julian Reap at Reap Automotive. The end result was a car even leaner and fitter than it had been first time around.

Since its rebuild, 'the black racer' has returned enthusiastically to the track – first at Oulton Park and more recently at Spa (and so far without incident). It's now fulfilling its remit of providing fast, fun and relatively affordable racing. Proof, it would seem, that competing in a classic 911 doesn't have to cost the earth. HRT



ABOVE The tachometer was rebuilt with Stack electronic internals

A DREAM COME TRUE

William Kimberley talks to Racelogic's Julian Thomas about a reunion with one of his favourite cars



FOR some, the late 1980s to early '90s saw Touring Car racing in Britain at its height. It was fast, it was dramatic, it was entertaining but it was also almost becoming a one-make series due to the sheer dominance of the mighty Ford Sierra RS500 Cosworth.

In 1987, the British Touring Car Championship's inaugural year having changed its name from the British Saloon Car Championship, Ford introduced the 2.0-litre Sierra Cosworth to replace the XR4Ti, which at best was a midfield runner in the old series. To comply with the FIA homologation requirements, it made 5,000 of them but then cleverly made full use of the fine print that offered manufacturers the ability to produce 'evolutions' on the standard car, only 500 of which needed to be built, although not necessarily sold. The result was a world-beater.

> **"Ford cleverly made full use of the fine print in the rules. The result was a world-beater"**

With Mike Moreton heading the development team aimed at making the car unbeatable on the race tracks, Aston Martin Tickford was commissioned to do the modifications for the RS500. The result was revised suspension geometry, a larger 'whale tail' rear spoiler and an additional lower spoiler. The front bumper and spoiler were also redesigned to aid cooling and air flow. The bonnet louvre air vents were also of a different design to the standard Sierra Cosworth.

The heart of the car, though, was the same 1993 cc twin-cam YB-series engine which in standard production form boosted by a water-cooled Garrett AiResearch T04 turbo and a larger air-air intercooler, saw the power output leap from 204 bhp to 225 bhp, giving the car an impressive top speed of 154 mph. However, that was just the start when it came to the competition engine.

Modifications included a second set of Bosch L-Jetronic fuel injectors and a second fuel rail that was unused on the roadgoing version. There was also an uprated fuel pump, reworked induction system to allow higher power outputs to be realised and an uprated oil and cooling system.

In racing trim, with the car weighing in at the class limit of 1100 kg, the performance was even more staggering than the production car. With the engine now producing 520 bhp and more than 400 lb ft of torque, the car could reach around 180 mph at circuits like Spa-Francorchamps.

The RS500 was announced in July 1987 for homologation in August 1987, breaking competitive cover later that year and taking the Touring Car world by storm. The black and red-liveried Texaco-backed Eggenberger Sierras dominated the world series, claiming pole position for the remaining six races of the season and winning four of them. Were it not for an infringement of the regulations that took away a win at the prestigious Bathurst 1000, Klaus Ludwig and Klaus Niedzwiedz would have been World Champions.

The following year, the RS500 came to Britain under the wing of Andy Rouse Engineering, Ford paying the company to run the development programme in the UK. Its first campaign in the BTCC saw it take a win out of the box with Jerry Mahoney in his Aquarti-liveried car. But the season really belonged to Rouse, who



Jeff Bloxham

ABOVE Seen here going up the hill at Goodwood, the car hasn't raced in anger for 25 years

won all but two of the remaining races in his Kaliber-liveried car.

It was so successful that the following year there were up to 16 RS500s competing in the series. Ford's development contract with Andy Rouse Engineering was consequently replaced by a £5,000 bonus to the driver of a car that won a race in one. Rouse won six rounds of the 13-race series and became class winner, three early season retirements denting his overall championship chances so that he could only finish third.

ONCE IN A LIFETIME CHANCE

One enthralled spectator watching all this at the time was Racelogic founder Julian Thomas. "I first came across those cars back in the day watching them storm around the track and I also did some work with Andy Rouse when I first started Racelogic and beforehand," he says, "so I used to see those cars in the workshop and drool over them."

When he saw an ex-Rouse Kaliber car offered for sale by Duncan Hamilton earlier this year, he nearly fell out of his seat with excitement. Thomas is already an experienced racer, and we have featured his stunningly fast lightweight E-Type Jaguar in these pages before, so he is no ▶



Jeff Bloxham

BELOW Research revealed that the decals on the Kaliber-liveried car were wrong. They have subsequently been corrected

stranger to historic racing. But the thought of owning such a car as the Kaliber Sierra Cosworth, one of his favourites of all-time, was too much to resist.

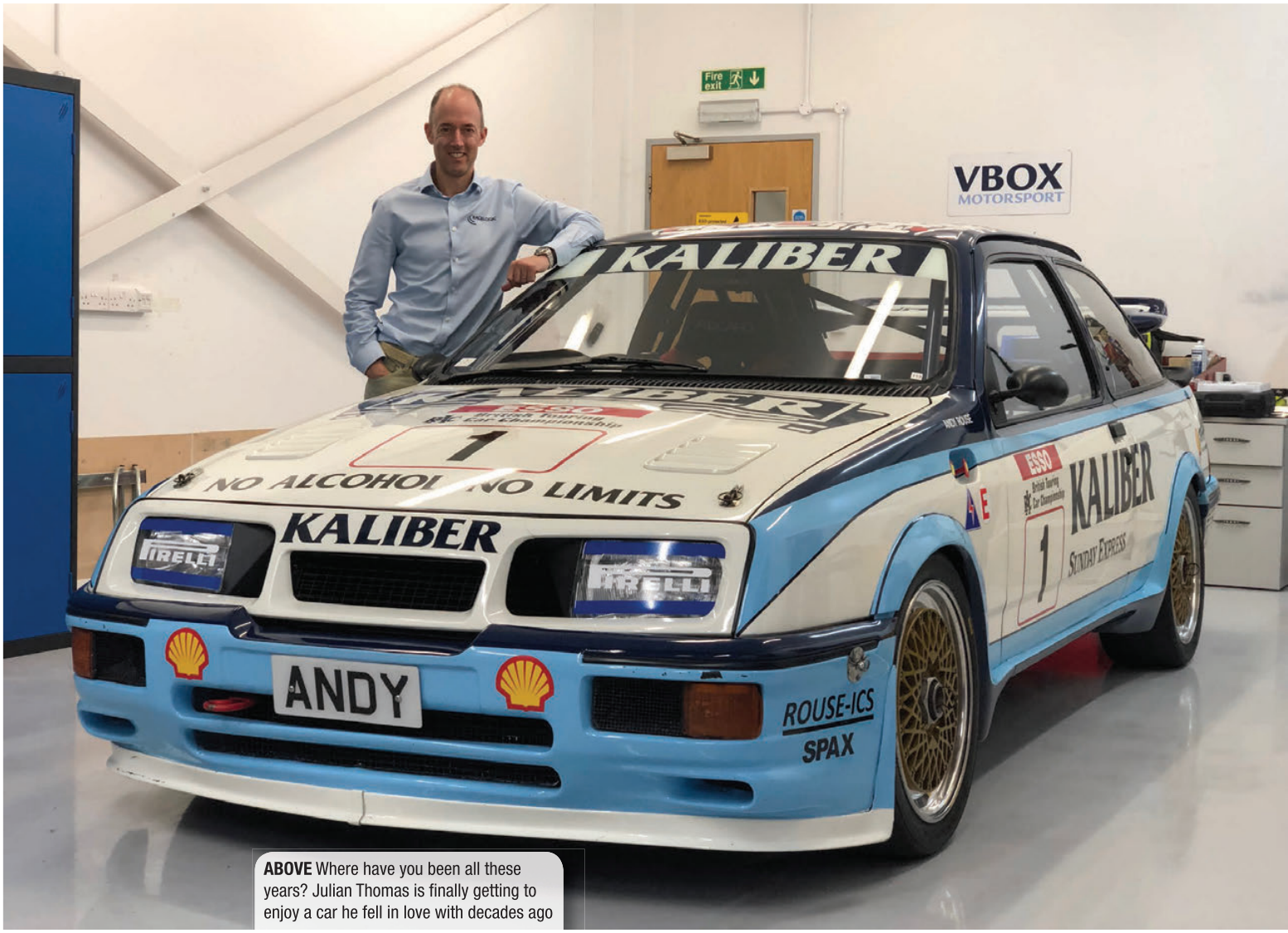
"I did a bit of research and went to see it," he recalls. "The problem with it was that it didn't have any verified history and it was a little bit sketchy as to who had driven it and where. However, although Andy Rouse is no longer involved in racing nowadays, when contacted by Duncan Hamilton, he agreed to come and inspect the car.

"My initial Internet research suggested that it was Guy Edwards' car and that Andy had never driven it, but when he saw it, he knew he had, identifying things like his seat and lots of other little things. However, he then went away to do his own research. In between though, I bought it thinking that it was good enough for me and if it turned out he had never driven it, it was still a great car anyway.

"Two days later, he came back and confirmed that he had driven it at a Silverstone BTCC meeting. Guy Edwards had written off his car in testing, so he took over Guy's car for the race, put it on pole and came third, so it went from a car with no history to one that had been driven by Andy Rouse at a BTCC meeting in 1989."

Once Andy heard who the new owner was, he was delighted, said that he enjoyed working with Julian back in the day and that the car was in good hands.

Once in Thomas' possession, the ▶



ABOVE Where have you been all these years? Julian Thomas is finally getting to enjoy a car he fell in love with decades ago

ATL
AERO TEC LABORATORIES LTD

HIGH PERFORMANCE
SAFETY FUEL CELLS



STANDARD OR CUSTOM SAVER CELLS
RANGING FROM 10 - 170L





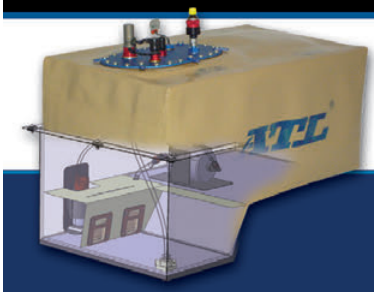
FIA APPROVED
MANUFACTURER: ATL LTD
HOM. NO: ATL 565
FIA STANDARD: FT3-1999

NEW!



60 LITRE D-CELL
DESIGNED TO FIT EASILY INTO THE WHEEL WELL OF MOST CARS! OPTIONS & ACCESSORIES AVAILABLE

CHECK YOUR REGULATIONS
VEHICLES IN GROUPS N, A, R1, R2, R3 AND E-I RUNNING TO APPENDIX J OF THE FIA SPORTING CODE NOW REQUIRE AN FIA CERTIFIED FUEL CELL



CUSTOM FUEL SYSTEMS
INTERNAL COLLECTORS & SURGE TANKS, FUEL PUMPS, FILTERS, FOAM BAFFLING & MUCH MORE!

HISTORIC REMAKES
RETAIN ORIGINAL LOOK BY USING EXISTING OR RE-MADE CONTAINER



ATLLTD.COM
+44 (0)1908 351700 sales@atlltd.com



RACEPARTS

RACEPARTS IS AN OFFICIAL LIFELINE SERVICE/REFILL AGENT

Lifeline®



3 Rockfort, Wallingford,
Oxfordshire, OX10 9DA
Tel: +44 (0) 1491 822000
e-mail: sales@raceparts.co.uk
www.raceparts.co.uk

Re-create missing & obsolete parts with 3D Printing



Strong, functional, lightweight parts, built with cutting-edge technology.

Re-create missing or obsolete components using 3D scanning and reverse engineering

Graphite Additive Manufacturing

Visit graphite-am.co.uk or contact:
sales@graphite-am.co.uk 01296 482673
We are proud Product Sponsors of Bloodhound SSC



BTCC/Ebrey

ABOVE RS500s quickly came to dominate the British Touring Car Championship grids

car was stripped down – suspension off and engine and gearbox out – and the safety gear updated. It had become a Thundersaloon for a few years after being sold by Rouse and so was chopped about a bit. Thomas has therefore been having it put back as much as possible to standard, although some of the parts such as the Spax dampers are no longer available. However, where possible, homologated parts of the time are being used to try and get it back to its original state.

It came with a sequential Getrag gearbox but also with a very original box that has now been rebuilt and put back in, while the engine has been through Mountune's hands (see separate article). It has new brakes and clutch while the road shocks on it have been replaced by Bilsteins. The car came with the original wheels that Thomas is having crack tested but he has bought an identical set of new ones anyway.

"We have tried to retain as much as we can but safety is paramount as it's producing so much power, so we've got all new fire extinguishers and a seat and so on," he says. "The car has therefore been refreshed rather than rebuilt and so still has some of the patina from 1989 on it."

The car has worn several different liveries in its lifetime as it was campaigned quite a bit after it was sold by Rouse, but the owner Thomas bought it from had put it back into the original Kaliber colours. However, a stickler for perfection, Thomas noticed that the stickers were not quite right.

"I did a lot of research and found that the lady who used to do the BTCC stickers back in the day was someone I used for my stickers as well and that she had everything on file," he explains. "She looked at those on my car and told me that they were all wrong, so they've all come off and were replaced by exact copies of the originals, so it's getting closer to how it raced back in the day."

At the time of writing the car is still being refurbished, having a public shakedown test at the Goodwood Festival of Speed and then due to race at the Silverstone Classic.

For Thomas, having such a car is a dream come true. Although used to competing in fast machinery, he concedes the thought of taming the claimed 574 bhp is rather daunting. "I will be treating it with great respect," he says, "at least for the first few laps." HRT

Chassis number ARE02089

- Built by Andy Rouse Engineering 'ARE' for the 1989 BTCC season
- Driven by Andy Rouse in the 1989 Silverstone round
- Shared with Win Percy in the 1989 Donington endurance round
- Pole position and two podiums in 1989
- Only four owners from new and in the same ownership for the last 22 years
- Most original Group A RS500 remaining in Kaliber colours
- Extremely original, unraced for 25 years

DOCKING

Advanced Cooling Systems

Water Radiators
Intercoolers
Oil Coolers
Heat Exchangers
System Design
Ancillary Products

Manufactured to your requirements by the UK's leading supplier.

E info@dockingengineering.com
Tel 00 44 (0) 1327 857164
Fax 00 44 (0) 1327 858011
Website www.dockingengineering.com
Unit 15 Silverstone Circuit • Silverstone Northants • NN12 8TL • United Kingdom

WREN Sport

Historic Car Preparers and Race Circuit Support



Contact:
Tel: 01747 852899 | Fax: 01747 854988
Email: info@wrenclassics.com
Website: www.wrenclassics.com

MILLERS OILS

Millers Oils

GET UP TO

63% reduction in friction

38% reduction in wear

USING OUR CLASSIC SPORT HIGH PERFORMANCE 20w50



- Utilises latest lubrication technology to improve and enhance classic vehicles
- The reduction in friction leads to significant power and torque gains and improved fuel economy
- Developed for classic vehicles competing across a range of motorsport categories

For further information visit
www.millersoils.co.uk/classic
Tel: +44 (0)1484 713201
Email: sales@millersoils.co.uk

MADE IN BRITAIN

WHY THE YB IS NOW BACK ON THE RADAR

The Ford YB engine has a very special place in the heart of Mountune founder David Mountain, as **William Kimberley** discovers

MOUNTUNE has been building engines and designing and producing performance parts for over 35 years. During that time it has powered teams around the world to victory in the World Rally Championship, the World Touring Car Championship, World Rallycross, Formula 2 and Formula Ford. However, it is its longstanding involvement with the British Touring Car Championship (BTCC) that has mainly caught the enthusiast's eye. It is currently providing the engines for the Team Shredded Wheat Racing with Gallagher and Team GardX Racing with Motorbase Performance Ford Focus RS outfits, continuing a long involvement with Ford that stretches back to the YB engine.

The YB engine was based around the 1993 cc Pinto block, onto which was fitted a Cosworth-designed DOHC alloy head. A Garrett T3 turbocharger was added, along with Weber-Marelli computerised electronic fuel injection. Mountune founder David Mountain quickly realised its potential and started development for race and rally applications. His team of engineers worked closely with Ford's own motorsport group based at the Boreham facility in the UK to supply various works teams and privateers with Ford YB engines.

"We got into the YB engine when it was very first launched in production saloon cars in 1986 with the Uniroyal and Monroe championships," says Mountain. "Basically the minute the Sierra Cosworth came out we were involved with it. We did a couple of years with Robb Gravett in Production Saloon/Group N, winning the championships and also the Willhire 24 Hour race in 1987."

Initially, though, only the Rudi Eggenberger Motorsport cars were competitive in the World Touring Car Championship, while Andy Rouse Engineering in the UK and Dick Johnson Racing in Australia struggled. Then along came the Sierra Cosworth RS500 in August and things began to change.

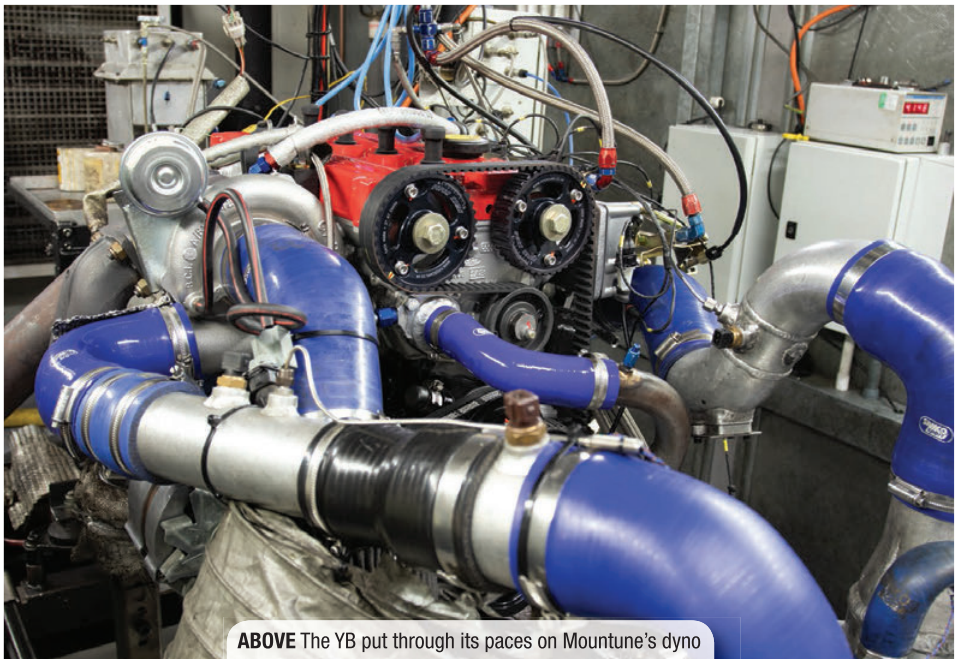
As Mountain explains, he was in for an eye-opener. While the Eggenberger team dominated the World Touring Car Championship, Andy Rouse Engineering the BTCC and Dick Johnson Racing the Australian Touring Car Championship, the three teams rarely came head to head. However, there were three occasions when their paths did cross: the 1987 Bathurst WTCC, 1987 Calder WTCC and the Silverstone RAC Tourist Trophy in 1988.

BIG THREE RIVALRY

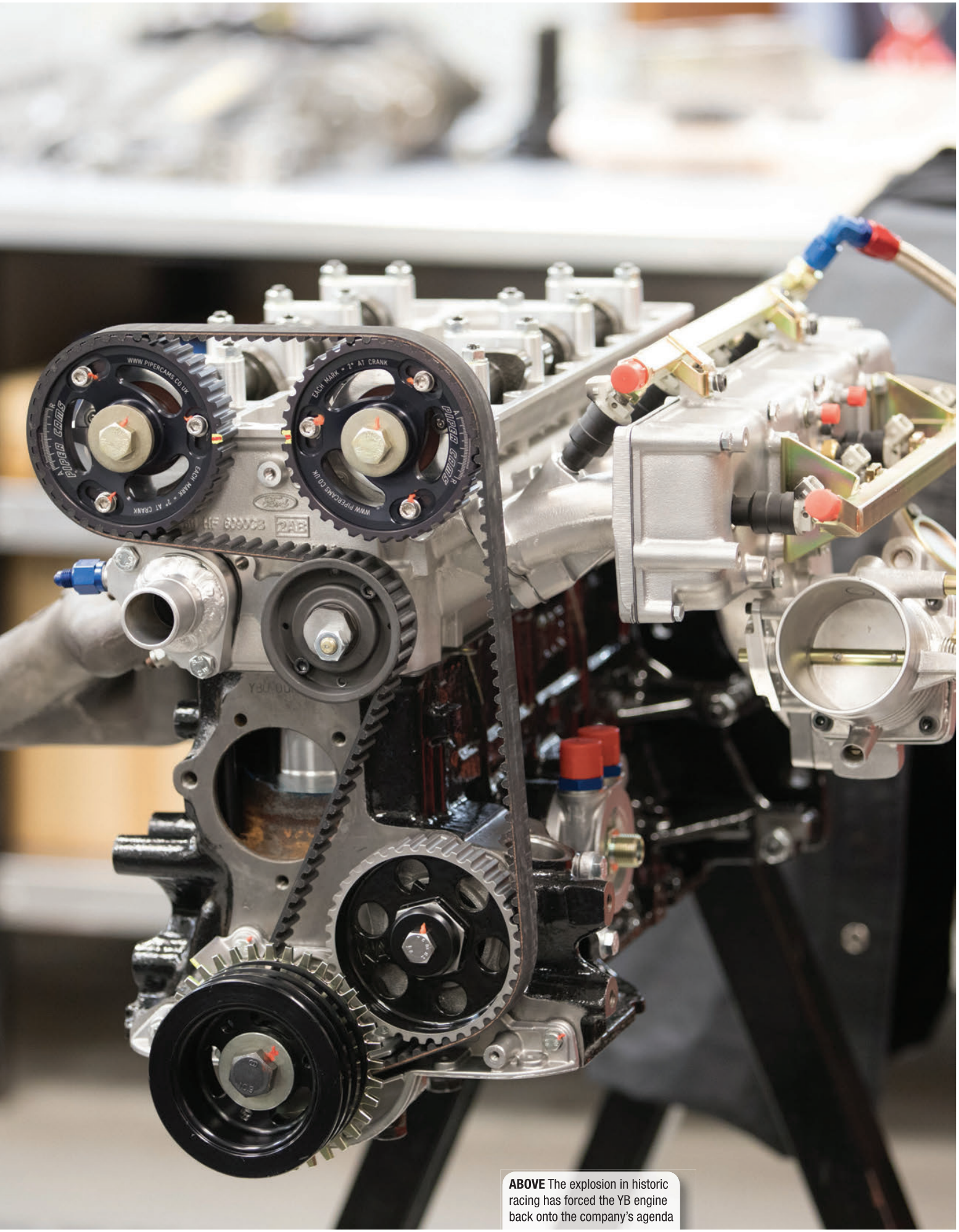
At Bathurst, the DJR team had a terrible time with both of its cars out of the race within three laps. Rouse, who had teamed with Allan Moffat for the Australian events as he was looking to race Rouse-built cars in Australia, was fast in the race and taking it to the Eggenberger cars, but he retired on the 31st lap with transmission failure. The Eggenberger Texaco Sierras finished first and second, comfortably ahead of Peter Brock's Holden Commodore, but were subsequently disqualified for a rule infringement that ultimately cost them the World Championship.

At Calder, the DJR cars also had a very poor showing. So when it came to the TT race at Silverstone, the Aussies had a point to prove as it was the third time that the three teams were up against each other.

By this time, they knew all about the cars. The Andy Rouse and DJR teams dominated their respective championships, although Rouse lost out in the BTCC to Frank Sytner's class-winning BMW M3. As the WTCC was scrapped after just one season, the Eggenberger ▶



ABOVE The YB put through its paces on Mountune's dyno



ABOVE The explosion in historic racing has forced the YB engine back onto the company's agenda

squad concentrated on the European Touring Car Championship, although again the class system worked against it despite dominating the races.

"Here were the brash Aussies wandering around the pit at Silverstone telling us that they were going to blow us guys away and we were just laughing," recounts Mountain. "They'd never been to the circuit or even seen it. There were the Andy Rouse Engineering and Eggenberger Motorsport cars there, so what did the Aussies know? Then DJR driver John Bowe put his RS500 on pole! Rouse was throwing tyres at his car, as was Rudi, to no effect."

FASTEST RS500 IN THE WORLD

Bowe didn't win the race due to 'vapour lock' problems, but as Mountain points out, it was absolutely clear that the Australians had the fastest Sierra Cosworth RS500 in the world.

"There was some doubt about how legal that engine was but it was never proved and could have been sour grapes," he concedes. This is a reference to the rumour that went round that the turbo exhaust housing had been cut open, extensively ported and then welded back together. This was said to be worth as much as 50 hp on these engines and if the car had won, it would have been subject to a post-race scrutineering check and this 'anomaly' shown up.

"The Aussies had a very well handling car and a very powerful engine, so it was a very good package that they had quietly been developing in Australia," he says. "It was a very competitive series there that we hadn't taken very seriously.

"It was absolutely clear that what Johnson had done was to pick the best of everything. He'd picked Rudi's suspension as his car had the German setup and his cars handled superbly, but he always ran an endurance car with a 24-hour engine, which is why they got their arses kicked when they came over to the UK as Rouse was running sprint engines and there was a big difference in power."

The Australian cars' competitiveness in the race was enough for driver and team owner Mike Smith to make a deposit there and then for both the cars for Trakstar, the new team he had formed with Gravett.

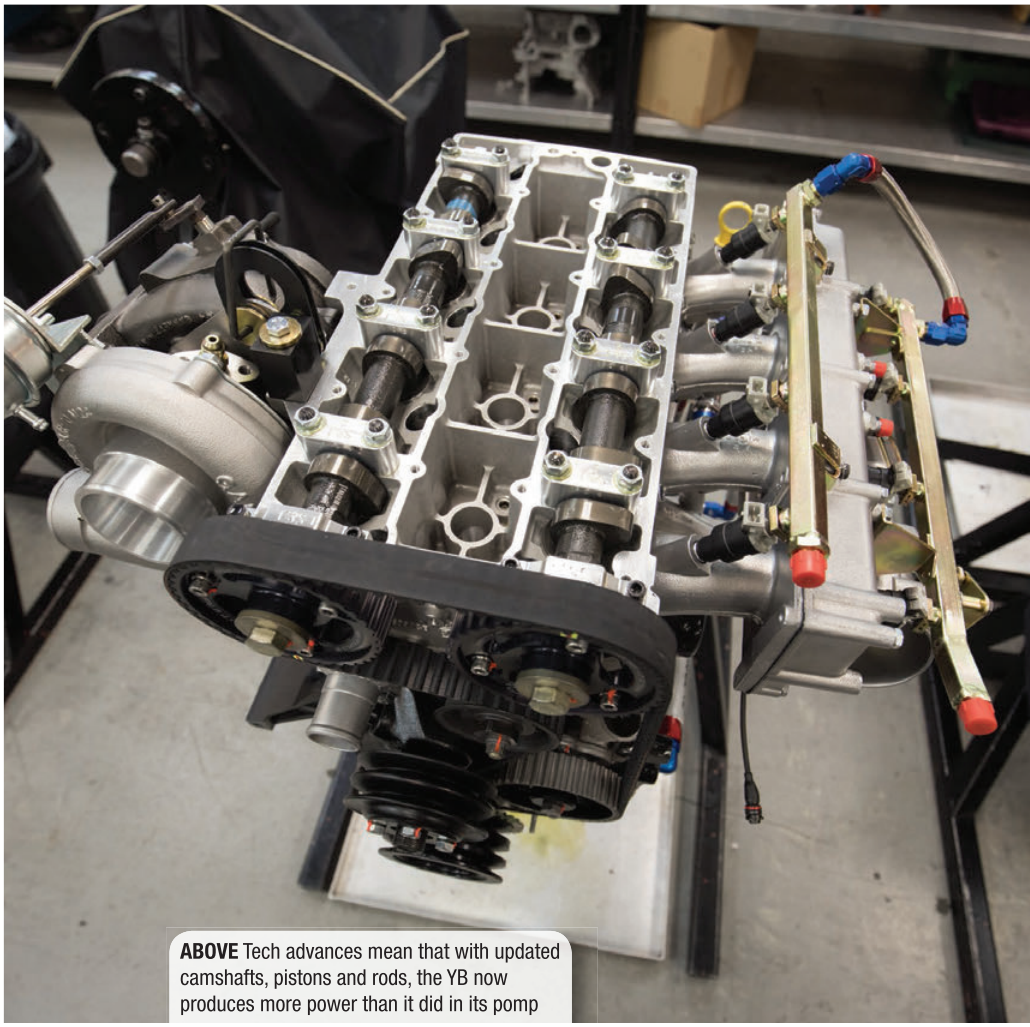
"Literally after that race Mike Smith, who was Robb's partner in Trakstar, put a deposit on those cars there and then. So we had those cars come to us with the job of rebuilding them for the '89 season," recalls Mountain.

"One very interesting thing we discovered on the car was that it didn't have a limited slip diff but a spool, the Detroit locker, so it was a locked rear axle. This was odd as you would have thought that it would have created horrendous understeer, but what it had was fantastic traction because it was a locked rear diff and they'd got the geometry such that it didn't understeer, but turned in and went round corners."

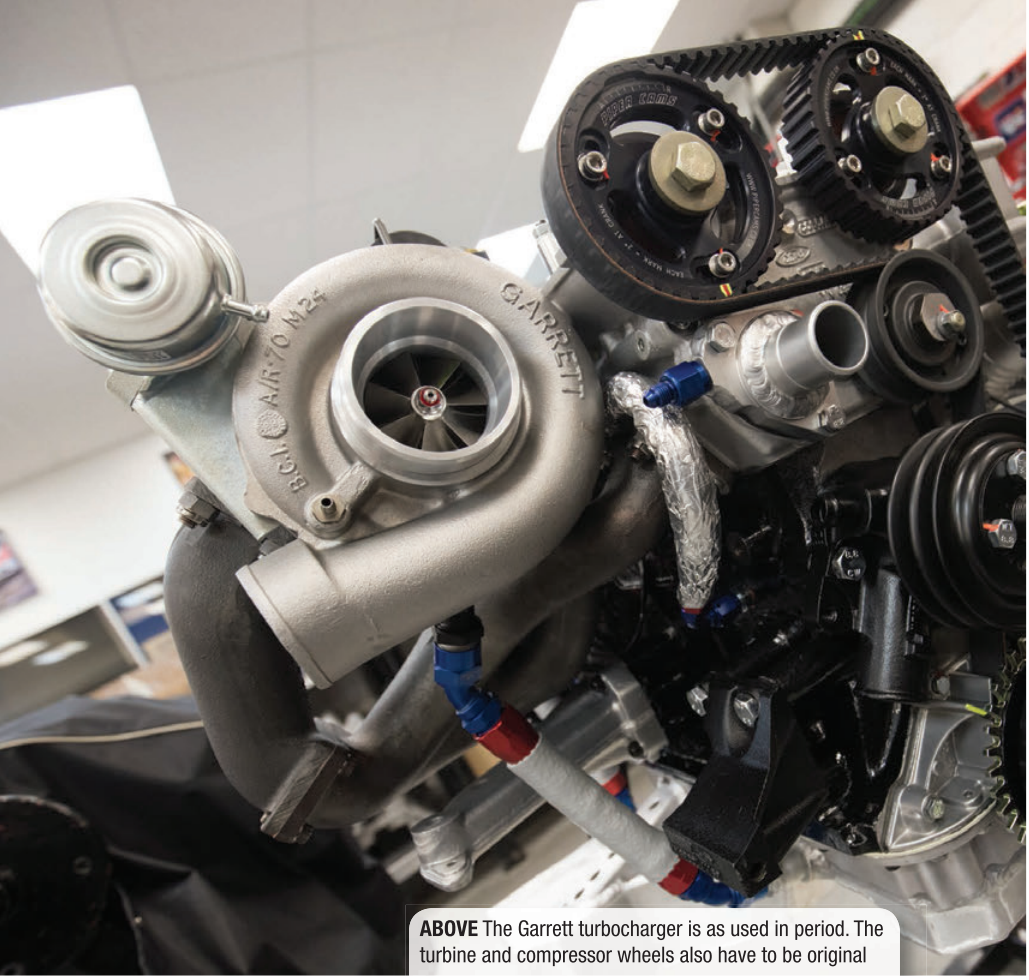
What Mountain didn't know at the time was that in early 1988, the Johnson team had homologated a modified Ford nine-inch axle for the Sierra to eliminate the car's drivetrain weakness that allowed the cars to be driven harder with less fear of failure. This was also seen as essential in Australia, which used standing starts compared to the rolling starts used in Europe.

"The Australians had also done some very interesting things with the engine," says Mountain. "Neil Lowe, who was their engineer, had done a lot of work on the sump and the oil system because it was a wet sump as the regulations, and they just got it right." He had also got to grips with the engine management system ahead of everyone else in Australia, becoming the first there with the expertise to burn EPROM chips for the Sierra Cosworths.

"What we did was build a new car, but we used all the suspension and all that technology. However, we did our own engine spec such as different compression and cams," says Mountain. "We kept with the Bosch system at the time because we managed through some help to understand where the data files were and how to map it because we couldn't get that information officially from Bosch, but it was a good system."



ABOVE Tech advances mean that with updated camshafts, pistons and rods, the YB now produces more power than it did in its pomp



ABOVE The Garrett turbocharger is as used in period. The turbine and compressor wheels also have to be original

Mountain reckons that there are something like 200 of his YBs around the world and with the explosion in historic racing, they are very much on the company's agenda once again.

"Andy Rouse built all his engines and I contacted Vic Drake, who was Andy's engine man, but both had moved on from motor racing. When Julian Thomas contacted us to do the engine [on the Kaliber-liveried RS500], we were delighted, so while it was originally built by Andy Rouse, what we've done is rebuild and up spec it. It's odd because we were battling it out with Andy in 1990.

"When we look back now at what we were running then, you can't believe it. You forget that in the last 28 years a lot has come on. We've updated the pistons, rods, camshafts and when you consider that our best engine produced 546 bhp which Gravett used to win the championship, we are running around 570 bhp now. However, we need to be careful with it because the cars are being entered in an invitation class in the Legends series and we've been told by Duncan Wiltshire, the organiser, that he is not going to allow the Sierra Cosworths to disappear into the distance. We therefore have both the cars on adjustable boost and have told the drivers to be sensible as they otherwise will not be allowed to race.

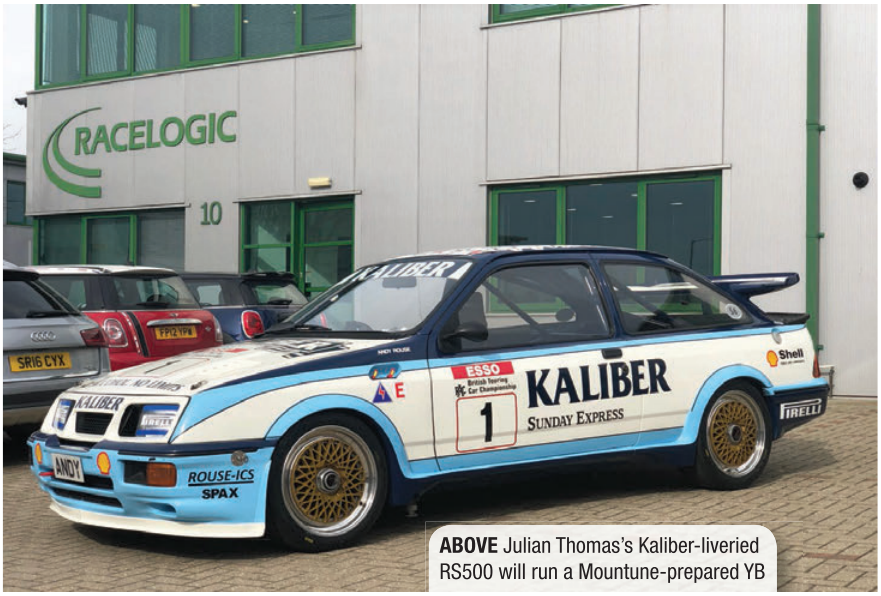
"Comparing a piston today to one 28 years ago, the material is more or less the same, the RR58 material, the Rolls-Royce material that was developed for the Merlin. It's still the strongest in pure strength terms, but basically the design has meant that we've reduced weight and friction and moved the ring pack higher up so that there's less chance of detonation around the top ring area. Traditionally we used to have a fairly tall ring land, which is where the detonation starts around the outside of the piston.

"Sealing these engines back then was quite a big problem. We used to have the Coopers O-ring system, whereas now we use multi-layered steel head gaskets. So we've really updated the engine, but the turbo has to be original, along with the turbine and compressor wheels. However, we are allowed to use new shafts and we have had to get some sump parts made and are looking at making other parts now because there are some things you can't buy."

START ISSUES CURED

Mountune has been forced to fit non-original ECUs to the ex-Edwards/Rouse and Gravett cars. "Andy Rouse always ran Zytek but because there is no support for that old ECU anymore and nor is there support for the old Bosch unit, we have fitted the Cosworth Pectel SQ6 ECU on both the Kaliber and Gravett engines," reports Mountain. "To a degree we have to keep things authentic but as we cannot get the original ECUs any longer, the feeling was that as long as it's out of sight underneath the dash, at least data logging and fault finding would be much easier while the engines run a lot nicer now. Starting these things in the day was an issue, whereas now they just start up and run like road cars. We have modernised it a bit, but if you look under the bonnet, it's pretty much how they did it in the day."

The first outing for the Kaliber car was due to be at the Goodwood Festival of Speed but the real campaign for both it and the Robb Gravett car is still yet to come. Who knows? It could lead to a renewal of the old era of Sierra Cosworth dominance. HRT



ABOVE Julian Thomas's Kaliber-liveried RS500 will run a Mountune-prepared YB



PROTECTION RACKET!

A din invariably accompanies any move to make historic racing safer but, as Masters founder Ron Maydon tells **William Kimberley**, organisers have a duty to protect racers from themselves!

RACING old cars is not new, long the domain of the enthusiast who bought him or herself a car and raced it in club events. There were few if any spectators; it was just the joy of competing against other vaguely similar cars of the same era.

In the last dozen years or so, though, historic racing has grown exponentially in terms of those racing, along with spectator attendance. If one considers the main motorsport events in the UK, top of the list is the British Grand Prix but then it's the Goodwood Festival of Speed, Silverstone Classic and Goodwood Revival. In some cases, it's pure nostalgia but for many it's the chance of seeing beautiful cars and enjoying the diversity.

One of those organisations behind the success of historic motorsport is Masters Historic Racing. In just 14 short years it has become synonymous with historic motor racing. Founded in 2004 with its Historic Formula One series, it has grown to become one of the leading organisers and promoters of international historic racing. Along with other historic event organisers such as Motor Racing Legends, Peter Auto of France and the SVRA in the US, what was once the domain of clubs organising relatively low-key events for their members has grown into a very large and buoyant industry.

This growth reflects the demographics



Photos: Jeff Bloxham

ABOVE & BELOW Accidents are part and parcel of racing, as Hugh Colman (above) and Sean Walker (below) will testify, which is why precautions have to be taken to protect drivers, cars and spectators

> **“No overtaking until after the first corner: sacrilegious to some, but there is a duty to enforce safety”**

(MIA) about one of his customers who had booked the Barcelona circuit for a week. He took four of his Formula 1 cars and two driving instructors to improve his chances at the Historic Grand Prix at Monaco.

What has also grown up with the advent of these professionally-run championships are those specialist companies that not only rebuild and refurbish historic cars, but basically provide an arrive-and-drive service for their customers. This side of the business has also exponentially grown as well.

However, the one thing that all the series organisers worry about is safety. As Maydon explains, back in the day ▶

of the sport which, generally speaking, are about the 55-year-old-plus people who have money to spend now that the mortgage has been paid, kids put through their education and things like that, meaning that it’s now time to indulge in something they might have long wanted to do. This is a generalisation, of course, but reflects the typical owner/driver who competes in historic racing.

HAPPY BIRTHDAY!

As Ron Maydon, founder and president of Masters, told me, one of his customers has bought a GT car for his 70th birthday present to himself as he felt he could having taken care of his family until now. He has bought it so that he can have some fun on the track with a car he watched race as a youth.

While most participants are enthusiasts, some take it far more seriously than others. Duncan Wiltshire, founder of Motor Racing Legends, told a business conference organised by the Motorsport Industry Association



when the cars were competing in their various championships, they were driven by young athletes at the peak of their powers. Without disparaging any of the very many fine drivers competing in historic racing, that peak has long been passed while the cars, nominally the same as driven back in the day, are now probably even more powerful thanks to modern technology.

QUICKER THAN EVER

This is not to say that the cars are illegal, but more replacement products along with things like lubricants and better grip tyres and so on have made them even quicker in many cases. The result is the scenario of quicker cars being driven by drivers who perhaps do not have the same wherewithal as they might have done 30 or 40 years ago.

Another factor is that while many of the cars on the grid have been well



Jeff Bloxham

ABOVE Rolling starts behind the pace car are a pragmatic safety measure introduced by Masters



Jeff Bloxham

ABOVE Instant hit: the cars in the Masters Endurance Legends series have modern safety features not seen elsewhere on historic grids



ABOVE The ever-popular Historic Formula One series is the cornerstone of Masters Historic Racing

maintained and in some cases rebuilt to a higher standard than when they first appeared on the scene, they can be decades old when the life of a racing car when being built is generally measured in months not years. What have become crucial tools in modern historic racing are things like condition testing, especially as aluminium can become brittle over time and crack in areas where it is stressed.

The issue for historic series organisers is that the cars cannot be modified to make them safer. It's not a question of a Halo being fitted, as with modern Formula 1 cars. They are raced as they were all those years ago. For Maydon, it therefore means damage limitation.

There are a variety of reasons why he wants to protect the drivers and their cars. The two main ones are that he doesn't want to see any of them hurt on a personal level or damage their wonderful cars, but there is also a financial aspect. If any driver is hurt or has had his car severely damaged, it means he won't be spending any money with him while he or the car is being repaired. As he says, "Part of my job is to protect the drivers and their cars from themselves and each other."

This is not a universally popular policy, some die-hard racers insisting that racing is racing and anyone who enters knows the score. They might get hurt or even killed, but no-one is forcing them to race.

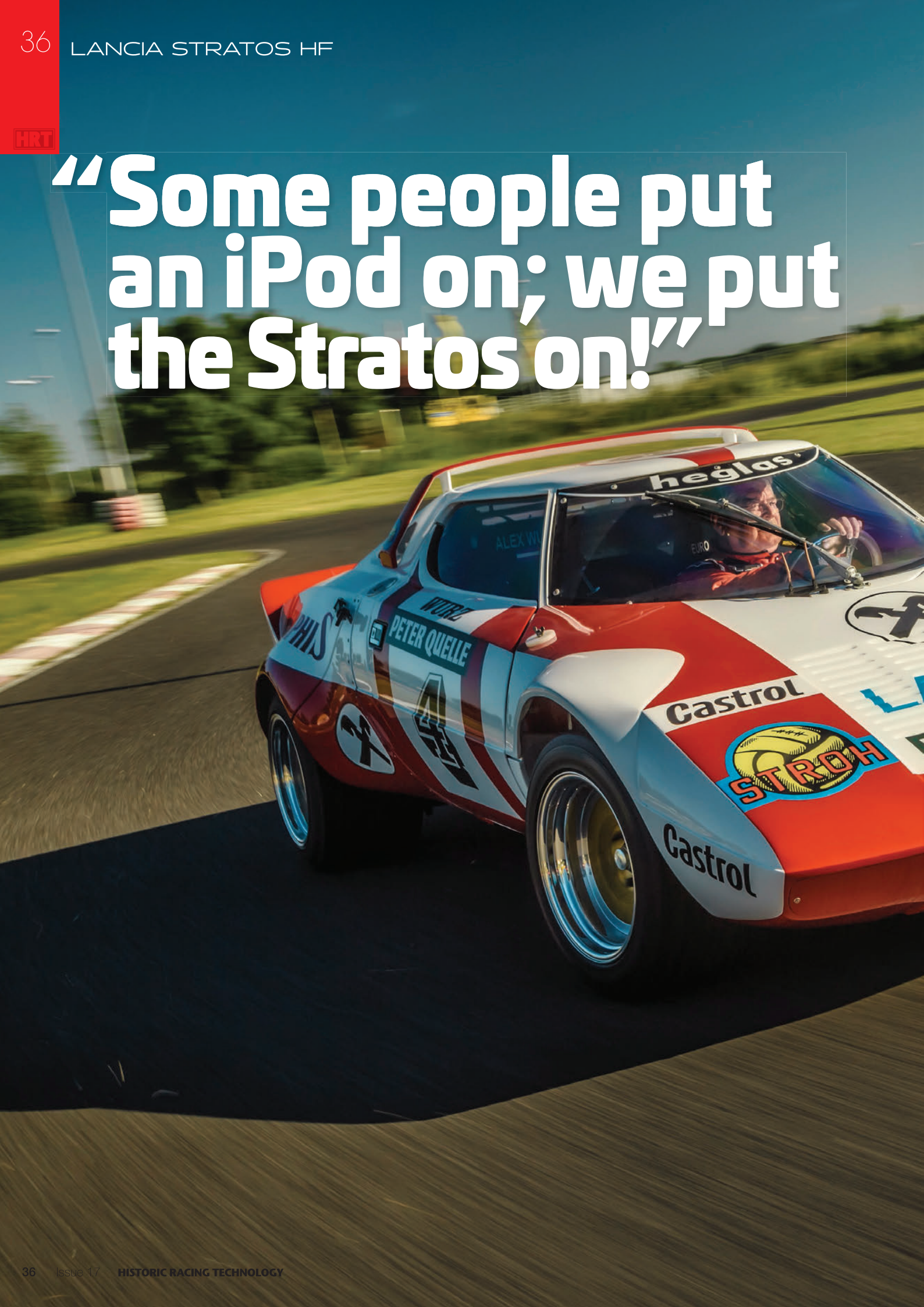
> **"The life of a racing car when being built is generally measured in months not years"**

Maydon takes a different view, knowing that many of his customers are racing for fun, are indulging in a lifelong passion but at the end of the day, don't want to get hurt doing it. As a result, Masters no longer has a standing start for its races as he considered them far too dangerous. There is also the stipulation about no overtaking until after the first corner. To some, this is sacrilegious, but Maydon considers it his duty to enforce safety wherever possible.

The beauty of historic racing, or the racing of "pre-owned" racing cars as Chris Aylett, CEO of the MIA, puts it, is growing and increasing year by year. Masters have recently introduced the Masters Endurance Legends series for cars that were racing from 1995 to as recently as 2012, which has proved an instant hit. As Maydon puts it, the cars may be very quick indeed, but being so modern, they also have many of the safety features and survival cells that older cars don't have and so are appealing to some drivers for that reason.

While modern motor racing is trying to find a secure future for itself, historic racing is going through a boom period. That transformation is helped by event organisers such as Masters easing the way for the growing number of individuals who want to participate and play out their boyhood dreams. HRT

"Some people put an iPod on; we put the Stratos on!"





Jürgen Strawan

ABOVE Even for a former F1 driver and Le Mans winner, the project to reunite his father with the Stratos has been exhilarating

Former F1 pilot and Le Mans winner Alex Wurz tells **Hal Ridge** about the restoration of the Lancia Stratos in which his father won the first ever FIA European rallycross crown

THERE are a multitude of reasons why individuals decide to compete in specific disciplines of motor racing, or indeed to restore or revive cars from the past for use in the present day.

Being son of a multiple champion is a valid enough reason in itself to want to restore a title-winning car, but to have been conceived at a circuit after one of your father's many successes gives even further credence.

Earlier this year, Formula 1 podium finisher and double Le Mans winner Alex Wurz made his debut in the World Rallycross Championship, in Norway. But that wasn't his most significant first public appearance in a front-running rallycross car. At the Goodwood Festival of Speed in 2016, Wurz drove the Lancia Stratos HF in which his father Franz won the first ever FIA European Rallycross Championship title in 1976.

"I grew up at rallycross tracks. I've known the sport from a child. I was actually conceived at a rallycross track after my father won in Sweden, but never mind, maybe that's too much information!" Alex laughs.

His father continued to race the ▶

Bertone-designed Stratos in 1977, switching to a unique 3.0-litre development engine, before selling the car to compatriot Andy Bentza for 1978. While Wurz raced a works Fiat 131 without success that following year, Bentza was runner-up to Martin Schanche in the iconic Stratos. Over 30 years later, Alex Wurz persuaded Bentza to sell the car back.

"Andy kept the car. He kept it forever and I always said to him, 'I want to buy it'. He always said, 'I'm not selling it'. That went on for years; 10 years at least," muses Wurz. "Then one day he called me and said, 'Look, I thought about it and if you want to buy the Stratos I would sell it to you because it's your family where it came from.' Then we negotiated for another few years for the price. When I got the car it still had all the original spare parts, the original moulds for the bodywork and so on. It was really original."

While the Stratos returned to the Wurz family ownership in period trim, Wurz Jnr wanted to be able to use the iconic machine in relative anger, rather than have a museum piece.

> **"If you're not the boss of the car, it scares you"**

"Basically, we got two cars in terms of spare parts, then we started renovating it with Rolf Schmidt. He's a very experienced mechanic from rally and rallycross and has a lot of hand-crafting skills. His brother is sensational with the gearboxes and engines; himself with the chassis. We spent the next two and a half years renovating the car," says Wurz. "We wanted to make it like the original, but yet completely renovated so it can be used. I had the choice to leave it as I picked it up from Andy, which was fine because it was running, but I decided no, let's do it all, so we had to go all in. It was a big job done and it's a lovely machine. I enjoyed the entire process of the renovation as much as I enjoy driving the car now."

BATTERED CHAMPION

The first stage of that process was to strip the Stratos to a bare shell, to effect repairs to some of the extensive 'wear and tear' from years of door-to-door action. Not only that, but the rallycross circuits of today bear little resemblance to the unsealed sections of tracks in the '70s and '80s, where the rough stuff really was just that.

"The car was in quite bad shape, so if you would have gone on a classic event and driven through a hole, we probably would have lost the whole of the front of the car. We kept it as original as possible, then replaced the parts which were needed," ▶



Jürgen Strawan



Hal Ridge

ABOVE An aluminium stay on the hydraulic-handbrake lever is a neat addition

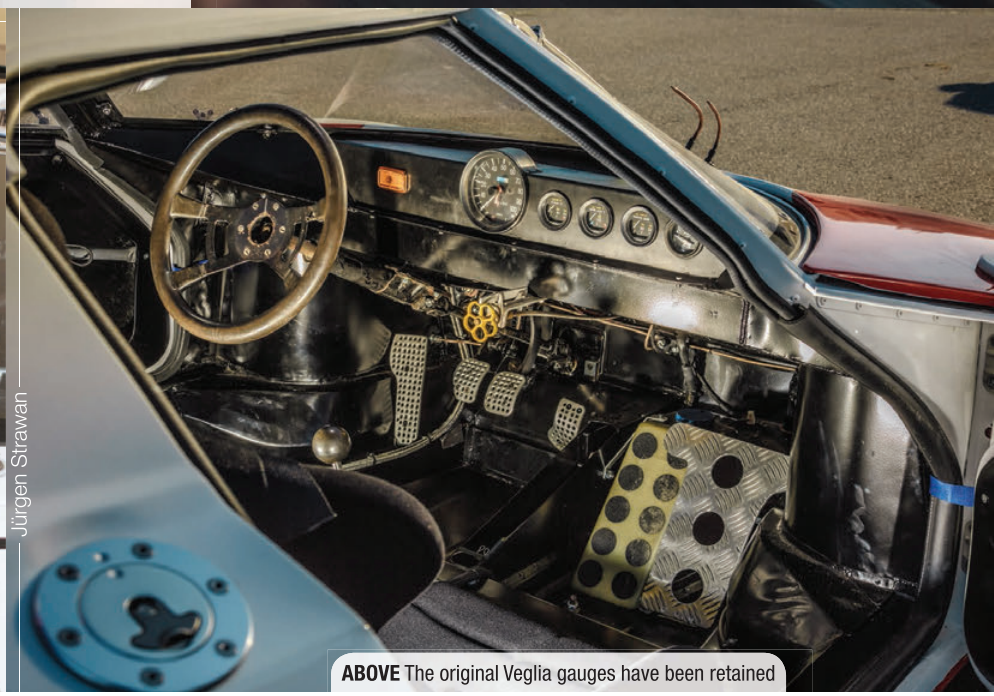
ABOVE The super-agile Stratos has always rewarded those brave enough to take the car to the limit

Hal Ridge



ABOVE Yes, this really *was* a state of the art wiper system back in the day

Jürgen Strawan



ABOVE The original Veglia gauges have been retained

says Wurz. Substantial work went into sculpting and replacing sections of the chassis steelwork, while the composite bodywork, including the front and rear clams, was completely replaced, partly to make the car as fresh as possible but also to retain the heritage of the period parts.

"It's completely new bodywork. I have the original pieces, but it's just bashed to pieces from rallycross," he admits. "The doors are the originals, but the rest is new. Some of the parts my dad still remembers someone crashing into him you know, [Stig] Blomqvist or someone. I wanted to keep those parts, not throw them away. For example, the top is a bit damaged because he rolled, and I said, 'We have to keep this, as long as the car stands straight this is the history and you can tell this story with it'."

Adaptions to the car from its rally Group 5 origin for rallycross included a smaller fuel tank and plastic windscreen to save weight, while the bodywork was also strengthened and lightened. In an attempt to improve visibility in dirty and muddy rallycross racing conditions, a 'special' windscreen washer system was rigged up, typical on rallycross cars of the era, which has been retained, a pair of copper pipes firing water at the screen. Under the skin, the Italian machine's engine and gearbox were also restored, using "99%" original internals, with new seals and bearings to ensure longevity and reliability.

While every Stratos has an exciting aura thanks to its spaceship-esque appearance, wild performance and roaring naturally-aspirated V6 sound, this specimen is extra special. And not just because of its title-winning CV.

SPECIAL ENGINE

The transverse, mid-mounted engine in the Wurz Stratos, which is now adorned in its period 1976 livery, is the 2418 cc version of the Ferrari Dino 65-degree V6 that Wurz used to win the '76 crown, first using a 12-valve head and later a 24-valve version in the 10-round season. Boasting an aluminium block and cylinder head, the 2.4-litre motor has a bore of 92.5 ▶









ABOVE & BELOW Years of battering in rallycross had taken their toll by the time the car came back into the Wurz family

KONI

Adaptability. Activated.

NEW! KONI Special ACTIVE is the latest innovation in premium shock absorber development. It offers superior handling to cars, light trucks and SUVs for both daily and dynamic driving, all without compromising comfort. Just as a chameleon adapts to its environment, KONI Special ACTIVE transforms to suit various road conditions, instinctively.

PERFORMANCE SHOCK ABSORBERS | koni.com

EARL'S
PERFORMANCE PRODUCTS

CUSTOM BRAKE LINES | OIL COOLERS | HOSE | FITTINGS
ADAPTERS | FILTERS | NOS | FUEL PUMPS & REGULATORS



FUELAB NOS Holley pumps EARL'S PERFORMANCE PRODUCTS ADEL WIGGINS STÄUBLI

Visit www.earls.co.uk for the full range
Online Shop now Available

QUOTE "RTech2013" WHEN ORDERING TO RECEIVE DISCOUNT

Earl's Performance Products UK Ltd
Units 15-16 Silverstone Circuit, Northants, United Kingdom NN12 8TL

+44(0) 1327 858221 | sales@earls.co.uk

VARLEY RED TOP™



The Varley Red Top range of Racing Batteries has been the professional choice for over 60 years. The latest products in the range have been designed to meet the requirements of both major teams and the regular club racer. These batteries are available through our worldwide network of dedicated motorsport distributors, ensuring that our products are fully supported.

To find your local distributor, or to download technical support information, please visit :

www.varleyredtop.com



ABOVE The Stratos was 'like a UFO' when it first appeared in the rallycross paddock. Even now, it's not hard to see why

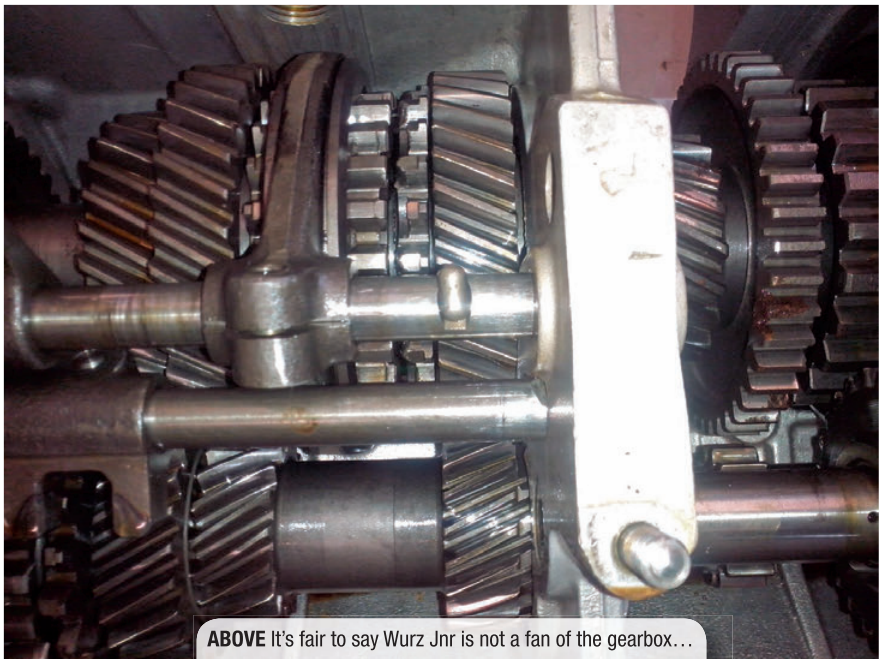
> **"The gearbox is mind-blowingly bad: you need to be Arnold Schwarzenegger to change gears!"**

mm, a stroke of 60.0 mm and uses a trio of Weber 48 IDF carburettors, producing in the region of 280 horsepower and a similar amount of torque.

For the following term, 1977, Wurz was blessed with a bespoke Mike Parkes-designed 3.0-litre motor as part of a factory sponsorship deal. "The engine in the car is the original how it was delivered from Turin (Lancia's assembly plant)," says Alex. "That one was tuned to be the race engine and won European championship races, but then my dad got the 3.0-litre engine from the factory. This was the 2.4-litre V6 Dino engine but enlarged in volume [having a bore of 96.0 mm and a stroke of 69.0 mm, using a four-valve head]. It was really an extreme job they did and it's a real rallycross engine. It's not reliable enough for a rally: it has significantly more power and grunt; at the bottom end it's much better to drive.

"The 3.0-litre engine is quite cool because there is only one existing. We have the original engine dyno sheet, from the same engine dyno where the Ferrari engine was done. We still have the letter between Cesare Fiorio (Lancia rally boss), the engine tuner, my dad and the sponsor. What we have with this car is very cool: as a family we can relive the golden age of it and of rallycross. I'm very happy that we still have that special engine."

As the 3.0-litre unit is a one-off, and has ▶



ABOVE It's fair to say Wurz Jnr is not a fan of the gearbox…

ACCRALITE
Incorporating
Accralite Pistons
as a division of
Omega Pistons Ltd.

Omega Pistons Ltd.
Oak Barn Road
Halesowen
West Midlands
B62 9DW

Tel: 0121 559 6778
Fax: 0121 559 6779

E-Mail: info@omegapistons.com
Web: www.omegapistons.com

OMEGA PISTONS



Image courtesy of Eddy Perk

Omega Pistons Ltd. have been producing high performance pistons for over 40 years for classic and modern engines of all types.
Our manufacturing methods enable us to re-produce almost any type of piston required.
We are unique in the U.K. for being the only company to produce on-site forgings, castings, piston rings and gudgeon pins.

WESTWOOD
CYLINDER LINERS

Modern, Classic, Historic, Vintage,
Veteran Car and Motorcycle Engines

- All types of cylinder liners manufactured to order
- Available in standard cast iron or ductile iron
- No minimum order quantity
- Work from dimensions, drawings or samples
- Over 25,000 liners in stock
- Direct shipping throughout the world



Westwood Cylinder Liners Limited
Tel: +44 (0)1905 799470 **Fax:** +44 (0)1905 796414
Email: sales@westwoodcylinderliners.co.uk **Web:** www.westwoodcylinderliners.co.uk

the aforementioned lesser reliability, its 'little' 2.4 brother is fitted in the Stratos for current use. "It just runs super-easy and it's not so labour-intensive when I just go for a bash and a drift session," he grins.

As part of the restoration, Wurz laid his hands on fresh radiators, not abused by competing in rallycross events, and added an alternator. "My dad raced without the alternator to save weight but it's good to have one," he suggests. "We can change it back to how it was if we want to."

The five-speed, H-pattern ZF Lancia gearbox, attached to the left side of the engine, has two options of drop-gears to alter top speed. The differential, at the rear of the snug engine compartment, is shrouded by the Bossato exhaust manifold from the engine's rear bank of cylinders.

Also at the rear, MacPherson suspension with a lower A-arm connects the aluminium uprights to the rear-wheel drive machine's chassis. A double-wishbone arrangement is used at the front, coupled with steel standard front ▶





ABOVE & BELOW Two and a half years of painstaking work went into the restoration



Jürgen Strawan

ABOVE Franz Wurz takes a walk he never imagined possible: four decades on from driving the car to victory in the inaugural FIA European Rallycross Championship, he prepares to return to action

JOIN OUR WORLD FAMOUS TEAM



JSWL

Skilled Mechanic
To work within our workshop at JSWL

Engine Builder
To work within our engine shop at JSWL

SOUTHSHORE COACHWORKS

Coachbuilder
With english wheel experience to work within our bodywork division.

If you have experience of historic cars and a passion for them we would love to hear from you.
For the most committed and experienced individuals we offer competitive pay and benefits.

To discuss any of the above positions please contact our Human Resources department *quoting reference:* **HRT02**
Telephone: **02392 254 488** *Email:* **hr@jswl.co.uk**

HISTORIC QUALIFIER

No one offers more Rod Ends and Spherical Bearings for historic and vintage applications.



Aurora Bearing Company
901 Aucutt Road
Montgomery IL. 60538

AURORA ®

Complete library of cad drawings and 3D models available at:
www.aurorabearing.com

Ph: 630-859-2030

www.RetroRacecar.com

Watanabe RACING SERVICE SOLE AGENT EUROPE

Stock & Custom Magnesium Wheels





Jürgen Strawan

ABOVE & RIGHT The 'baby' 2.4-litre V6 Dino engine, still a potent weapon, is used in preference to the 3.0-litre Ferrari factory unit

uprights, connected by a rack and pinion steering rack. The car has two sets of dampers at its disposal: Konis for low ride-height running; Bilsteins for when the car needs increased ground clearance. Both sets used Eibach steel-coiled springs.

"AWFUL NOISES"

The brakes remain in as-period specification, with three-pot Girling callipers at the front with 267 x 16 mm discs and ATE two-pot callipers accompanying 270 x 20 mm discs at the rear. They are, according to the super-experienced Wurz, adequate for stopping the 840 kg machine. But he is less keen on the transmission – hardly surprising given the advance in technology over the last four decades.

"The brakes are all cool, but what is really mind-blowingly bad is the gearbox!" he opines. "You kind of need to be Arnold Schwarzenegger to change gears. You just have to whack them in and it makes awful noises. It's very slow, but all the gearboxes in the old days were like this.

"Nowadays (in modern cars) I just blip a little paddle and the gear's in with no transmission interruption; of course we are talking of day and night. That's the biggest difference that I feel of those cars of the seventies to now. Sure, steering feedback and all of those things are better too, but you can get your head around those. Gear shifting is the most awkward."

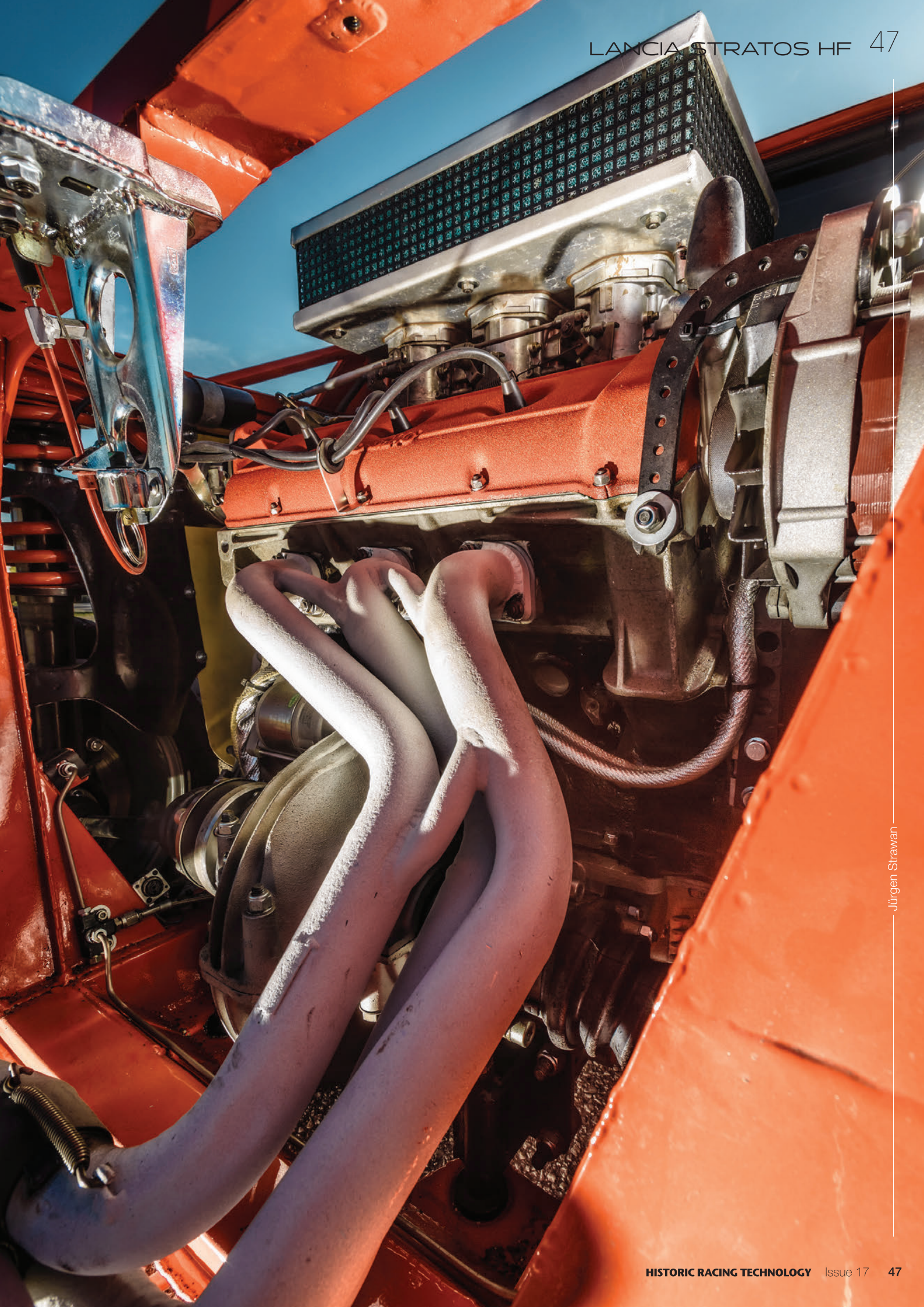
Inside, the car now features a pair of seats – so the experience can be enjoyed from both sides of the car, rather than the solo affair of rallycross competition – while the safety features have been brought up to a specification suitable for historic events. There are interesting detail additions too, one of which begins on the hydraulic-handbrake lever located between the left-hand drive driver's seat and the door. An aluminium stay has been installed to enable the handbrake to be left on and not 'fly-off' at will.

"We have a modern fire extinguisher, harnesses [both OMP] and a safety fuel tank [increased from 10-litre in period rallycross trim to 35 litres today to allow for increased running times] to comply to modern historic event regulations," notes Wurz. The fuel tank located behind the driver's compartment is accompanied by a pair of Facet fuel pumps and a Varley Red Top 30 (DMS) battery. "I have all the original parts still there, but I wanted to make it user-friendly for modern days yet still keep the spirit."

The wiring loom has also been replaced with a modern version, again to ensure reliability and safety. However, the original Veglia gauges on the dashboard – spread across the width of the car for revs, oil, water temperature, oil pressure and fuel level – have been retained.

> **"It was okay to find the parts. It was more difficult to negotiate the prices"**

The attention to detail in this project hasn't been solely confined to the work undertaken by Schmidt, for it has also been applied to sourcing the required components. "It was okay to find the parts. It was more difficult to negotiate the prices, because any part from a ▶



Jürgen Strawan



ABOVE Alex Wurz has been on a mission to restore his father's title-winning machine

Stratos is stratospherically expensive," Wurz laughs. "But in the end, I didn't want to compromise too much.

"We made a mistake because the rims were an inch wrong. We thought the measurement was within the rim but it wasn't, so two months ago I said, 'No, it cannot be like this'. So, we had to change the entire sidepod, bodywork, rims so it's exactly as my dad raced it."

The car now sits on 15 x 7" wheels on the front (with 235/45 tyres) and 15 x 10" (305/45 tyres) on the rear. "My dad loved



Jürgen Strawan

ABOVE The composite bodywork, including the front and rear clams, was completely replaced





ABOVE Extensive effort went into replacing sections of the steel chassis



the rear wide tyres: they're a bit better at the start," says Wurz. "Andy always kept the narrow tyres and he always had the car very high, like it was on the Safari Rally, because we could run the kerbs; my dad always wanted it low."

Although he admits to enjoying every stage of the reconstruction, Wurz concedes that driving the Stratos has been a special experience – even for a former Formula 1 driver, Le Mans winner and now sometime World Rallycross driver.

WOW FACTOR

"It's special to drive because I've seen my dad and Andy performing in it," he says. "Back in the day these were like UFOs entering the paddock; still nowadays you stand in front of the car and think, 'Wow' – or at least I do. To drive it's actually very difficult. If you just cruise around to start slowly, it doesn't want to drive straight, it doesn't go where you want and you think you have to check if the setup is correct. But when you start driving hard, brake hard and always keep the foot on the gas, keep it on a little drift, then it all makes sense.

"It's super-agile. The steering is extremely reactive and I like that, but you really have to go to where the car is designed for, which is the limit. I've talked to all the guys who drove the Stratos, like [Walter] Röhrl and so on, and they all say the same: when you roll out you think, 'My god', but when you start pushing it all makes sense. If you're not the boss of the car, it scares you."

Aside from driving it for the first time at the 2016 Festival of Speed, joined by both his father and Bentza, Wurz has also experienced the title-winning car on a real rallycross circuit.

"Goodwood was quite nice because Lord March sent us a letter to invite us with the car. He said he'd seen it as a child when he watched my dad, so it made it very special," he says. "I also drove it at Fuglau (in Austria) at a national event as a showcase. I was quite sad when they showed me the chequered flag because the track was perfect: slightly dusty and slippery to just keep the rear out. It was proper cool. It wasn't too bumpy either which was good, because that was the weakness of the car. When it was bumpy the rear always jumped very high. But, it is what it is."

Indeed, it is. And today it is a work of art, arguably in the best condition it's ever been. While Wurz Jnr and Snr are content with driving their heirloom with the original 2.4-litre motor, will the special 3.0-litre unit ever be re-mated to its former companion?

"The 3.0 is mainly just to have," concludes Wurz. "Sometimes I say to my dad, 'Let's put the 3.0-litre in, it sounds just a bit strong, cooler, more aggressive'. But I love it with both engines. Some people put an iPod on; we put the Stratos on." HRT

FROM MOUNT PANORAMA TO THE MULSANNE

Andy Swift examines a 1960s sports car with a race pedigree that spans three continents

FEW racing cars can boast a history which includes competing at both Bathurst and Le Mans, but the evergreen TVR Grantura of Colin and Helen Elstrop is one of that elite band.

Their car is a Grantura Mk III, chassis 9/686, which was supplied in kit form to Australia in 1964, when punitive taxation on factory-built sports cars made kits from the likes of Lotus and TVR very attractive in the Antipodes, as well as the UK. It was imported by Peter Owen, who dealt in aftermarket wheels and tyres in Sydney and unwittingly became TVR's Australian importer in the process. Given the paucity of Granturas in Australia at the time, it ended up on display at the 1964 Sydney Motor Show, as well as becoming the de facto press



Jeff Bloxham



car for motoring journalists in that part of the world.

More importantly, it also raced extensively through the 1960s, including appearances at Bathurst, Warwick Farm and at Surfer's Paradise on the Tasman support bill. A scan of the race programme from Surfer's reveals a veritable feast of world talent who may have seen the Grantura in action. Eventually the car became less competitive and passed through a number of owners before falling into dilapidation – though not before being resprayed grey and gaining steroidal arches to cover wider rear tyres.

The car was built originally by Les Merrick – who actually travelled to Le Mans from Australia in 2012 for a reunion – and was subsequently prepared for historic racing in Australia in 1994 by Kevin Smeaton. It saw little action, though, and in 2003 Christophe Wilmart imported the TVR to France before undertaking a sympathetic restoration to Appendix K specification. Wilmart used the car in one Equipe GTS race before selling to the Elstrops.

Since 2007, 9/686 has resided at the Elstrops' workshop in the beautiful County Durham wilderness, where Elstrop prepares the car himself. He started driving as a child, learning the art of oversteer in the highly unusual three-wheeled Frisky which he retains to this day. He attributes much of his ingrained car control to those early times, sliding the sole rear wheel around the fields. Today he spends most of his working week at Silverstone, instructing for Porsche at its driving centre just off the Hangar Straight.



ABOVE & BELOW Although the Grantura's conquests include the Mount Panorama circuit at Bathurst (top right), many of its long-distance exploits now take place at Le Mans (below)

> "The roof has a habit of lifting at speed in a Grantura"

INTRIGUING RUMOUR

The Grantura carries an Historic Technical Passport, granted by Jim Lowry, and is prepared strictly to FIA Appendix K. The Elstrops prefer to use it in longer races such as the Le Mans Classic and Equipe GTS mini enduros – and the car's preparation reflects that.

The cars were supplied originally with a BMC 1800 cc B-Series engine, with 9/686 found to be running the block from a Land Crab. Colin mentions a persistent rumour that this engine had been left in Australia by BMC after the 1968 London to Sydney Marathon. It's an intriguing by-line to the car's history, though unlikely ever to be verified.

During preparation, Elstrop found the compression almost at zero on one cylinder and discovered the ringland had cracked. He took the decision to build up a new engine from an MGB block, using the most modern block he could procure, experience having taught him that the last units in a production run tend to be the best-sorted.

The original engine featured an HRG Derrington crossflow head but the new unit possessed a works-type head with siamesed ports. This dictated the use of a scatter pattern cam profile which is not required on the crossflow engines. Problems have been encountered previously with holes in blocks requiring cylinder liners to be installed – believed to be traced back to quality control problems from manufacturing abroad.

The car retains its original steel radiator, though it has been rebuilt after early overheating problems. The refurbishment was undertaken by Banks of Newcastle using, unusually, the core from a forklift truck. Aluminium cored radiators are not permitted under Appendix K regulations but Elstrop has been able to augment the radiator with a dual electric fan which ▶



ABOVE A new engine was built around the most modern MGB block that could be procured

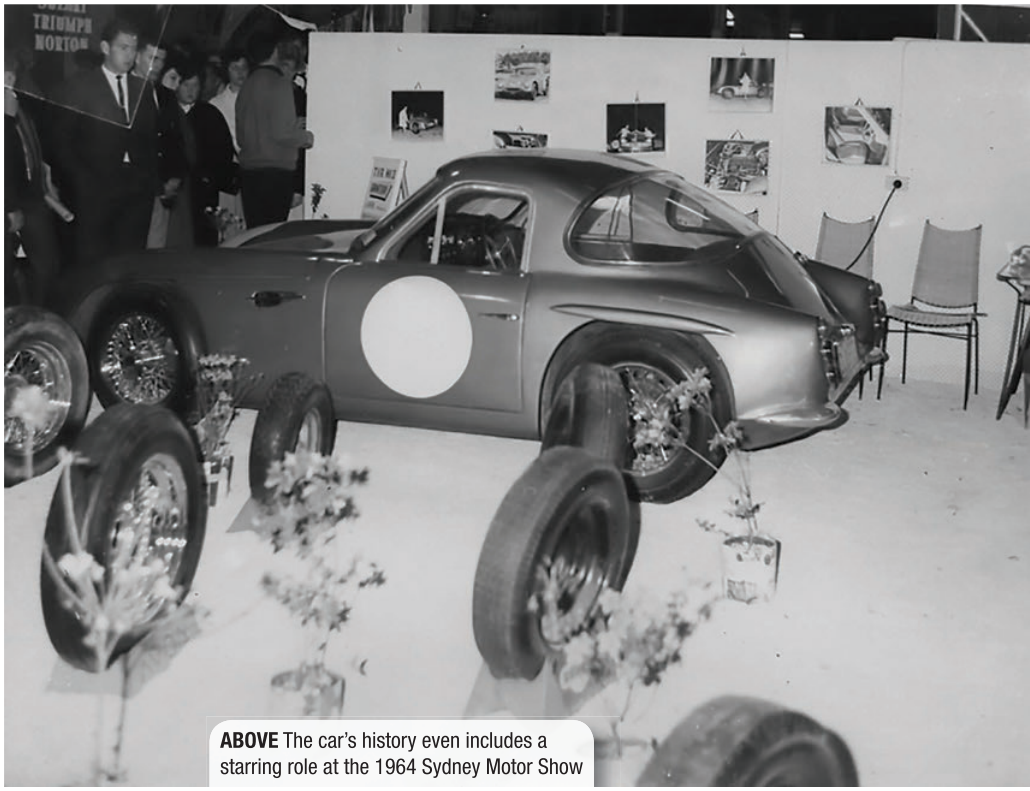
is particularly helpful during long sessions queuing at sweltering circuits. Heat also drove the move to a roller bearing clutch release bearing instead of the carbon thrust type.

Elstrop has built the engine with durability in mind and that means limiting engine revolutions. Set up for tractability, the TVR pulls strongly from 3,500 rpm to 6,500 rpm where some competitors seek greater top end power with 7,500 rpm rev limits. Elstrop aims for 20 to 30 hours running between rebuilds, but undertakes an oil change after every race meeting – this being especially important due to the amount of track time at the kind of events where he uses the car.

ETHANOL CONTENT

He now uses fully synthetic oils after finding that mineral oils were causing big end knock due to a lack of zinc. He is currently weighing up whether to move to running the Grantura on Sunoco race fuel. While this comes at a price – up to double that of superunleaded 'pump' petrol – he finds himself having to perform a routine biennial change of all rubber fuel hoses. The hoses are prone to losing flexibility due to the ethanol content in pump fuel. He expresses some caution over using old fuels and in fact gives a tip-off that Silverstone's on-site petrol station is used by many competitors simply because the tanks are emptied and filled regularly, meaning stored fuel never sits for long.

Especially when one considers its relatively prosaic roots as a kit car, 9/686 has competed a remarkable number at times at La Sarthe. Helen and Colin have raced in the Le Mans Legends event on the 24 Heures support bill, as well as at the major Peter Auto Le Mans Classic biennial bonanza. The unique nature of the historic road course has seen the couple optimising the car for the circuit.



ABOVE The car's history even includes a starring role at the 1964 Sydney Motor Show

Modern technological trickery is outlawed – and that extends to the headlights. No LEDs are allowed, let alone LMP1 Audi-aping lasers, so that means more traditional Cibie units with extra bright halogen bulbs. Even so, visibility is a challenge, claims Elstrop wide-eyed: "Some areas like the Mulsanne are illuminated but out towards Indianapolis it's very dark and your only help is the borrowed light from other cars."

Both Le Mans events permit two drivers and there is a minimum pit stop time. This means the team isn't forced to push safety too far in the name of a speedy stop. A seat insert is installed for drivers differing in size but otherwise scheduled pit visits might include a tweak of the shock rates and little else. Elstrop uses a Simpson HANS-type device which is replaceable every five years. While historic racers are exempt from having to wear a HANS device, Elstrop does so willingly and has chosen the Simpson support because it offers some lateral restraint, as well as being less bulky than some units on the market which makes for easier driver changes.

Most Granturas run a 4:3 ratio in the differential, while 9/686 runs as normal on a 4:1; for Le Mans a 3.9:1 is employed, which is a standard MGB ratio. For Le Mans Legends in 2015, the organisers permitted 550 diameter tyres, effectively giving a taller final drive. "Nowhere else is your foot flat to the floor for so long; the change of tyre diameter brought the revs to just the right level for the Mulsanne Straight," confirms Elstrop.

TYRE TRANSFORMATION

The FIA permits 5" or 6" tyres and the Grantura now runs 6" rubber. Almost all races mandate the use of Dunlop tyres though Elstrop recalls one very wet Le Mans where a late decision was taken to allow competitors to race on any road legal tyres of their choice. "In South ▶

Jeff Bloxham



ABOVE While its owners chase performance and durability wherever they can, the Grantura's competitiveness will always be hampered by its weight

Africa we used Avon CR6ZZs and they totally transformed the car," he notes. Radial Avons are also used at the Spa Six Hours marathon.

As the 2012 tyre travails confirm, Le Mans often brings extreme weather. Elstrop laments that the Grantura's windscreen wiper is not terribly effective at high speed (something one experiences rather often around La Sarthe), so he uses Rain-X on the outside of glass and anti-mist on the inside to give the drivers a fighting chance during a downpour.

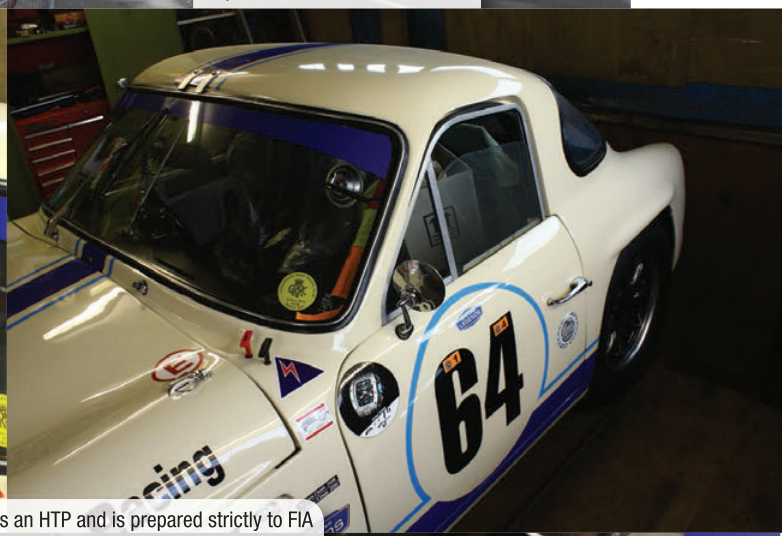
SUDDEN BREEZE

During the sweltering 2010 running of the Le Mans Classic, Elstrop became aware of a sudden breeze in the cockpit. The roof has a habit of lifting at speed in a Grantura and as a result is fixed to the dashboard by a vertical steel brace. The extreme heat had ▶



ABOVE The car is well-travelled, including forays to Killarney in Cape Town, South Africa





ABOVE & BELOW The Grantura carries an HTP and is prepared strictly to FIA Appendix K. The wiper, incidentally, isn't hugely effective at high speed





Established 1967

Mathwall ENGINEERING

Racing Engines



Specialists in Ford and Chevrolet V8 Engines

High performance specifications developed for -

- Ford 289 FIA
- GM 302/327/350 FIA
- Complete engines & upgrades
- All applications
- MSA engine sealing offered

Additional services offered –

- Design, development, manufacturing
- Dyno & rig testing
- Road car engines
- Wet/dry sump oil systems
- Direct sales of components

Quality

Technical excellence

Outstanding service

Call us on +44 (0)1252 703191 *info@mathwall.co.uk* *www.mathwall.co.uk*

FUEL SAFE Racing Cells

- FiA FT3 Certified Fuel Cells & Accessories
- Short Lead Times for Stock or Custom Parts
- Fitting Service Available
- Superior Seamless Construction Technology
- Special Large Capacity Fuel Cells for Endurance Events



Classic World Racing

www.classicworldracing.co.uk

Tel: +44(0)1527 521050

Nigel Reuben Racing



We build current FiA compliant cars
All Classic TVR Spares Available
35 Years Classic TVR Experience

www.nigelreubenracing.com



Tel: 01299 851341 | Mobile: 07974 666641

softened the dashboard plastic enough to allow the roof to lift. He was forced to fabricate a secondary bracket to keep the dashboard in its intended location during hot races. For personal comfort, he also keeps a lightweight race suit and cooler fireproof underwear for use during long, hot stints.

If the high speeds and extreme weather have caused issues for the Elstrops at Le Mans, the couple found themselves facing challenges as a result of the altitude during a foray to South Africa for the Springbok Revival Series in 2017.

> **“Alarmingly, the pedal went to the floor on the slowing down lap”**

Zwartkops circuit sits 6,500 metres above sea level and Elstrop turned to the local racers for advice. Upon their guidance, he leaned off the mixture and used bigger air correctors on the carburettors. He also advanced the timing but even so he found the car felt very asthmatic.

Rather more surprising was the effect on the TVR’s braking system. The Grantura runs discs up front and drums on the rear. In spite of using fresh brake fluid before the race, the front circuit boiled as a result of the lower boiling point at altitude. Alarmingly, the pedal went to the floor on the slowing down lap and Elstrop speculates on whether the thinner air also led to a reduced volume of air to cool the system.

Away from the outlier challenges of Le Mans and South Africa, Elstrop is quick to point out that 9/686 will never be truly competitive due to its weight: “It’s about 90 kg heavier than the lightweight cars.” In spite of that, he will still chase performance and reliability where he can.

While the minimum ground clearance is set by the FIA – preventing belly-scraping suspension arrangements – careful chassis tuning is still possible. The rear tracking is especially important on a car with such a short wheelbase. He maintains the same tracking settings except when running the radial Avons at Spa, when tweaks are required to maintain rear stability.

ADJUSTABILITY

Two front anti-roll bars were homologated in period – though none for the rear – and these interact with one-way adjustable dampers. With scope for adjusting only the stiffness, dampers must be steel-bodied and oil-filled. Elstrop confirms that there’s enough adjustability available to make it worth softening the shocks in wet weather and stiffening them for very smooth layouts. Spring rates can be changed and finding the right set-up is really a case of trial and error for each circuit.

The Grantura Mk III is a mix of BMC proprietary parts and TVR bespoke items but Elstrop confirms that obtaining spares isn’t a problem. The front end of



Photos: Jeff Bloxham





ABOVE Visibility can be a challenge on some parts of the Le Mans circuit



ABOVE & BELOW The car's preparation is tailored towards extracting the most from endurance races, with Le Mans featuring prominently on the calendar







the car employs Triumph GT6 uprights and TR4 stub axles, while the rear features TVR's own uprights and shafts with TR4 drive flanges.

In spite of the quantum of proprietary componentry, Elstrop is wary of purchasing unverified materials. He visibly tenses when recounting the moment a vertical link snapped at high speed – believed to have been a cheap part manufactured in Turkey. Today, he sources as many bits as possible from known TVR guru Nigel Reuben, whose components are developed on his fearsome Griffiths. If it will stand the forces applied by a 289 Ford V8 then a BMC B-Series should present no trouble.

As we leave the Elstrops, they are preparing for the season ahead. The second engine is undergoing a rebuild but the calendar remains fluid. As an Appendix K pre-'66 GT car, the Grantura makes a case for being one of the most eligible cars in historic racing. 9/686 is among the most fascinating cars of its type, now boasting a race pedigree spread over three continents – almost unheard of for all but the most exotic machinery.

Don't bet against Colin and Helen finding the chance to challenge themselves on a fourth continent in years to come. In the meantime they'll continue to plunge through the darkness at Spa and Le Mans in the true spirit of endurance sports car racing. HRT



NEVER-ENDING ENGINE TUNING

Ford's 289 V8 has been tuned for racing for more than 50 years, but as **Alan Stoddart** discovers, a combination of ingenuity and cutting edge techniques means that improvements are still being made

FINISHING at the front of a historic race at the Goodwood Revival or the Le Mans Classic is no mean feat. Aside from the enormous skill (and what often seems like superhuman bravery from the drivers), the cars themselves have to be set up just so, with everything scrutinised and perfected to make sure that every ounce of performance can be eked out and depended upon on the final lap of a hard-fought battle to the chequered flag.

Nowhere is this process of continual refinement more thorough than within the engine, and thanks to modern techniques and the seemingly never-ending innovation of skilful engineers working at specialists, engineers are able to bring about improvements on engines that have already been honed for more than 50 years, even if the 50 years of fettling have been carried out at the same company. This has been the case for Mathwall, which has been race preparing the Ford 289 and Chevy V8 engines since it was first opened by the current owner's father in 1967.

There have been some things that have changed over that time though. When the current owner, Mark Mathieson, who has a background in Formula 1, took over in 2007 he wanted to use the modern techniques from motorsport's fastest category at Mathwall, and so developed a part of the business focused on engineering services. This side of the business works on everything from innovative oil systems, including one that received government funding through the Niche Vehicle Network , to supporting process efficiency improvements by equipment redesign. This division is able to adapt and use its testing equipment to seek out small gains in specific systems within an engine and test out new ideas to learn about places where future advantages might be found.

Mathwall is also able to use this engineering services side for its own gain, giving it an edge when it comes to tweaking those Ford 289 engines that it started with all that time ago. One of the machines that gives the company options is the SpinTron. "It's basically a large electric motor," explains Mark Webb, Mathwall's chief engineer. "It tends to be used a lot for valvetrain development because if you get it wrong you are not going to trash a complete engine.

"This makes it ideal for the historic side. If we wanted to make a new cam or test out new springs here is a good place to do it. We can also strain gauge



ABOVE Mathwall is not only helping to keep legends like '60s Mustangs racing, it is ensuring they run better than ever

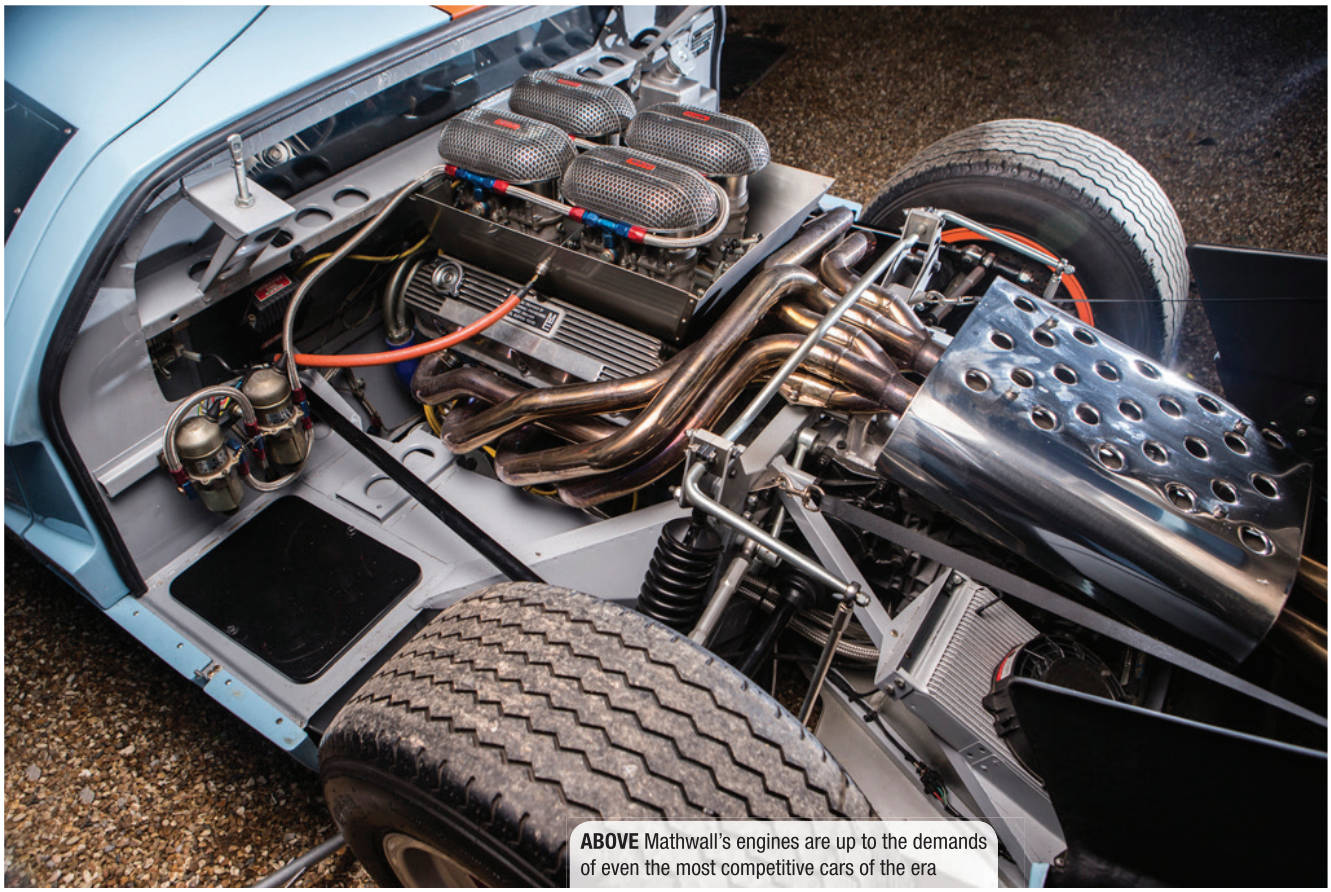
"It's a constant battle, as soon as you make an enhancement somewhere you have to think about everything else"

components and assess whether we are getting loft and separation from the cam."

One of the other ways the SpinTron might prove useful to Mathwall in future is to carry out a detailed study of the frictional losses within its historic engines. The machine would allow the company to measure how much of the engine's power is wasted system by system and to prioritise where the firm could find improvements. Part of the reason for focusing on friction rather than the valvetrain is that, aside from being confident that Mathwall already has good valve control, with the FIA imposing a rev limit of 7,000 rpm, the returns from focusing on the valves are unlikely to be significant, or as Mark puts it, "there is only so much you can do".

This careful consideration means that Mathwall is able to focus its resources on components where the biggest gains can be found. With the Ford V8s, one of these areas is the cylinder head. Using a flow bench to scrutinise a number of senior engine builder Mathew Smith's hand fettled ports, Mathwall has been able to work out what is the absolute optimum port shape and port size for getting as much air into the engine as possible. As FIA rules require the engines to use original pre-1966 heads, Mathwall has to work within the confines of the original castings which were designed for a modest 280 bhp output; the removal of too much metal would leave the cooling jacket walls too thin. Having reverse engineered the perfect design from these handmade ports, it is then possible to subcontract the machining of the parts to a CNC specialist. Going through this process means that not only is the preparation of the heads more efficient, but it also means that every customer gets, to exacting tolerances, the best porting possible.

Mark says that this reverse engineering has been made far, far easier thanks to ▶



ABOVE Mathwall's engines are up to the demands of even the most competitive cars of the era

measuring tools that engine tuners in the sixties could only have dreamed of. “I can remember when the CMM (coordinate-measuring machine) just used to touch-on, so if you wanted to measure a port you would effectively go around each section and the CMM would touch-on maybe 20 times before going deeper and repeating the process. Now the probe can stay in contact at all times, and it’s much faster.

TECH REVOLUTION

“I watched a guy the other day – in fact he did the inside of a sump for me: I’m trying to make baffles and gates and walls fit in there, so having a surface is key. Well, he just waved this FARO Arm scanner over it and up it came on the screen. That would have taken so long until recently. Setting it up on a CMM would have been very time consuming, and that would have only given me a point cloud anyway. I don’t have to try and fit surfaces through a point cloud any more, the machine does it.”

Mathwall has worked on almost all the engine components over the years, everything from the connecting rods to the gudgeon pins, but even after a component has been redesigned, it isn’t forgotten by Mathwall’s engineers, who revisit individual parts and improve them when there is an opportunity. The pistons for example, were redesigned when new piston ring technology meant that they could be modified to take advantage of these new, thinner rings and offer a piston that had less ring friction. It was also a chance to tweak the rest of the component; making it lighter to reduce the reciprocating weight, and using smaller, racing skirts. This again is another area where the cutting edge engineering services side of the business could be put to good use for historic engines, with its system-level expertise being able to accurately identify the benefits of any individual changes, which could then go on to inform the design direction for the next development of pistons.

Another of the tools at Mathwall’s disposal to improve the performance of individual components is the ability to predict performance using 1D simulation software. The camshafts for example are one place that Mathwall is currently focusing on in parallel with their new optimised ports. “We have a good bank of historical data now, so we can use five years [worth of data] to validate the model, and then we could step through the last five years and see if the model predicts accurately what we have found on the dyno from each of the cams we have used,” says Mark.

“So we could go through a lot of cams in the 1D simulation world and have a reasonable level of confidence that some ideas are worth trying in hardware.”

Furthermore having success in one area of engine development often opens up new avenues for the team to pursue. The hard-earned improvements that have been made to the port have enabled Mathwall to go back to the cam to increase lift, but “the next thing that might happen is that the cam to lifter interface may start to get into trouble,” says Mark. “Well, we’ve now got to solve this or we’ve got to go back to ▶





ABOVE & BELOW The difference between the original heads sourced in California, and the carefully fettled versions leaving Mathwall is stark



REMAINING 2018 SCHEDULE

★ JULY	26/29	Portland Vintage Racing Festival	Portland International Raceway, USA
AUGUST	10/12	Oldtimer Grand Prix	Nürburgring, Germany
★ AUGUST	18/19	Monterey Pre-Reunion	Mazda Raceway Laguna Seca, USA
★ AUGUST	23/26	Rolex Monterey Motorsports Reunion	Mazda Raceway Laguna Seca, USA
AUG/SEPT	31/02	Historic Grand Prix	Zandvoort, Holland
SEPTEMBER	14/16	Spa Six Hours	Spa, Belgium
★ OCTOBER	5/7	CSRG Charity Challenge	Sonoma Raceway, USA
OCTOBER	12/14	Dijon Motors Cup	Dijon, France
NOVEMBER	16/18	Sound of Engine	Suzuka, Japan

*Support race. Correct at time of going to press.
Dates and venues may be subject to change.

FIA MASTERS HISTORIC FORMULA ONE CHAMPIONSHIP
FIA MASTERS HISTORIC SPORTS CAR CHAMPIONSHIP



Masters Historic Racing
The Bunker, Lower End Road
Wavendon, Milton Keynes MK17 8DA

T +44 (0)1908 587545 **F** +44 (0)1908 587009
US Office: T +1 347 343 5898

Masters Historic Racing @MastersHistoric
www.mastershistoricracing.com
team@mastershistoricracing.com

the cam and soften it a little bit. So it's a constant battle, as soon as you make an enhancement somewhere you have to think about everything else."

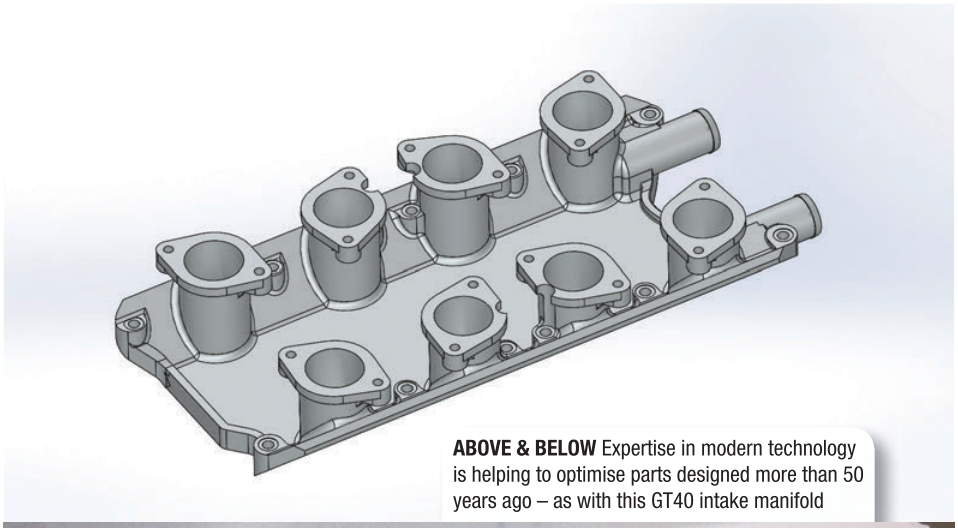
This constant process of improvement has meant that the level of expertise and refinement is now at a massively granular level. One of the current ideas is to slightly modify the shape of the combustion chamber after realising that the shape of the pistons that Mathwall was using could cause detonation to be focused on one particular area, which isn't ideal. So it has got to the level now where the company is teasing out improvements by managing the precise location of detonation using subtle changes to the shape of the piston crown. "It's getting quite detailed now," says Mark dryly.

Of course, all this scrutiny in the workshop and on the in-house dyno is one thing, but it is quite another to see how it performs on the race track. This is why there is often a member of Mathwall's team trackside, when its clients' cars are being raced. Not only does this reassure car owners that if there are any problems, they can likely be fixed pretty quickly without ruining a weekend's racing, it also means that the engineers are able to talk to the drivers and get lots of great qualitative feedback about the character of the engines and how they actually work in the heat of battle.

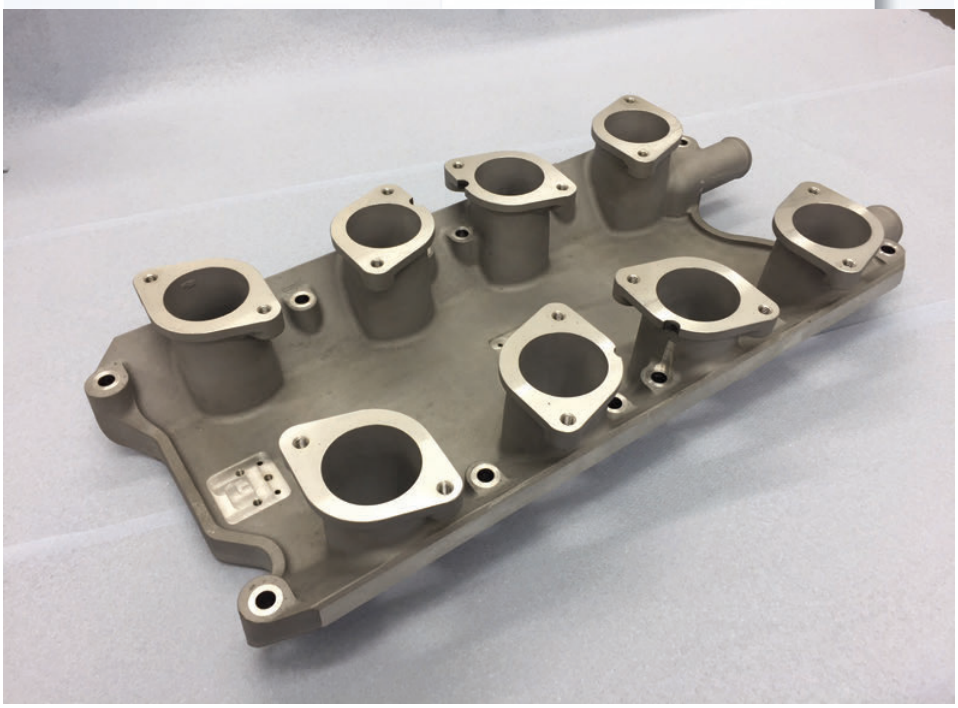
This is particularly important given the strict rules on data logging imposed by the FIA on historic racers. Without the ability to pore over huge datasets to understand what the car is doing, the engineers must decipher the customers' comments to find out what's really going on, which can sometimes lead to interesting discoveries.

It was one such occasion which sparked the idea for the study of the water pump, recalls Mark. "We had a comment from a client, who said that his Cobra was running quite cool, but his Daytona Cobra wasn't. So, you think, 'ok it's one engine spec to us, what is different?'"

> **"The engineering services side, that is what will set us apart"**



ABOVE & BELOW Expertise in modern technology is helping to optimise parts designed more than 50 years ago – as with this GT40 intake manifold



After thinking about this puzzle, Mark began to consider the differences in radiator entry, with the Daytona having a smaller radiator than a standard Cobra. "OK so that might mean we can get away with a different pump on the standard Cobra."

LEVEL OF SCRUTINY

Reassuringly all this attention to detail, the unbelievable level of scrutiny and refinement, as well as the innovation and insight offered by the engineers, pays off. Although the competition is fiercer than ever, Mathwall is more than holding its own, with one of its engines in a 1965 GT40 MK1 taking the overall honours in Plateau 4 at July's Le Mans Classic and another in a 1969 Lola T70 Mk III B achieving fourth place overall in Plateau 5. This is a trend that looks likely to continue with Mathwall having recently received planning permission to expand with new design space and workshop space, as well as an investment in two young staff members who are on day release to learn more skills to bring to the business.

"The historic racing will continue," states the company's general manager, Alex Marshall. "We just want to be a much bigger player in the field... but it is the other side of the business, the engineering services side, that is what will set us apart," he concludes. HRT

SATURDAY
22ND SEPTEMBER
BROOKLANDS
MUSEUM

THE AUTUMN SALE



1965 JAGUAR E-TYPE
SERIES I COUPÉ
Sold by Historics
7th July 2018
£145,600

FINE ENTRIES ARE NOW INVITED

FINE CLASSIC CAR & MOTORCYCLE AUCTIONEERS
Tel: 00 44 (0) 1753 639170 | E-mail: auctions@historics.co.uk | www.historics.co.uk

HISTORICS

CLASS OF '82

In an extract from a new book that charts every race that he drove for Porsche, sportscar racing legend **Derek Bell** recalls the first season of Group C

DEREK BELL'S Porsche career stretched from 1971 to 2000, and encompassed everything from the 917 and 935 to the 962 and 911. During the late 1970s, however, race outings were few and far between, and he came close to quitting. Then Porsche offered him a drive at Le Mans in 1981, and his victory with Jacky Ickx helped to gain him a full-time seat in the works team for the following season – which would be the first for the Group C regulations and Porsche's new 956...

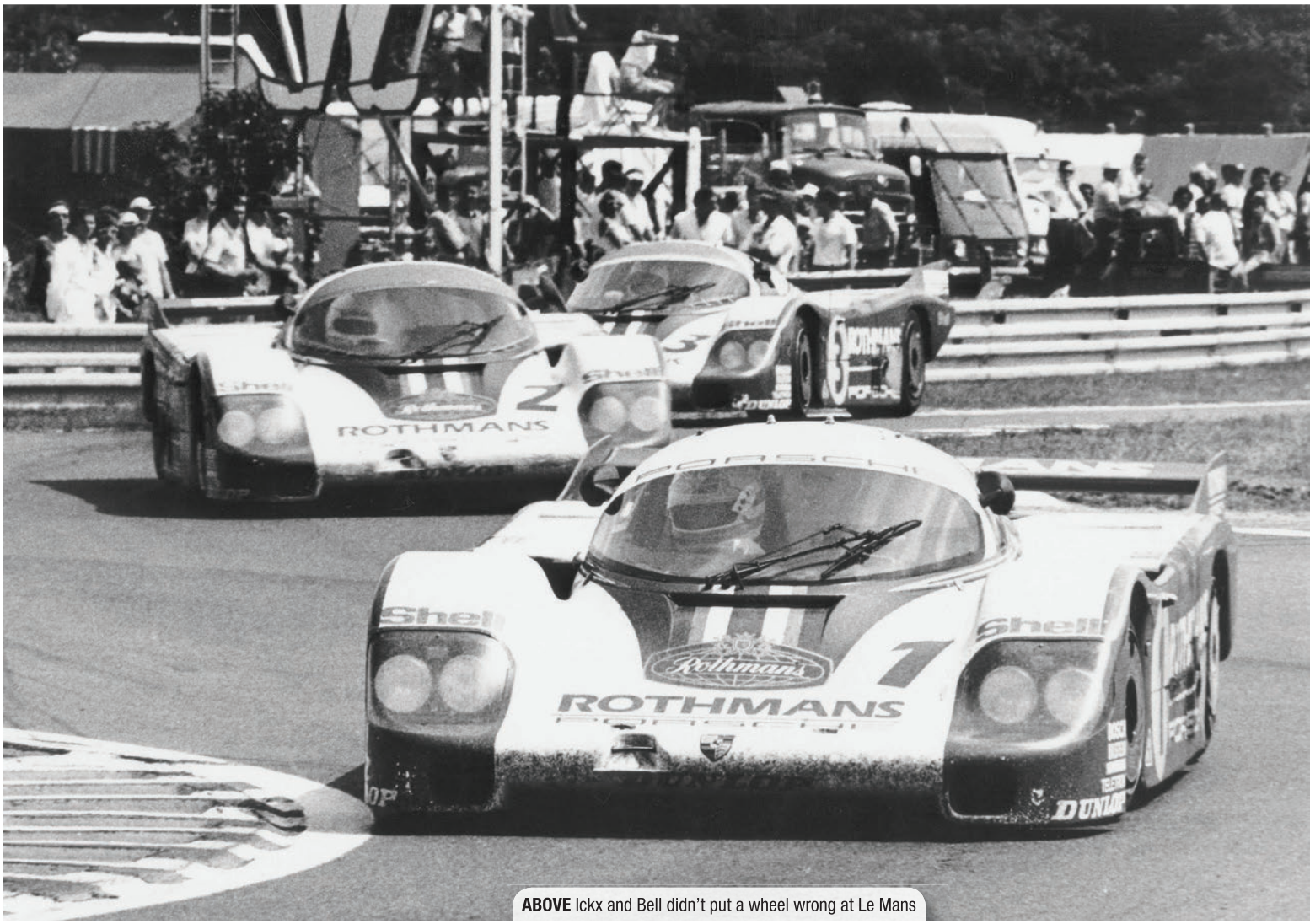
SILVERSTONE 6 HOURS
16 MAY

Bell's maiden outing in the 956 was not a happy one. The *Autosport* headline 'Hare beats Tortoise' said it all.

"I couldn't wait to do this race. I was sharing with Jacky Ickx, but I knew even before the start that we weren't going to win. The new Group C regulations meant that you could compete with only so much fuel. As such, you would often qualify several seconds faster than you would lap in a race. It was maddening. The whole point of motor racing was to drive quickly, not prat about worrying about fuel economy.

"What I hadn't appreciated until our team manager Peter Falk told me, was that the works Lancias were still running to the old Group 6 regulations. They were fully exploiting a loophole whereby, for one season only, they could use as much fuel as they liked before the Group 6 homologation expired.

"On race day morning, Peter admitted



ABOVE Ickx and Bell didn't put a wheel wrong at Le Mans



ABOVE Bell's name is now synonymous with Porsche's 956. Behind the scenes, his maiden campaign with the car was sometimes a turbulent one

that he had miscalculated the amount of fuel that we were likely to use. Jacky had qualified the car on pole, but he then droned around behind the two factory Lancias, some two or three seconds slower than he had qualified.

"I did a one-hour stint towards the end of the race and remember being beyond angry that I was lapping so slowly. There was so much left in reserve, but I just had to be disciplined.

"I suppose it paid off as the second placed Lancia LC1 of Teo Fabi and Piercarlo Ghinzani had an engine blow up, but to finish second behind its sister car, three laps down, in front of my home crowd was pretty embarrassing. I was pretty vocal afterwards, but Peter told me that rules are rules and it was up to me to adapt accordingly."

LE MANS 24 HOURS 19-20 JUNE

If the Silverstone outing had proved humbling, Bell's irritation was salved with victory in the 50th running of the Vingt-Quatre Heures du Mans.

"I would never say that winning any race is easy, let alone an endurance event, but Jacky and I didn't put a wheel wrong. After Silverstone, there had been a full 24-hour race simulation exercise on the rolling road at Weissach, followed by an extended test session at Paul Ricard. The net result was some aero tweaks front and rear and an improved fuel-injection system.

"To be honest, ours was a pretty metronomic outing. We were third after four hours, second after eight and in the lead by half-distance. Jacky and I got our heads down and maintained a disciplined pace to the end. The only scare, if you can call it that, was a puncture at three-quarter distance when Jacky was driving. Typically, his luck held, and it occurred barely half a kilometre from the pits so we lost little time.

"I'm not normally superstitious, but this was my 13th Le Mans outing, so I was praying that there wouldn't be any late dramas and there weren't. We led home our sister cars, with Jacky taking his sixth Le Mans win and me taking my third. What's more, it was our third together."

SPA-FRANCORCHAMPS 1000 KM 5 SEPTEMBER

Porsche descended on the Ardennes circuit with two Rothmans 956s, with the Le Mans pairing of Ickx and Bell being split. "I loved driving with Jacky, but he would now drive with Jochen Mass while I was paired with Vern Schuppan. I don't mean this to sound disrespectful, but Vern and I never clicked as team-mates. I don't know why. I liked the guy and he was a good driver, but we never won together. It's like that sometimes. With Jacky, I always felt like a potential winner going into a race. I didn't feel that way with Vern.

"As it happens, we trundled around, all the while mindful that we had to conserve fuel, and finished second behind the sister car."

Ironically, given his distaste for the Group C fuel regulations, Bell benefited from the last-lap retirement of the Alboreto/Ghinzani Lancia LC2. The Group 6 car's fuel pump was unable to scavenge the remaining few drops of fuel as he climbed the hill out of Eau Rouge for the final time and Alboreto coasted into retirement from second spot. Had the race been run another lap, Bell and Schuppan could conceivably have won because the Ickx/Mass car was running on empty as it crossed the finishing line.

FUJI 1000 KM 3 OCTOBER

The first ever Japanese round of the World Endurance Championship for Drivers witnessed a Lancia-Porsche battle: one that at three-quarter distance looked like going the way of the Italian marque.

"I was teamed up with Vern Schuppan again. We qualified fourth, and I had my usual concerns about fuel economy for a six-hour race, but Peter Falk had absolute faith in the new Bosch engine management system. He was confident that the 956s could now go toe-to-toe with the Lancia LC1s and not have to worry too much about conserving fuel.

"As it happens, it wasn't a great race for ▶

us. I had been running second to Jacky during the early running, but then our car suffered a broken oil pipe. That took a while to fix before Vern could do his stint. We were little past the halfway point when a blown tyre resulted in Vern spinning off into the barriers, damaging the car's suspension. We were out."



ABOVE A half-hearted smile for the cameras after finishing second at Silverstone. In private, Bell was seething

BRANDS HATCH 1000 KM 17 OCTOBER

The factory Porsche team's final outing of the 1982 season wasn't without its dramas as Lancia's Riccardo Patrese vied for the Drivers' Championship.

"Only one 956 was entered, and I was reunited with Jacky Ickx who was fighting for the title. I wasn't seriously in contention since our partnership had been split earlier in the year.

"This was a strange race, not least because of the weather. It rained during qualifying and we were surprised to see two Ford C100s blanket the front row, with the factory Lancias behind them. We were sixth, somewhat lower than expected.

"The race itself was pretty chaotic. We started on a sodden track and all hell broke loose. Guy Edwards' Lola spun off almost immediately, as did Siegfried Müller's Sauber. Then Michele Alboreto's Lancia smacked Hans Stuck's Sauber before the Fords connected going through the Pilgrim's Drop section. Manfred Winkelhock's C100 went into the barriers with sufficient force to knock them over. The race was then red-flagged. After a long delay, the race was restarted, again in the wet, but with the results being held on aggregate times. What's more, it was unlikely to go the full distance due to fading light.

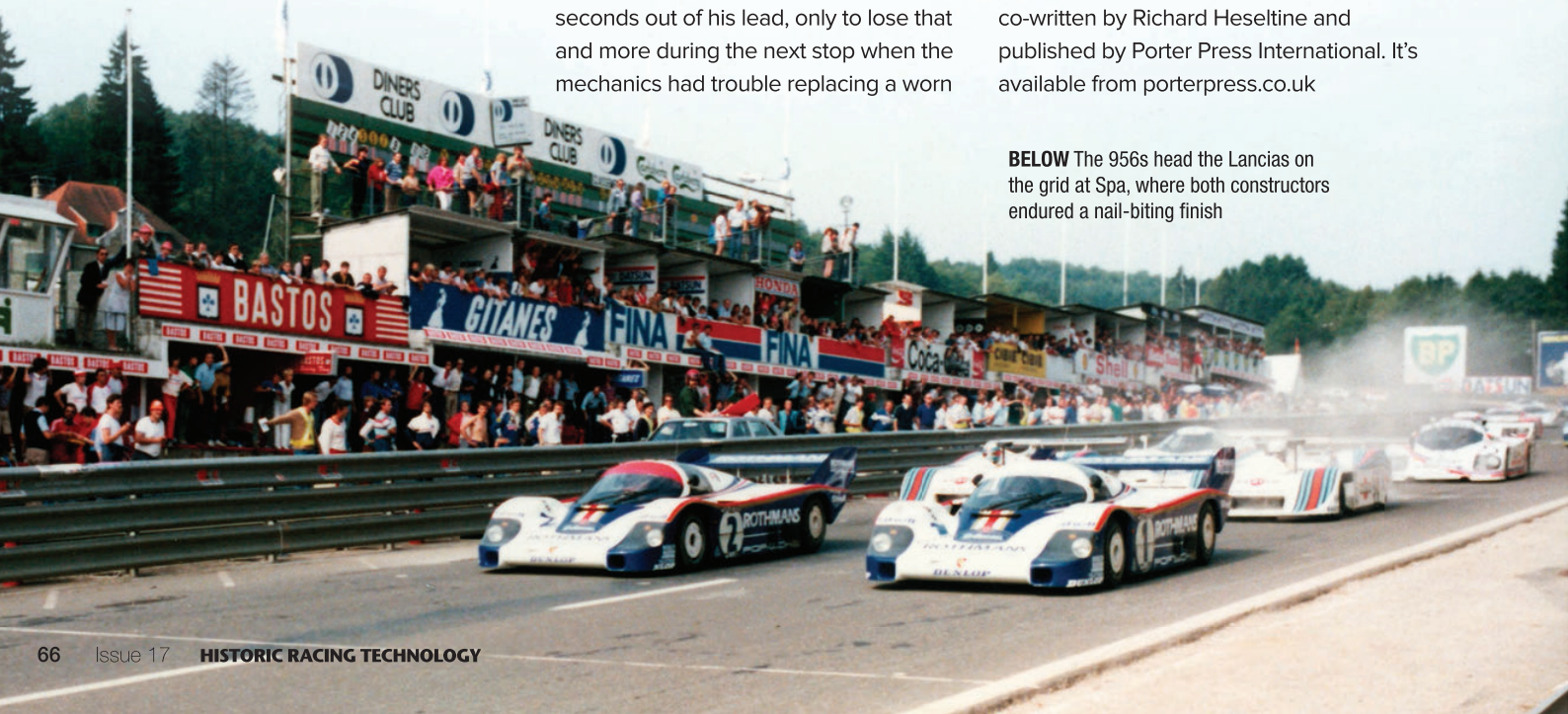
"Stucky led on the restart, but he was a sitting duck once the rain stopped and the track started to dry. Alboreto became a factor for a while, but his car stopped with electrical failure before his first pitstop. It then boiled down to a battle between us and the Patrese/Fabi Lancia. They had a lighter car with lower tyre-wear rate, and I was on wets on a drying track during my first stint and had to stay out there for 20 laps. I can remember desperately trying to seek out any damp patches; anything to cool the rubber.

"They were a lap ahead by the time I pitted, but Jacky flew on the intermediates and managed to claw back a lot of time. At the next stop, I rejoined on slicks, 15 seconds down on Patrese, who was doing a double shift. I managed to chop 10 seconds out of his lead, only to lose that and more during the next stop when the mechanics had trouble replacing a worn out brake pad. Jacky then put on a blinder and chased down the Lancia, which by now had Fabi behind the wheel."

The final seven laps witnessed an epic battle, the Belgian hunting down the Italian in dwindling light. As Fabi started his final lap, he had a 4.1-second cushion. It was now dark, and the Lancia LC1 had no lights. Coming onto the Brabham Straight for the last time, the Porsche streaked past to win by 1.7 seconds. Ickx was champion from Patrese, with Bell third.

"I was delighted for Jacky, not least because he had supposedly retired from driving two years earlier! I was disappointed that I hadn't been paired with him throughout the season, though, as we would have shared the title. More than anything, it stood us in good stead for the '83 season as we knew the Lancia Group 6 cars wouldn't be allowed to compete anymore." HRT

Derek Bell – All My Porsche Races is co-written by Richard Heseltine and published by Porter Press International. It's available from porterpress.co.uk



BELOW The 956s head the Lancias on the grid at Spa, where both constructors endured a nail-biting finish

REVOLUTION
COMPETITION WHEELS



Since 1967

SIZE	OFFSET RANGE	C DIMENSION (BACKSPACE)	APPROX WEIGHT KGS
13 X 8.0	-13 TO 17	97 TO 127	4.4 TO 5.0
13 X 10.0	-38 TO -08	97 TO 127	5.3 TO 5.9

SIZE	OFFSET RANGE	C DIMENSION (BACKSPACE)	APPROX WEIGHT KGS
13 X 5.5	-17 TO 13	60 TO 90	4.0 TO 4.6
13 X 6.0	-13 TO 17	73 TO 103	4.1 TO 4.7
13 X 6.5	-06 TO 24	85 TO 115	4.2 TO 4.8
13 X 7.0	00 TO 30	98 TO 128	4.3 TO 4.9

ALL WHEELS CAN BE MACHINED TO ACCEPT SLEEVE OR CONICAL NUTS AS WELL AS 4 PIN CENTRE LOCK.
SPECIALIST BRABHAM & CHEVRON FITMENTS AVAILABLE.

For more information contact:
TEL +44 (0) 1623 860000 • FAX +44 (0) 1623 860165 • MOB +44 (0) 7702 845264
www.revolutionwheels.com • info@rwil.org.uk

MADE IN UK

PowerLite

The Powerlite range of performance electrics offers a solution for all your problems affecting starting or charging your vehicle. The historic racing specialists.

EARTH AVAILABLE



The Original
DYNALITE
Alternator Conversion



Lightweight performance
ALTERNATORS

HIGH TORQUE
Starter Motors

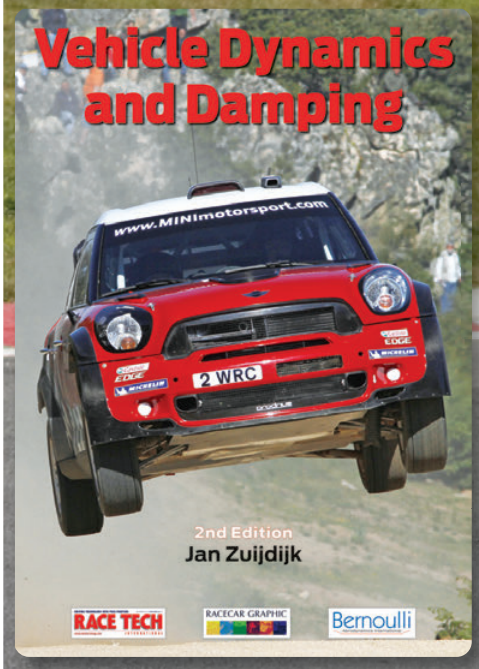


SLIMLINE
Lightweight Gear Reduction Units



FULL RE-MANUFACTURING SERVICE AVAILABLE

www.powerlite-units.com
T: 01384 261984 E: sales@powerlite-units.com



VEHICLE DYNAMICS AND DAMPING

BY *JAN ZUIJDIJK*

NEW AND IMPROVED 2nd EDITION

The follow-up to Jan Zuijdijk's original book that has been edited by William Kimberley, editor of RACE TECH magazine.

The author, who has been involved with suspension design and development for race and high-performance road cars for more than 40 years, writes about the evolution of suspension systems over the decades. However, this is more than just an historical book but a very practical one that will help the driver and vehicle dynamics engineer set the car up in the best possible way.

~~£25.00~~ **£10** **SALE NOW ON**

To order visit our website at:
www.kimberleymediagroup.com

For further information please contact Kimberley Media Group Ltd e-mail: info@kimberleymediagroup.com
841 High Road, London, N12 8PT, UK, Tel +44 (0) 208 446 2100 Fax +44 (0) 208 446 2191
E-mail: soheila.kimberley@kimberleymediagroup.com Website: www.kimberleymediagroup.com

KIMBERLEY MEDIA GROUP LTD

Friction-free performance

THERE is a lot of rumour and anecdotal evidence surrounding the benefits an oil can bring to an engine, but this is hardly conclusive. To do things in a more scientific way, Millers Oils has put a Ferrari 250 GT V12 on the dyno, and swapped the engine's lubricant to its latest high performance CFS 10x60 NT+ engine oil. The lubricant, which utilises the company's NANODRIVE technology, achieved peak power and torque increases of seven percent. This was enabled by its low friction formulation, which means power and efficiency can be combined with outstanding engine protection and durability.

"The power gains achieved with our NANODRIVE oil are a result of unlocking efficiency that is normally lost to friction," explains Millers technical director, Martyn Mann. "Reduced friction also helps to slowdown component wear, meaning race teams or privateers can go longer between scheduled rebuilds. Of course, power gains from a simple oil change can provide a crucial competitive advantage in race series with strict engine modification regulations; a seven percent increase in peak power and more useable torque throughout the rev range could make the difference between first and failure."

The study conducted by Millers saw an overall increase in power of 20 hp, up from 281 hp to 301 hp, and a 15 ft lb increase in torque from 203 ft lbs, to 218 ft lbs, while also demonstrating gains across the powerband, right up to the engine's 7400 rpm rev limit. The results came from the average of three consecutive independent tests using an engine dyno at Edi Wyss Engineering in Switzerland.

"A traditional method of reducing friction is by using a thinner oil – reducing viscosity – but this can compromise durability and accelerate wear rates, especially in demanding racing conditions," adds Mann. "NANODRIVE technology enables friction and wear reduction without altering the original manufacturer or engine builder's oil specification." HRT



ABOVE In dyno testing, Millers found its new NANODRIVE oils improved the power output of a Ferrari 250 GT V12 by seven percent





FORMULA 1 2015/2016 Technical Analysis

Giorgio Piola

Size: 24,3x27 - Pages: 128 - Photos: over 400 technical drawings in colour
- Softbound with jacket - Text: English
ISBN: 978-88-7911-656-5 - Price: £32.00 + plus post and packaging

As with previous years, 2015 was one in which Mercedes-Benz dominated both the drivers' and constructors' championships. The German manufacturer confirmed the technical advantage it had derived from the introduction of the revolutionary power unit, which first appeared in 2014. In place of Red Bull, which fell into disgrace after a media conflict with engine supplier Renault, it was Ferrari that attempted to stand up to the Silver Arrows. Side issues were the stories of a Williams wanting to come back and battle for the title; McLaren with a new but not very effective Honda engine, which touched the lowest point in the Japanese manufacturer's long history in F1; and the other leading teams of a season that ended with the official announcement of Renault's return, having acquired Lotus.

Offering a precise analysis of this latest F1 championship, especially from the technical point of view, there is once again Giorgio Piola. A hundred or so all-colour illustrations document the development of the various cars throughout the Formula 1 World Championship, and offer - as always - a wealth of information anticipating the 2016 season.

To order visit our website at:
www.kimberleymediagroup.com

For further information please contact Kimberley Media Group Ltd e-mail: info@kimberleymediagroup.com
841 High Road, London, N12 8PT, UK, Tel +44 (0) 208 446 2100 Fax +44 (0) 208 446 2191
E-mail: soheila.kimberley@kimberleymediagroup.com Website: www.kimberleymediagroup.com

KIMBERLEY MEDIA GROUP LTD

PowerLite

At last! High performance, quality lithium ion LiFePO4 batteries for motorsport at an affordable price.



Saving you £'s while saving you KG's.

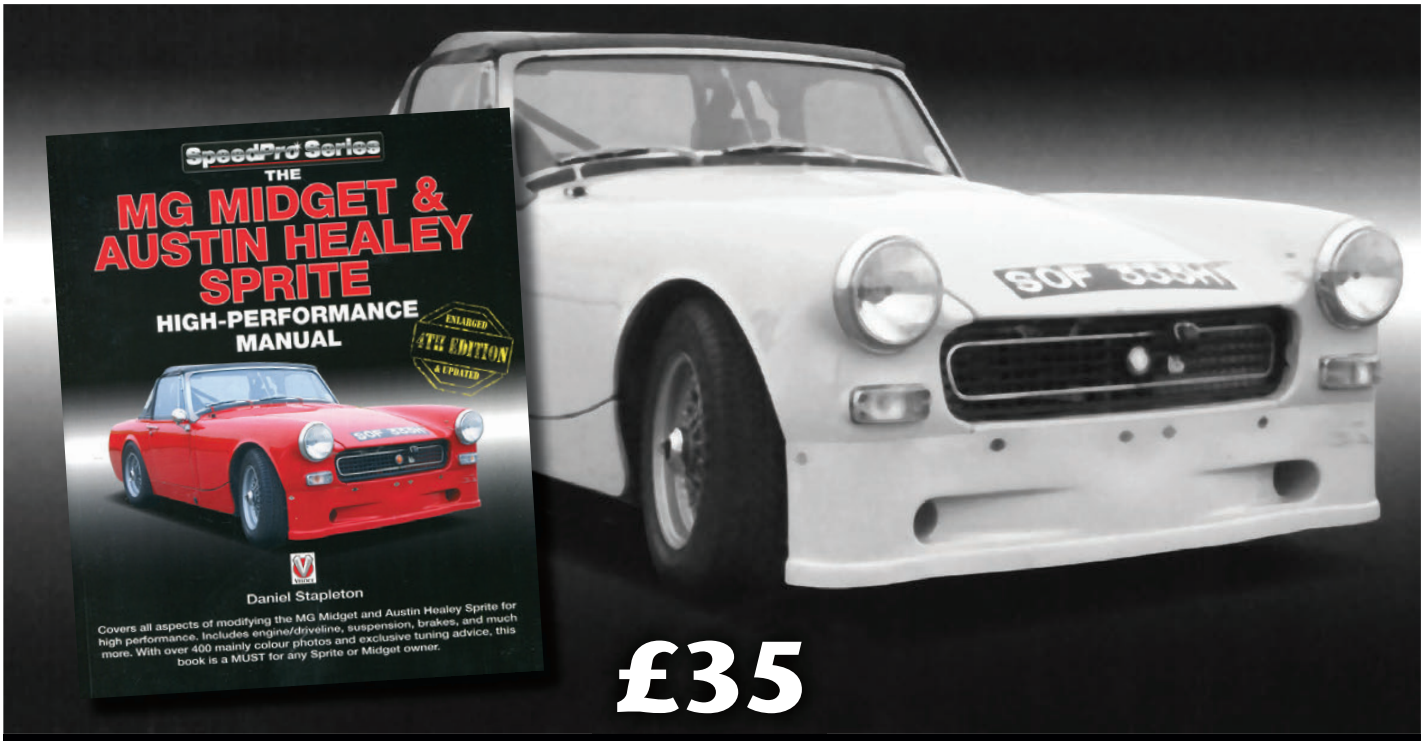
MODEL	VOLTAGE	CAPACITY (Ah)	COLD CRANKING	WEIGHT (KG)	SIZE (MM) (W x D x H)	PRICE (Inc. vat & P&P)
PS-05	12.8	5	160	1.1	112 x 70 x 104	£64.99
PS-09	12.8	9	300	1.4	150 x 87 x 104	£94.99
PS-20	12.8	20	630	2.4	173 x 87 x 154	£199.99
PS-30	12.8	30	800	3.3	164 x 124 x 175	£239.99



Unique built in Voltage check panel.

Bespoke brackets and chargers available from stock.

www.powerlite-units.com
T: 01384 261984 E: sales@powerlite-units.com



To order visit our website at:
www.kimberleymediagroup.com

For further information please contact Kimberley Media Group Ltd e-mail: info@kimberleymediagroup.com
841 High Road, London, N12 8PT, UK, Tel +44 (0) 208 446 2100 Fax +44 (0) 208 446 2191
E-mail: soheila.kimberley@kimberleymediagroup.com Website: www.kimberleymediagroup.com

KIMBERLEY MEDIA GROUP LTD



ELECTRICS YOU CAN DEPEND ON

ABOVE Powerlite are experts in making rotating electrics that combine the looks of the past, with the reliability of today

WITH historic racing cars needing to run to the schedule of a racing series or car club, and not just at times that the car's original electrics allow, many people choose to use a company like Powerlite to replace or renew parts like alternators and starter motors.

Powerlite is based in the West Midlands and has been manufacturing and supplying rotating electrics for road, motorsport and historic motorsport for more than 40 years, and specialises in alternators, dynalites (Powerlite were the first company to produce alternator technology in a dynamo case) and high torque starter motors.

As well as manufacturing new items for historics, Powerlite also has a full classic remanufacturing department which works to restore all makes of alternator, dynamo and starter motor from any era, to 'back to new' condition. To assist in these classic rebuilds Powerlite can call on its parent company's 'old core' holding of over 100,000 units.

As well as offering increased performance over the original units fitted, there are many items that can also offer a considerable weight saving; one of the reasons that Powerlite's range has enjoyed so much success on the race track. Two of the most popular of these weight saving products are the Slimline starter motor range and the 068 universal alternators. These two products are popular across the globe and are regularly called into action on countless FIA Lotus Cortinas, Mini Cooper 'S', Lotus Elans, and single seaters among others.

The old adage, 'to finish first, first you must finish', is particularly true in historic racing where 60 year old components can be a problem. However, thanks to the replacement and remanufacturing service offered by Powerlite, at least it shouldn't be the rotating electrics that ruin the race. HRT



Deliver On Track with D.O.T

It's on the track where it matters. Everything else is merely a distraction. When it comes to logistics, this distraction can become expensive and time-consuming.

Delivered On Time have over 80 years of collective experience in global motorsport logistics including Formula One, WRC, Superleague Formula, Macau GP and A1 GP World Cup of Motorsport as well as global events like the Olympic Summer and Winter Games and the FIFA Football World Cup.

D.O.T are therefore ideally placed to support your efforts in the ALMS, as well as the WEC and the 24hrs of Le Mans.

Our services include:

- Express service within the USA and Europe for all motorsport events
- Dedicated project team for total event logistics
- Air and sea charters to meet your event requirements
- In house ATA Carnet service – easing movement of your operations
- Network of approved international agents
- Round the clock operations, 365 days a year
- Ability to move cargo via air, land and sea
- Customs clearance anywhere around the world

Contact us today to find out how D.O.T. can help you make the most of your logistics so you can focus on what really matters.

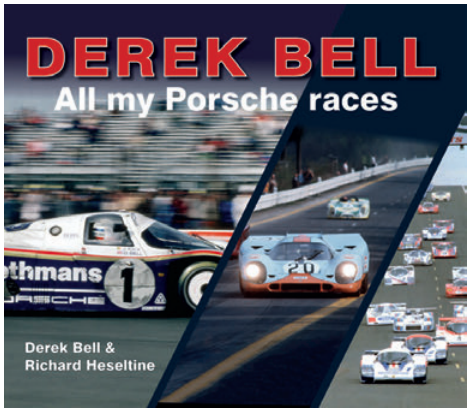
T: +44 (0)20 8890 5511
W: www.deliveredontime.com
E: sales@deliveredontime.com

D.O.T delivered on time
location . logistics . specialists

Image: Jakob Ebrey Photography

Derek Bell

All my Porsche races
Derek Bell & Richard Heseltine
Published by Porter Press International
ISBN 978-1-907085-65-9
276 pages
£45.00/$65.00



DEREK Bell to many sums up the perfect professional racing driver. Charming and debonair, he was also mighty quick when behind the wheel of a racing car, his competitive streak really coming to the fore.

He has had a long and very successful career in a variety of cars, but it is perhaps his association with Porsche, spanning some 39 years from his first race in one to his final appearance in one, that is most memorable for many, especially as he was driving the cars that defined endurance racing at the time. His is a career that starts with the fabulous 917, then with the 934, which he heartily disliked after a break of five years away from Porsche and then the Rothmans 956s, and then his time in the US spent campaigning the 962. As he writes in the book, "the USA was always very kind to me. I always enjoyed racing in North America long before I became a feature Stateside".

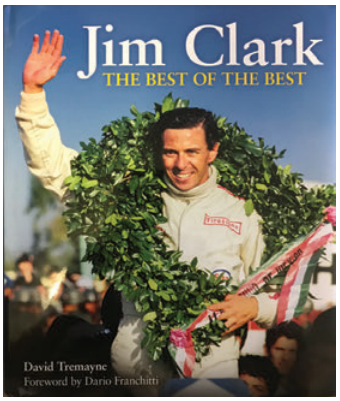
By the early 1990s, his racing career was definitely in the twilight years, but one event that did stand out was the 1992 Le Mans race. The works Porsche team had long packed up and left, but Bell was still active and got a drive in the ADA Engineering 962 GTI. What was so memorable for him was that one of his team-mates was none other than his son Justin. As he writes, he was both thrilled and terrified. The car was blighted with brake problems, wasn't very fast, but it did complete the 24 hours, Justin crossing the finishing line bringing a lump to his dad's throat.

His final race for Porsche was at Daytona in February 2000, bringing the curtain down on his time racing them. Unfortunately it was not a rousing finale, the EMKA Racing 996 GT3-R involved in an accident just 75 laps into the 24 hour race. As he states, at least he had the pleasure of watching his son finish second overall in a works Corvette.

This is a good, well written and illustrated book and if you are a fan of Derek Bell and/or racing Porsches, then it has to be one for you. HRT

Jim Clark

The Best of the Best
David Tremayne
Foreword by Dario Franchitti
Published by Evro Publishing
ISBN 978-1-910505-16-8
520 pages, 425 photos
£80.00/$120.00



THERE is no question that this is an expensive book, but when you have a pedigree writer putting his wordsmith skills into such a subject as Jim Clark, then it is worth every penny. In fact, it it's pretty good value for 175,000 words and 425 photos.

It would be easy to dismiss this colossus of a book as yet another biography on one world's most esteemed drivers, but that would be a mistake. Tremayne is a very highly respected motorsport journalist who leaves no stone unturned in his quest to provide an accurate story. There are still some people around who worked with this most famous of racing drivers, and they all have a story to tell.

The book is laced with some magnificent photos, but the ones that stand out for me are not the racing ones, but the more intimate ones. For example, there's a dramatic full page picture of Clark holding one hand to his face with a look of real anguish across it. Of course there is a caption to explain it, but just looking at the picture draws you right into the man, wanting to know what made him tick.

There's another full page picture of him wearing a helmet but what catches the eye is Colin Chapman poring over a pad on his knees with a look of deep concentration. You would love to know what both would have thought of today's world and the massive amount of data capturing that goes on.

Dario Franchitti has written an emotional foreword even though he had never met Jim Clark, who had died five years before he was born. He recounts just what an impact the double World Champion had on his life and how he openly admits how he hero worships him for the manner in which he held himself: quiet and unassuming out of the car, but an absolute tiger in the car.

The Best of the Best subtitle is explained by a very moving anecdote by Tremayne in his Introduction. I am not going to spoil it and give you a précised version in the hope that it will drive you to buy this book. HRT

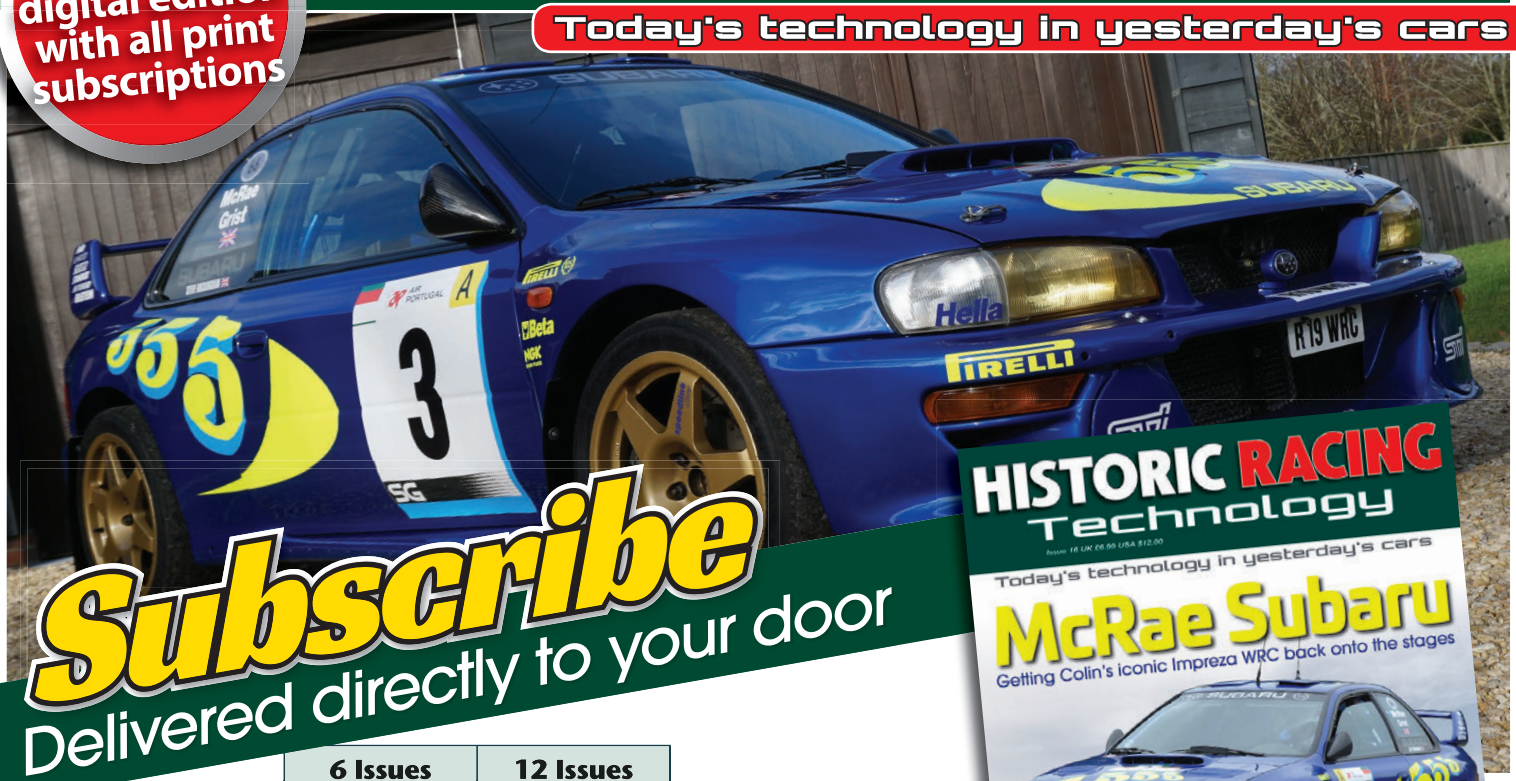
from the publishers of **RACE TECH**

HISTORIC RACING Technology

FREE access to digital edition with all print subscriptions

UK £6.99 USA $12.00 www.kimberleymediagroup.com

Today's technology in yesterday's cars



Subscribe

Delivered directly to your door



	6 Issues	12 Issues
UK	£42	£77
Europe	£66	£119
USA & ROW	£81	£146

Including post and packaging

HISTORIC RACING TECHNOLOGY brings a unique perspective to the business of restoring, preparing and maintaining historic competition cars in the 21st century, with in-depth technical articles on the engineering and craftsmanship behind this fast growing industry.

Where **Historic Racing Technology** differs from existing titles is a clear focus on the challenges and opportunities of running these cars in the modern era. From laser scanning through to five-axis CNC machining, historic racing specialists are increasingly blending modern methods and traditional techniques. As a result, it's now possible to produce authentic parts with an unprecedented level of accuracy. In some cases this goes a step further, re-engineering aspects of the car to deliver improved safety or reliability... and sometimes performance.

Featuring technical articles from some of the industry's most experienced journalists and engineers, **Historic Racing Technology** is dedicated to the classic motorsport scene across the globe. It takes a fresh new approach, looking at the future of historic motorsport as well as the past.

Available in Print

Available on the App Store

ANDROID APP ON Google play

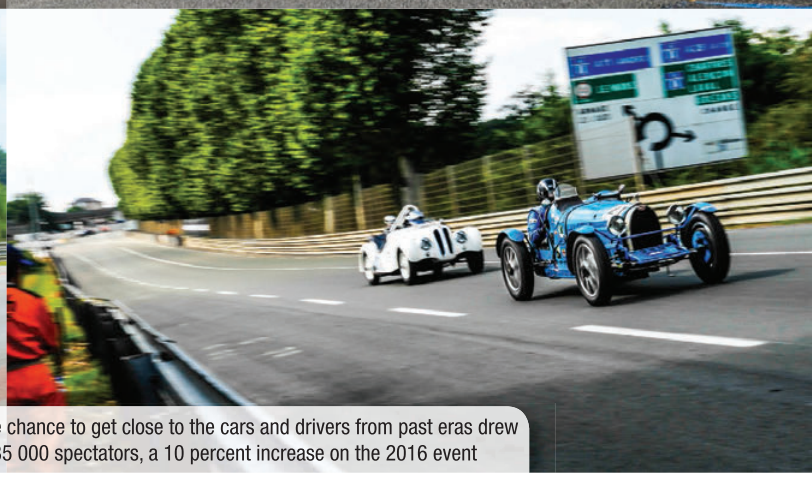
available on kindle fire

www.kimberleymediagroup.com









Photos: Peter Auto

ABOVE The chance to get close to the cars and drivers from past eras drew a record 135 000 spectators, a 10 percent increase on the 2016 event

ENDURANCE RACING'S COMING HOME!

Alan Stoddart reflects on a record-breaking edition of the Le Mans Classic

THE World Cup quarter-final faceoff between England and Sweden was shown on the giant screens in the village at the Le Mans Classic. At the final whistle, rousing renditions of 'Three Lions' erupted.

England fans caught up in the excitement of a 2-0 victory, their first win at that stage of a World Cup for 28 years, responded by belting out a song reminiscing about some of their team's all-time most iconic moments: Bobby Moore's famous tackle on Brazilian Jairzinho in 1970; Gary Lineker finding the back of the net against West Germany to equalise the semi-finals of 1990's tournament; and Nobby Stiles dancing with the trophy after England famously won the World Cup in 1966.

A song reminiscing about some of the greatest moments from England's Football past, seemed particularly suitable given the backdrop of the engine noises of the greatest cars from the history of the Le Mans 24 Hours. All the usual suspects were there, offering an excellent facsimile of previous editions. Roaring GT40s screaming past throaty Cobras, Bugatti Type 35s duking it out with Blower Bentleys and even races worthy of Steve McQueen himself with Ferrari 512s going head to head with Porsche 917s, and all this against a backdrop of one of the most iconic racetracks in the world.

As interesting as the on track action between the heroes though, were some of the rather more obscure cars. Entrants that over the years haven't enjoyed the same lasting renown as the successful runners, despite being full of character and representing some incredibly interesting avenues of Le Mans history.

Take for example the 1976 Inaltera GT, which was named after a wallpaper company, powered by a Cosworth DFV engine, and literally completed in the backyard of racing driver Jean Rondeau, who was behind the effort. Or the Tojeiro Climax from 1958, which was originally built by John Tojeiro to be raced by himself at the French event. However, customers kept buying them off him and unfortunately, he never did manage to make it to Le Mans in one of his own cars, so today he is best known for another creation – the AC Ace.

Even away from the track the Le Mans Classic delights with its unusual arrivals. The event's Concours Le Mans Heritage Club chose a carefully selected group of 24 cars to show off at the event, among them the truly weird WM P88. By 1988, the P88's creators, Gerard Welter and Michel Meunier, had been racing at Le Mans for some years, but realising their tiny outfit would never overthrow the big teams, they instead decided to simply focus on breaking the circuit's top speed record and set their sights on 400 kph. So the sleek racer with covered rear wheels set out from 36th on the grid, and spent many hours in the pits being repaired as bodywork started to work loose and engine problems arose.

Between these pit stops, and its ultimate retirement after a paltry 53 laps however, this hopelessly unreliable oddity managed to hit 407 kph (253 mph) on the then-uninterrupted Mulsanne Straight, a record that still stands today.

Maybe it's not singing about the greatest moments from the sport's exciting and eccentric past, but all things considered, an event like the Le Mans Classic, which gives you the chance to get up close and personal with legends and misfits alike, seems a far better way to reminisce. HRT

SUPREME Classic Fuel Solutions

PREMIUM Classic Fuel Solutions

Ethanol Free | Premium Lead Replacement | Supreme High Octane



Racing with the right fuel is key to success. Strengthened by having the right fuel partner, technical support and trackside service is exactly what Classic Fuel Solutions provides.

Track and dyno tested, married with outstanding results demonstrates our commitment to providing you with the best fuels…100.1...102…107 Octane.

With endless benefits comprising of 3-5 year shelf life, ethanol free, delivered trackside or ordered on-line. It's true to say we can provide you the complete fuel solution.

Contact us today to find out more.

www.classicfuelsolutions.co.uk Email: info@classicfuelsolutions.co.uk
Tel: {0044} 0800 037 1254

HISTORIC COMMITMENT



Dunlop has been the choice of winners for over a century. Whether it is endurance or touring car racing, we relentlessly explore new technologies to help our teams and drivers win.

But we also retain a deep commitment to promoting the history of racing, supplying period specification tyres alongside our latest specifications.

We are proud that Dunlop Appendix K competition tyres are chosen by leading historic racing championships for authenticity, quality and durability.

@DunlopMSport

facebook.com/dunlop.uk

www.dunlop.eu

DUNLOP
FOREVER FORWARD

Dunlop is represented at the Historic Motorsport Show by: HP Tyres +44 (0) 1327 301887 www.hptyres.com