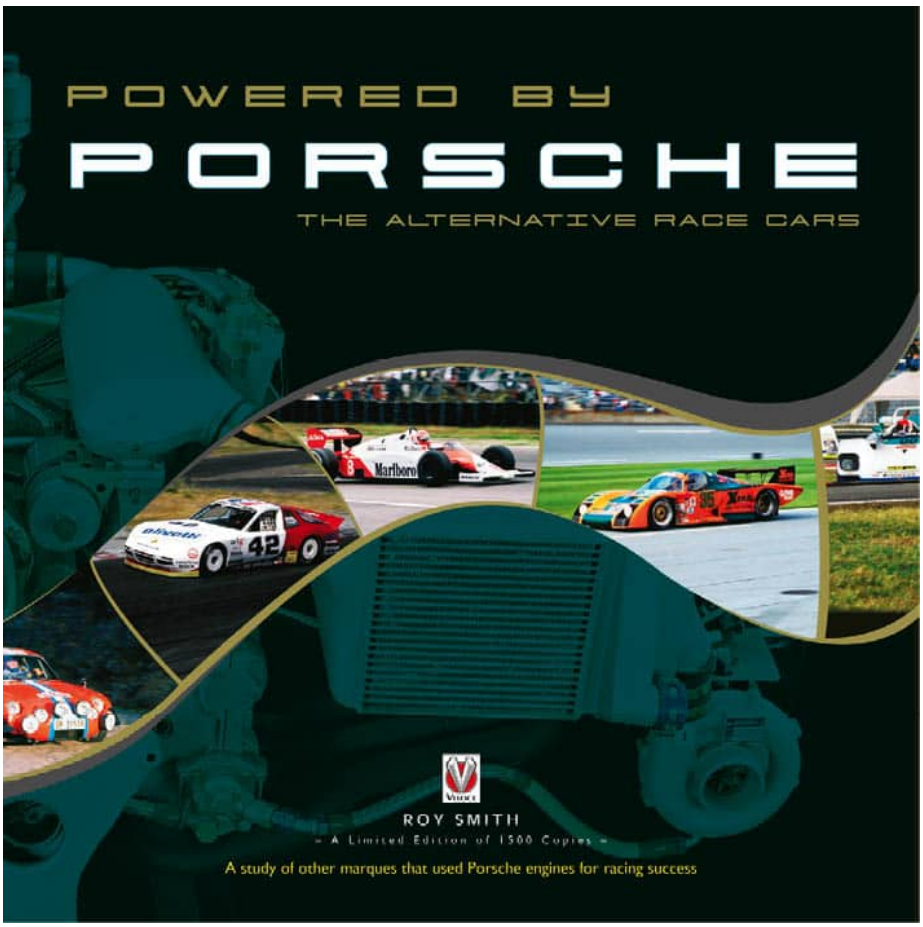
POWERED BY PORSCHE

THE ALTERNATIVE RACE CARS

ROY SMITH

– A Limited Edition of 1500 Copies –

A study of other marques that used Porsche engines for racing success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Acknowledgements and notes

A study like this does not get written by guesswork. It involves the help of many people, a lot of travel, interviews, visiting and researching in various archives. This means there are a lot of people to thank, and that is where we will start.

First, a huge thank you to Porsche Headquarters in Stuttgart: Jens Torner and his colleagues in the Stuttgart Public Relations Historical Archive Department headed by Dieter Landenberger. My grateful thanks, too, for the permission of the company Dr Ing hc F Porsche to use the images supplied by the Historical Archives for this work. A personal thank you to Norbert Singer, Jürgen Barth, Valentin Schaeffer, Hans Mezger and Herbert Linge for their contributions to this study. They are as much a part of the Porsche history now as they were in the heyday of our subject.

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To all of those who helped me, and any whom I may have – horror of horrors – inadvertently missed out, thank you!

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Paul Ross (PR)
Christian Huet (CH)
Tecno Register (TReg)
Joest Racing (JR)
Tom Winters (TW)

A few extra special re-mentions to highlight: Porsche fan extraordinaire and great enthusiast John Sanson, whose Porsche auto-memorobilia collection is huge; Trevor Crisp of Katana, expert in the 962 chassis, for checking and investigating many of the 962-based chassis and cars in the work; Max Ronconi and Paola Gottifredi for the details of the GKW; along with the aforementioned two stand-out photographers in the USA, Martin Spetz and Mark Windecker.

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Many teams and companies mentioned within the work have

websites, and so can be looked up on the internet. In addition, several other websites now also offer good access for race details and general information on Porsche-powered cars, though care should be taken on accuracy; some examples are:

www.ultimateracinghistory.com
www.racingsportscars.com
www.virtualmotorpix.com
www.pelicanparts.com
www.porscheroadandrace.com

Bibliography selection:
Jägermeister Racing, by Eckhard Schimpf
Herbert Linge: Pionier in Pole-Position, by Frank Wiesner
Porsche: Excellence was Expected, by Karl Ludvigsen
Professor Porsche's Wars, by Karl Ludvigsen
The Porsche Book, by Jürgen Barth and Gustav Büsing
Targa Florio – 20th Century Epic, by Pino Fondi
24 Hours Le Mans (official yearbook), by Jean-Marc Teissèdre/Christian Moity/Alain Bienvenu
Time and Two Seats, by János Wimpffen
Kussmaul Chronicles, by Craig Watkins
Oreca, by Hughes de Chaunac
Daytona 24 Hours, by J J O'Malley
Road to Monaco, by Howden Ganley
My Life at the Wheel, by John Fitzpatrick
Max Moritz Racing, by Jürgen Lewandowski
Porsche 956 and 962, by Glen Smale
Porsche 936, by Jürgen Barth/Bernd Dobronz
Porsche 934/935, by Jürgen Barth/Bernd Dobronz
Porsche Indy, by Jürgen Pippig
Porsche Alméras, by Jean-Marc Chaillet
Porsche Kremer 1962-2012, by Kahnt/Thier/Weber
McLaren, by Doug Nye
Porsche R to GTR, by John Starkey
Racing with a Difference – the History of IMSA, by John Starkey

956-962 Porsche, by Ulrich Upietz
The Story of March, by Mike Lawrence
Porsche Turbo USA, by John Starkey
Formula III Racing in North America, by Harry Reynolds
Porsche and Me, by Hans Mezger
The Racing Baron, by Huschke von Hanstein
Edgar Barth – 30 Jahre Rennen, by MVG gmbh
Directory of World Sports Cars, by Michael Cotton
Porsche – The Man and his Cars, by Richard von Frankenberg
Championnat d'Europe des Sport Protos 2 Litres, by Christian Naviaux
Ferdinand Porsche and the Volkswagen, Porsche Museum
Ferry Porsche, Porsche Museum
IMSA Yearbooks, IMSA
Intersérie: 'Les Big Bangers,' by Christian Naviaux
A-Z of Formula Racing Cars, by David Hodges
Can-Am Photo History, by Pete Lyons
24:16: Le Mans 24 Hours, 16 Wins with Porsche, by Norbert Singer/Michael Cotton
Porsche Racing Cars, by Brian Long
Abarth – The Man, the Machines, by Luciano Greggio
Anatomy of the Sports Racing Car, by Ian Bamsey
Porsche Raritäten, by Tobias Aichele
Golden Era – The History of Group C and IMSA GTP 1987-1993, by Ian Briggs/John Starkey
History of the Grand Prix Car, by Doug Nye
Porsche Argentina, by Cristian Bertschi/Estanislao Iacona

Magazines (period and current):

Christophorus Magazine, Porsche Panorama, Excellence, 911 and Porsche World, GT Porsche, Classic Porsche, Motorsport, Autosport, Motoring News, Mundo Deportivo, Automobile Sport, Vintage Race Car.

Notes:

The cars

Several cars are in private ownership, for which strict confidentiality and privacy have been observed. We have used chassis numbers only where we can be reasonably sure of accuracy; speculation is not entered into. Only selected cars in each marque are identified, the point being to examine the most important or most notable to demonstrate the capabilities of each marque.

Chassis numbers

Note that chassis numbers quoted may not always be what they seem. It was common practice throughout the sport that carnets and documentation (like vehicle passports today) were required to get cars from country to country. Through the period 1950 to 1990, races came in very quick succession – nearly every weekend. Each car would have its own paperwork. In motor racing, cars get damaged and the pressure to attend races (especially for start money) was great. So it was frequent that identical spare cars and replacements were waiting in the garage in case of dire need. Carnets and other documents took time to prepare and cost money – the public was waiting; the organisers were waiting. It was simply easier to move a chassis identification from one car to another than to have to prepare new documentation. The reader should therefore treat chassis numbers like quoted horsepower, as a guide not definitive, for the reasons stated above.

Horsepower

Throughout this work we will be using the terms hp and bhp as general terms unless otherwise stated; this is because listing and figures were observed to vary in documents in several cases. It is advisable to read the figures quoted as a guide only.

Archive documents

During research for this work the author was given access to the full archives at Dr Ing hc F Porsche in Stuttgart. Most of those documents are in German, of course, and therefore not practical to reproduce within an English-language work. However, with diligent

study and careful translation, considerable unpublished information is referred to.

Important notice

Even in a work where every attempt has been made to obtain permissions and verify comments, statements, data and information, there may still be omissions, miscredits and/or some differences of opinion. I hope the errors are few; everything contained within this work is published in good faith and strictly in the spirit of bringing the history to the reader and to preserve the story of these alternative race cars in the period for future generations, above all other considerations. I apologise here for any unintentional errors or omissions in technical or photographic acknowledgements.

Author’s introduction

The Porsche Company in Zuffenhausen, Germany, can be said to be probably the most successful marque ever for victories on the motor racing scene. Likewise, many firsts in innovation have come with the name Porsche attached. As the reader will see, for a start, electric cars and hybrids are not new. Porsche was there at the beginning in the late 19th century. Torsion bar suspension arrived in 1931 as a patent by Porsche. Then of course there is the turbocharger, not the first this time, but certainly at the forefront of development of this performance-enhancing device in motor racing. The list could go on.

This work covers the story of the racing cars powered by Porsche engines from around 1900 to 2010, but where the manufacture and/or development of the car has been done by others – not only Sports Prototypes, but single-seaters too, and we briefly dip into rallying, drag racing and midget racing. I hope this work, believed to be a first, will answer many questions for the enthusiast and newcomer alike. Never before has such detail of nearly all the known Porsche-powered racing cars been gathered together under one title. I say ‘nearly all,’ because it is certain that there will be assorted personal one-offs that have slipped through our net, and, indeed, space does not permit us to cover every home-built special. A few do make the cut, but the reader can be sure that after three years in the gestation, the research can definitely be said to have been diligent. However, if I have missed one or two, I apologise, and no, we haven’t forgotten about other Porsche-powered machines: motorcycles, Paris Dakar vehicles, tractors, boats and planes, which are well worth a mention in our final chapter.

Of the racing cars themselves. Some major names appear, such as Elva, Lotus, Cooper, Lola, March – all at some time featured a Porsche engine in their chassis. In the late 1980s and into the 1990s, the demand for the services and supply of cars, chassis and parts from Porsche sometimes outstripped the ability to deliver.

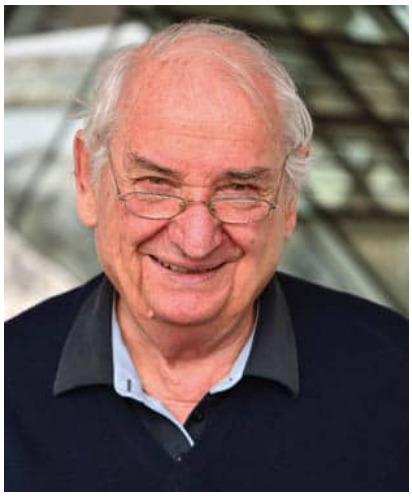
With many new projects in the pipeline in the rapidly expanding

Porsche organisation, race car projects had to be prioritised. This would lead to the creation of the ‘replicas,’ as opposed to the factory-built works race cars; in fact even Porsche was building ‘replica’ 935s to supply to clients. This philosophy was to continue into the 962 era. In turn, a whole new highly specialised, high-quality industry grew up to meet some of the demand for chassis tubs. Companies like GTi Engineering, Fabcar, Stickel, John Thompson’s TC Prototypes, and Jim Chapman Developments were manufacturing the monocoque chassis for the new ‘replicas,’ and repair or restoration of Porsche race cars. In turn, the likes of Lee Dykstra, Peter Dawe, Ekkehard Zimmerman, Nigel Stroud, Marcel Hubert, and Peter Stevens would influence the design of cars. The likes of the Kremer brothers, Joest Racing, Gebhardt, Brun Racing, Holbert Racing, Fabcar, Courage, for example, all created influential versions of Porsche-powered race cars. We have tried to bring not just facts and figures of the cars, but the racing stories, good and bad, a no-holds-barred history. This is an ‘alternative’ Porsche-powered race car encyclopaedia.

We see the birth of the racing dreams of the founder of the Porsche marque; the rise of Glöckler, who was to influence the entry of Porsche into international racing in the 1950s; the use of Coopers in the USA, and the alternative race cars from several race car manufacturers home-grown in the US; and the new creative racing 911s, 935s, 962s to come from Kremer, Fabcar, Gaaco, Schuppan, GTi and Dauer. Not forgetting the Formula 1 and Indy cars – all powered by Porsche engines.

As the author, I hope the reader will find the pleasure of dipping in and out of this story an easy task. So why not sit back, prepare for a lot of surprises, and enjoy the great race cars that were not always necessarily built by Porsche, but called upon the expertise of their customer race car services department, run by Jürgen Barth, technicians like Hans Mezger, Valentin Schaeffer and the all-seeing eyes and knowledge of Porsche guru Norbert Singer. Here we see the teams and the people who turned to Porsche to utilise the power from perhaps the greatest of all engine makers.

Forewords and personal introductions



Norbert Singer – a man with a vast knowledge: Mr Porsche Racing. (P)

Norbert Singer – Porsche
For me it was always very special to work with other teams or small manufacturers when they used Porsche components. I was only involved with a few of the 'other' marques, but I have very good memories working with the different teams, always in different challenging situations: Joest Racing, Fabcar, Champion, or even smaller teams like the many that ran the 962s. To select just a few to talk about does not mean that the others are forgotten; this is just a small collection of personal stand-out memories.

For instance, in 2000/01 I had the pleasure to work with the Champion Team of Dave Maraj. They had a Lola car and had fitted the rear end from one of our GT1 cars. This was because Dave Maraj wanted a reliable power-train. He was an important customer (dealer) of Porsche and wanted to use our engine, gearbox and suspension. For me and Mr Stegmeier, the engine engineer, it was a pleasure to work with Brett Kettler and the whole team. We did a lot

of tests on different circuits from Atlanta to Sebring, but mainly in Daytona, because they wanted to win that famous 24-hour race. We also got the car over to Weissach to examine the aero, and especially the air intakes for the restrictors. Even though we did lots of tests on the circuits, Mr Stegmeier and I were unfortunately not allowed to go to the race at Daytona in 2001. I think it was due to some political reasons. In 2001 we continued with testing – it was a good car; and then the same restriction to visit happened again for the Daytona 24 Hours in 2002. It was very frustrating for us to do nearly all the testing but not be allowed to go to the race. So we stayed at home. Now I don't want to say that if we had been there he would have won: he didn't win, but came home 4th.

Some years previously, there was the 962-Dauer-GT in 1994. It was not the same work that we were to have with Champion, or later with Fabcar. It was a complete car, which you will read about here in Roy's book. All the work was done in-house. We used the idea of Mr Dauer: he wanted to make the 962 race car suitable for road use. But also the rules had changed at Le Mans, and I saw that they had not specified a number of cars that had to be built for the then GT1 class. Dauer made the road car; we created a race car suitable for homologation, using Dauer's 962 road car as a platform for a GT-race car. First we had to get permission in-house from the Board, and here Mr Marchart, the head of Porsche development and member of the Board, supported the project. The other big challenge was to convince Mr Bertaut from ACO to accept our car as a GT-car, which was not easy. We had a very hard discussion lasting two hours, and at the end we got the permission to race, but only one time; he wasn't happy, but he had written the rules, and our car complied. Finally we were lucky: we won the 1994 Le Mans 24 Hours, and our second car came 3rd, too.

A similar project was the WSC car from TWR. The first ideas were to get Porsche a cheap and easy return in sports car racing in America. At first look it seemed a good idea. TWR had a Jaguar/Mazda chassis available, and through Alwin Springer at Porsche North America he offered us the opportunity to install the Porsche power-train into it. The idea was to race at Daytona 1995.

My first visit to TWR in Valparaiso was in October 1994, with the first test planned for December. But when I arrived and saw the situation, we had to get more people from Weissach to the USA, to stand any chance of being ready. Finally we had 10-12 engineers there – mechanics, chassis designers, engine men. The first test would be at Charlotte. At that December test, unfortunately the car was crashed (again, the full story is here in Roy's book). A quick repair was necessary to get ready for the official Daytona Test on 7-9 January. The test went okay, but we were nearly 3sec slower than the fastest car. It is a 24 hour race, so lots of things can happen. But after the test, IMSA penalised the car with an extra 46kg weight and smaller restrictors; that meant 15% less power. With the car already 3sec slower, it was not possible for Porsche to race. We cancelled the project, but I got the cars to Weissach. Reinhold Joest knew the story, and later in spring 1996 he came up with the idea to run that car in Le Mans, but it was impossible to run it as it was. We spent a lot of time in the wind tunnel to bring the car up to a level that it was safe to race with. It was a near full Porsche effort and the car took victory at the 1996 and 1997 Le Mans.

I recall with pleasure, in autumn 2004 Dave Klym of Fabcar called me, and asked for some support for his car, the new Daytona Prototype. I suggested we could help with some time in the wind tunnel and on a chassis rig. So we got his car over to Weissach – I think it was in November. I had very good relations with Dr Müller, who was in charge of the wind tunnel then, and we worked out a plan to do some wind tunnel tests when the tunnel was not being used by somebody else. However, there were no mechanics free to do the important tests to improve the stiffness of the chassis. Luckily I had contact with a young engineer, Mr Göhrke, through my other projects. He was doing all kinds of analyses on a computer for different car components. I asked him if he could support me with his equipment for the Fabcar. He was very happy, because he also liked to work on a complete race car instead of components. After two or three weeks, we had collected sufficient data from the car, and we were able to give Fabcar advice to improve the aero and the chassis. At the next test at Daytona in January 2005, we could see that the

improvements we suggested were working: mission accomplished.

Throughout my career, I have had great pleasure in working with our customers that used our engines and components, and if they were successful we were happy to see they were powered by Porsche.

Norbert Singer
Germany

Jürgen Barth – always helpful: Mr Customer Porsche Racing. (P)

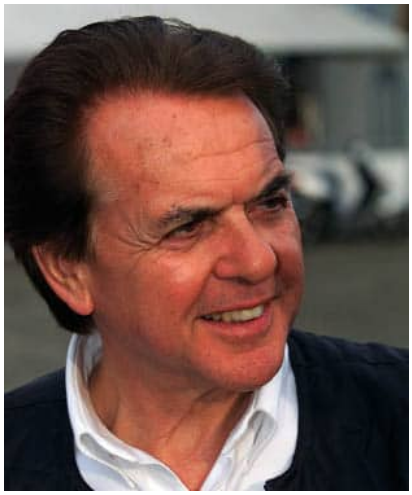
Jürgen Barth – Porsche

I had started working at Porsche in 1963; my father Edgar had begun driving for Porsche in 1957. My mother and I had to flee from East Germany the same year to join him, as it became too dangerous for us to remain. I was 10 years old. My father, as well as driving for Porsche, also had the job of instructor at the race driving school at the Nürburgring; I used to help him often. He used to stand on the outside of a corner with his pupil, telling him to watch what I did – I was driving the car! He had taught me, and to show the way through the corner, he used me driving a 356 Carrera to demonstrate the line, driving slowly, but the funny thing was, when he couldn't see me anymore as I went round the next corner, I accelerated. I got to know the Nürburgring quite well!

When I was old enough I did two apprenticeships with Porsche, one mechanical and the other business studies, following which I went into the Porsche Press Dept with Huschke von Hanstein, as my father had done before – that was one of his jobs. I was looking after customers, organising press and press show events, presentations of new cars, and then, eventually, I got heavily involved in the administrative organisation of motorsport and the homologation of all the factory cars. Porsche, since the early days, had developed a high reputation for the quality of construction of its vehicles, many of which were supplied to new and established racing teams as customers of

Porsche. This meant we had created a Customer Racing Services operation to support our cars, and also many others who, by the 1970s, were building their own cars to race using Porsche engines, the Porsche sales idea being to ensure that the customers received good service and always had parts available. This was essential to our business, and, indeed, if our own cars were beaten by a customer team using our engines, we did not really mind, because it exposed Porsche to future customers via the press and TV, etc, demonstrating the quality of our product. We put great emphasis on our interest to help the smaller teams to get them on the grid. When Roy asked me if I would write a foreword after I did one for him for his book about the 924 Carrera (a car close to my heart as I had developed my rally driving that led to many years racing success), I agreed, because this work is the first to show in great detail the use of Porsche engines in the racing cars of our customers from the beginning in 1950 to more recent times, a period over which I was personally involved with almost every client since the 1970s.

Jürgen Barth
Germany



Reinhold Joest – Chef d'equipe for one of the top Porsche customer teams. (JR)

Reinhold Joest – Joest Racing

My first adventures in motor racing began in 1962 with a Porsche 75S at the Eberbach Hillclimb. Fortunately, successes came, and I won the German Championship twice. I went on to compete in circuit races from 1966, taking a class win that first year at the 1000km race around the Nürburgring, winning the race in 1970 and 1980. Porsche were always my favourite marque, though I did finish 3rd at Le Mans in 1969 in a Ford GT 40. I really wanted to win Le Mans in a Porsche, but could only finish 2nd as a driver, in 1978 and 1980. But this would be turned to victories as a team owner, so we did get there and with good fortune many times.

I had a dream to create my own team, and in 1978 founded Joest Racing GmbH in Abtsteinach. We started out on the trail to become a top racing team. Already we were in good relationships with Porsche, and we set out to improve the 935 model from Porsche, making many modifications and racing in the German National Series as we found our way, then International racing, which led to me, Rolf Stommelen and Volker Merl winning the Daytona 24 Hours in 1980. Porsche had created the 935/78, and we acquired a chassis to build our own car, which became the JR (Joest Racing) 01 which we raced through 1981, and Gianpiero Moretti ran in 1982/3. JR2, another 'Moby Dick'-styled 935/78, followed. Then the new Group C regulations came

about (1982), and Porsche were unable to supply us with one of the new 956s. We were very keen to be part of the World Championship, and decided that we would create a competitive car from the existing 936 model with which we had achieved some success in running in concert with Porsche. We called it the JR-005, a 936C tube-frame chassis for which we created a covered cockpit bodywork, and we had made it together with Herr Zimmerman at DP. This, like the JR-01 and 02, was an all Team Joest-built car, which raced on until 1986, achieving many top three finishes. We did eventually run the 956 at Monza in 1983, where we won with Bob Wollek and Thierry Boutsen. But the factory Porsches won the rest of the races! We acquired a 956B in 1984, and we at last won the Le Mans 24 Hours, repeating the performance with the same car in 1985, even though the new 962 was then becoming the car to have. We acquired our first 962 chassis in 1985/6. It was a honeycomb-type aluminium monocoque, from which we built the car with the engine coming from Porsche. It first ran at Daytona in 1986, but did not finish. Meanwhile we continued to race the 956 Le Mans winner, and we won again at the Fuji 1000km in 1986. In 1987, with the 962, we finished 4th at Sebring. All the time we were working closely with Porsche as racing management as well as building more 962s. When Porsche announced their withdrawal from Group C racing as a works team in 1987, we were called upon many times to help with their customer cars, also building cars from Porsche-supplied chassis. Joest Racing was 3rd at Le Mans in 1988, and 3rd in the 1988 Team World Championship, 3rd again at Le Mans in 1989, and we finished 2nd in the Team Championship points that year. In 1990 we were officially nominated the factory team for Porsche, running two works and two more private cars in the ‘new rules era’. In sporting terms it wasn’t a good year, but the factory deal meant that the team moved into completely new and bigger premises, now in Wald-Michelbach. 1991 saw us win the Daytona 24 Hours, but we didn’t run in all the World Championship races. It was a difficult time for all the regular teams in the early 1990s, so we turned our attention to the USA. Porsche themselves in unison with Dauer in 1984 built a special GT car, in which we were involved with the racing management, to win the 1994

Le Mans 24 Hours. There was a lot of talk about Porsche racing as a factory team in 1995 with the TWR cars, but it didn't happen. However, when they acquired the cars from the aborted project I met with Mr Marchart to speak about these cars. We and Porsche agreed to develop and run the WSC cars at Le Mans in 1996. I had a deal that if we won I got the winning car. Ralf Jüttner put together a great racing strategy and we won, with the second car having a dnf after also leading at stages. We won again with the same car in 1997. After this the times were changing; the Porsches were no longer competitive, or there were no cars for the current rules. We at Joest ran a racing team, and as such needed to look elsewhere. After three years with Opel in the DTM/ITC, which ended with the title in 1996, most of the readers might know about our great successes with Audi, and right now we are looking towards the future with a new direction and a new programme.

It has to be said, though, that from the late 1970s, for nearly 20 years, all our cars were powered by Porsche, and I and the team here at Joest Racing are delighted to see our work recognised by Roy in this huge work on marques powered by Porsche, and are proud to have been part of Porsche racing history.

Reinhold Joest
Germany

Manfred Kremer and his wife 'Bibi' – four decades at the top. (AS)

Manfred Kremer – Kremer Racing

When my brother Erwin (sadly no longer with us) and I founded Kremer in 1962, it was the start of a quite unbelievable racing history. Now, more than 50 years later, the company we registered as Kremer Racing in the 1970s can look back on many exciting years, full of highs, and sometimes lows.

We ended up winning all the 24-hour classics over the period covered here in Roy's book. Victories in the top league of racing came often, and at Spa in 1968, with a 911, we had our first taste. Many times we acquired and modified cars directly from Porsche, the K1 and 2 being examples. At Le Mans in 1979, with a car designed and constructed by ourselves in our own workshops, we took a famous victory, the car being the very quick K3 based on the Porsche 935.

After the 935-type cars, the last being the K4, we created our own Group C contender in 1982, because we could not then buy the Porsche 956. Built by ourselves again, it was the quite innovative CK5. This was followed by the Porsche 962 cars, several of which we again built up from bare chassis into a series of successful race cars, the CK6s. These too we developed, and in the 1990s the result was the K7 and then the K8, a car designed once more by ourselves at Kremer, based on the Porsche 962-type chassis which we took to the USA to participate in the Daytona 24 Hours in 1995. It won.

Looking back now, we know we played our part in the history of motorsport. Going racing every week-end was just part of a great life, which we enjoyed, and generally helped many young drivers on their way. Unfortunately in motor racing it is not all sunshine, and sometimes there were dark moments, the bad times, which everyone hated. But whatever happened, we had nearly always been on the starting grid for the next race … a sort of addiction, isn't it?

My brother Erwin and I could say we were proud of our achievements, which we had been able to realise because all the time we had a great team. For that team and all friends of Kremer Racing, we can see here the history of the powered-by-Porsche cars that were created and built by Kremer.

Manfred Kremer
Co-founder of Kremer Racing
Cologne

Dave Klym – chassis builder par excellence! (DK)

Dave Klym – Fabcar

There's nothing like messing with racing cars, and if you can make a living at it, there's nothing better. Looking back on 40+ years of racing every kind of car imaginable, whether as driver (we can draw a discreet veil over that period) or as mechanic, crew chief, team manager or, lastly, as a designer, fabricator and constructor, I have had the joy and the privilege of meeting, working with, beating and being beaten by some of the most interesting and, yes, sometimes strange characters that you can imagine. And I've loved every minute of it.

One of the most special relationships I developed over the years when I was the owner of Fabcar Engineering, producing pro series road racing cars, was with the men of Porsche. I look back and marvel how my love of racing cars propelled me, and ultimately my crew at Fabcar, to the top of the car building world. It all started modestly with a job with Charlie Hayes, a move to the West Coast of the USA, and a fabrication job with Dan Gurney and his All American Racers, where we were building Indy and F-5000 cars. Ultimately, I crew-chiefed and managed Fred Carillo's Indy car team and won mechanic of the year in 1977. Which brings me to Fabcar. I set Fabcar up in Costa Mesa, California, and started off building a series of 11 'Wheeler' Super V cars, and a couple of Shaklee CanAm racers. In 1979, we built three David Bruns-designed Lightning Indy

cars for Lindsey Hopkins. These were among the first ground-effects cars to run at Indy. By 1980, we had relocated to Atlanta to be closer to more road racing venues.

We built a couple of four-rotor Mazda GT cars, as well as two show cars for the Mazda factory, but Porsche equipment entered the scene at Fabcar with a commission to build two Camel Lights cars with Porsche power. The first car won its first race at Road Atlanta with Elliott Forbes-Robinson driving.

As we practised our discipline, our Porsche-related projects excelled. Porsche's equipment was always well-engineered and reliable. Our cars with Porsche power were always quick. I think of Bob Akin's 935-84, which turned out to be one of the fastest 935s of the period. Lee Dykstra designed the notorious JLP-4 for John Paul Racing, and that built on our reputation as pretty good Porsche 'hot-rodders'. Tube-frame 911 race cars became a bit of a specialty. Alex Job used one to win Sebring. I guess we were doing things right, because Porsche Motorsport here in the USA asked us to design and build seven tube-frame TransAm 944 cars in 1984. Even at the beginning, I was struck by the supportive and helpful attitude of the men from Stuttgart. Once they saw how we ironed out accident-damaged 962 Group C car monocoques, it wasn't long before we found ourselves in the monocoque fabrication and repair business as the official Porsche repair facility worldwide. Not far behind came the fabrication of Porsche suspension components for the same market.

The 1990s saw us asked to build nineteen 962 chassis tubs for Porsche Werk in Stuttgart. In all, we restored and repaired many 962s, as well as those made under contract. We also built a mid-engine Porsche 911 IMSA car, designed by old collaborator Lee Dykstra. Later in 2002 we were asked to build and prove the first Daytona Prototype cars under a contract with Grand Am and NASCAR's Jim France; many of those cars, made by us and others, had Porsche engines.

Through all this, Porsche were the best of collaborators. I remember when we took our Fabcar Daytona Prototype to Weissach, and put it through an exhaustive series of physical and simulation-based diagnostics, engineering analyses and critiques.

Porsche absolutely helped us get that car to the next ‘Evo’ level. Norbert Singer recognised and respected our accomplishments and then built on those. Porsche knew what it took to be successful and they would do it for us every time, one hundred per cent. They were simply exceptional partners. This terrific book shows the depth and breadth of Porsche-based components and engines in top-level international racing and the many marques of car that they went into.

For me, this book is a tribute to so many of the great times, the tough times, and the sheer excitement of the era, in our case over four decades. I hope you enjoy it.

Dave Klym
Naples, Florida

Hans Mezger – the brain behind nearly all the Porsche engines from the 1960s air-cooled to the water-cooled era, a race engine guru. (P)

Hans Mezger – Porsche

The overall performance qualities and proverbial reliability of the Porsche engines is well known all over the world. They have made the Porsche road and race cars much sought after, and would become very successful. It wasn't just Porsche using Porsche engines. There have been quite a few customers and non-Porsche vehicles using Porsche power. Above all, it was the legendary flat-six, its reliability, and its versatility that has set a standard not matched by any other engine, and customers have used the 911 engines to power many different means of locomotion, ranging from an airship to an Indy race car.

During its long career, the flat-six 911 engine was developed continuously, passing through many different periods of technology, beginning with the air-cooled version, then water-cooled, normally-aspirated, and turbocharged; we kept the design up to date with ever-developing technology, whilst meeting the demands of the regulations for competition for nearly four decades.

Transferring the turbocharging technology from the 917 CanAm turbo cars to the 911 road car engine in the seventies was, I think, the most important development step of the flat-six, opening up a great career in motorsport. In the seventies, the eighties and the

nineties, the race version of the 911 turbo engine helped the 935, the 936 and the Group C cars to become World Champions, and to achieve no less than 16 Le Mans victories in the period.

It was early in 1963 that Ferdinand Piëch and I had started to work on the six-cylinder engine. Ferdinand Piëch took the experimental part and I took the design part. It was the development stage two of the engine (Type 821) that we started with. We knew there was a lot of work to be done. But we were both young and ambitious, and we were not afraid of working hard on a project like that. The effort was worthwhile and we had great fun as well. All the experience gained from racing was transferred to the new engine version Type 901/911. I was able, too, to use the latest knowledge I had gained from 1960 to 1962, when I worked on the 1.5-litre flat-eight Formula One engine, Type 753.

There has always been a close connection between racing and production development in Porsche. Ferry Porsche used to say that Porsche participates in motorsport in order to build the world's best road sports car. I made that my philosophy, too, during all my time at Porsche. In 1965 I was appointed head of a new department, 'Design Office Racing Vehicles' (Konstruktion Rennfahrzeuge), responsible for racing engines and chassis design. This new role signalled the start of modern chassis, using a new generation of wide wheels and tyres. We started with the 'Ollon-Villars' hill-climb car in 1965, followed by the 910, 907, 908, 917. In the 1970s we were pioneers in the new turbocharging technology, both in racing and on the road. 1976 saw for the first time a turbo-powered car win the 24 Hours of Le Mans, a Porsche Type 936. It was the breakthrough we had been seeking.

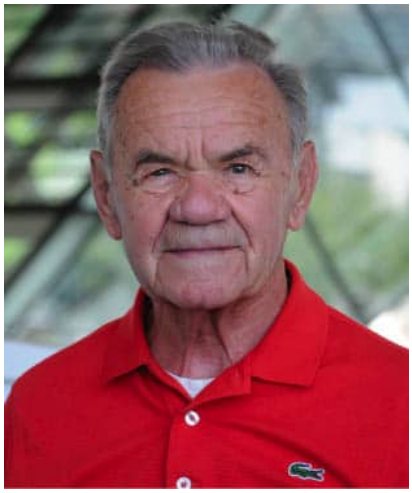
One day in August 1981, Ron Dennis from McLaren and his chief engineer, John Barnard, came to visit us at our facility in Weissach. They were looking for a Formula One turbo engine. One that was capable of winning, Ron Dennis emphasised. It was a short meeting, but we reached a good understanding very quickly. In November after four more discussions, a contract was signed and the Formula One project was started.

I had only six months to design from the beginning, with a clean sheet of paper, the layout to define the engine. We did it and I got the

feeling that the project would be successful. Mansour Ojjeh from the TAG group had taken over the sponsorship of McLaren and to reflect this the engine carried the name TAG Turbo, not Porsche. I didn't worry about it, because it was a situation that was known to us. The TAG Turbo was the most successful engine of the first Formula One turbo era in the eighties. In 1984, 1985, and 1986, three World Championship titles were achieved by Niki Lauda and Alain Prost in the McLaren car. In addition, McLaren won two World Championships for Constructors. The project had been the most important consultancy order put on Porsche in the postwar era and a motorsport highlight for our team at Weissach. I remember a friendly but quite tough discussion with Ron Dennis in 1983 about the name on the engine. TAG was insisted upon, but I also said it might be good to see 'Porsche' – as a dedication for a good job – on the engine too. Ron Dennis smiled; he appreciated our work, and agreed to use a discreet plate saying 'Made by Porsche.'

This Powered by Porsche book written by Roy Smith, a well-known author of two interesting books on Porsche already, is a study that has not been written before, and when Roy suggested that I might like to write a foreword, I immediately remembered my discussions with Ron Dennis, and all the engines before that, in which I'd had an input. I agreed straight away to do it. I think all friends of Porsche will learn some details they have never heard before – perhaps me, too!

Hans Mezger
Stuttgart, Germany



Valentin Schaeffer – Porsche racing engine development genius. (P)

Valentin Schaeffer – Porsche

I have been involved with Porsche and the engine department since 1955, until I retired. One of my first engines that I worked on was the four-cylinder, four-cam Carrera engine. When I came to the factory I was only a young engineer and I worked first in the factory and then in the race shop. I had to work half a day in the design shop and the rest in the engine department for a couple of years. Eventually I worked on the eight-cylinder F1 engine and, of course, the sport cars.

In around 1963 I was working with the engine team to create and develop the 901-911 flat-six engine. Luckily our boss, Mr Piëch, liked my work and when our engine team started to look at turbochargers, I was moved into the position of studying these things which were being used a lot in the USA: Offenhausers, etc. Of course there was nothing really new; they had been used before the war on aircraft. We discovered many things about the internal workings, especially the speed of the fan in comparison to the size of the turbo and its adjustability to create the required boost. The problem was always at that time how to change the acceleration – the turbo lag, as it is known, was terrible. I remember when we started we didn't know how to make it more driver friendly and get more power quicker. I made a hole in the exhaust to let the air escape, and we measured it with mercury pressure. The first time we attached the mercury meter

it blew the top off over our heads! We had to control it. One day I was at a test in Florida with John Wyer, and they said I should come with him to see some dynos where work was being done on an Offenhauser engine; it was there I saw what was called a wastegate. They gave me one to bring back to Weissach. That was when we were able to start real development; we started playing with controlling the diaphragms, etc, within the wastegate. On one test before we sorted the lag out, Jo Siffert was driving at Hockenheim when the power came in so fast he shot off the road, straight into the woods!

Of course we mastered all the problems, and, as the years passed, I worked with Mr Mezger in the development of all the racing engines in the 1970s and 1980s. We did work for Joest, Kremer – almost all the teams outside of Porsche that were using our engines, and when it was decided that Porsche would try to race at Indianapolis, I was asked to help design and then build the engine, and go over to install and test the engine in the Interscope car. Mr Bott was the chief at Weissach, and he said to me we should use not only our engine but our gearbox, too. I was working there with Jim Chapman, who had been brought in to sort out the chassis. I went many times to the USA – they were really nice people, Jim and his wife Debbie; the story of that car is in Roy's book here. That project was cancelled in the end; I think the American rule makers were too frightened that our engine might take over from their USA engines, so they put restrictions on our turbos and air intakes. I worked on the later successful Indy-type cars, too, in the late 1980s. Many times I was working on the 962 engines, especially with Al Holbert. I went over to the USA maybe 15 to 20 times! CanAm too, with Vasek Polak, with the big 917. Later it was helping with the dyno tests as well as the races with Andial and Alwin Springer, that meant I had to go to the USA many times more.

There are so many memories, and it's been a pleasure to help Roy to record here a history of the cars that were used and often built by our customers, but always where they used Porsche engines. Most of the time we were successful, but we always learnt a lot when things failed, too: that's development, something Porsche was, and

still is, always doing, seeking the extra performance. I am pleased to have been a part of such an important racing history.

Valentin Schaeffer
Stuttgart, Germany

Vern Schuppan – works driver, team owner, creative thinker, businessman and all-round gentleman. (VS)

Vern Schuppan – Vern
Schuppan Racing

At the age of 14, I left school to work for my dad as a panel beater and spray painter. In my hometown of Whyalla in South Australia there were just three sports cars: an Austin Healey 100, an MGA Twin-Cam and a Triumph TR2. There were no Porsche 911s; these were beyond reach, and my mates and I could only dream of possibly one day owning a sports car. Then in 1968 I almost realised this dream.

I had been approached by a pal in the UK about providing – and driving – a support vehicle in the Perth to Sydney section of the London to Sydney Marathon. The car, a Lotus Cortina, was sponsored by a British film star, comedian Terry Thomas. Some months later and 2800km east of Perth, literally in the middle of nowhere in the Australian outback, we came across the blood orange works-prepared Porsche 911 driven by Polish ace Sobieslaw Zasada and co-driver Wachowski, both feverishly carrying out makeshift repairs on the 911's broken front suspension. Zasada happened to mention to me that the plan was to sell the 911 in Sydney following the end of the event, and if I was interested, we could try and work something out. Unfortunately that didn't happen; however, at the same time, I could never have imagined the relationship that would

develop for me with Porsche years later. Just one year on from this encounter with Zasada and the 911, my wife and I sailed to England in order for me to embark on a motor racing career.

It is often said that being with Porsche is akin to being with family. I experienced this, following my first race as a Porsche factory driver at Le Mans in 1981. I'd just finished 3rd in the 1981 Indy 500, when I received a call from Manfred Jantke to ask if I would co-drive one of two 936 Porsches entered at Le Mans with Jochen Mass and Hurley Haywood. Although in the race we were unfortunate to suffer a long pit-stop, requiring removal of the gearbox, we had nevertheless fought our way back up to 2nd place, only to have a fuel-injection problem strand the car out on the circuit. Via yelled instructions from Valentin Schaeffer on the other side of the Armco, and a bit of intuition and sheer luck on my part, I managed to get the car running and back to the pits. Ickx and Bell won, and it was during a rowdy and great celebratory dinner that night that Mr Bott told me that the mechanics had named me 'der fastest mechanic in der Vorld!' I'll never forget the feeling of being accepted into this Porsche family, a very happy relationship that extended for many years and many races, both as a driver and later with my own Team Schuppan 962 Group C cars in Japan, Le Mans and Daytona.

In 1987, my fourth year of driving the Team Trust Porsche 956 in the All-Japan Sports Car Championship, I was approached about the possibility of preparing and entering a Porsche 962 in the 1988 All-Japan Sports Car Championship, for Rothmans Marubeni. This was followed by an enquiry from Omron about also having a car in the series, and another from Japanese financial services company Takefuji for the 1988 Le Mans.

For the Takefuji effort I purchased one of John Thompson's excellent honeycomb/aluminium 962 tubs. Chief mechanic Michael Negline, along with a talented team of guys, built the Team Schuppan Le Mans-spec Porsche 962. I hired Brian Redman, Jean-Pierre Jarier and Eje Elgh to drive, and although the car ran competitively for most of the race, it was unfortunately hampered by two broken exhaust systems, each requiring a lengthy pit-stop.

During 1989 I made the decision to develop a carbon/composite

962 chassis for our race team. The task was undertaken by UK aerospace composite specialists Advanced Composite Technology (ACT). Around this time, Porsche made the decision to terminate production of 962 tubs, and I discussed with Norbert Singer our plan to produce the carbon tub. Mr Singer liked this idea, and assisted enormously by providing ACT with a full set of 962 tub blueprints.

When the first carbon tubs arrived, one was immediately dispatched to Mr Singer for torsion testing and evaluation. Surprisingly, it was found to be of similar rigidity to that of an aluminium tub. During the 1988 season I was contacted by one of the principals of Kosho, a branch of the huge Japanese Nomura Corporation, to discuss the possibility of building a street-legal 962 Le Mans car. Kosho specialised in golf course and hotel construction and, in a rather offbeat idea, Kosho's plan was to sell a car to each golf course/hotel owner.

Kosho gave an undertaking for an initial batch of 25 cars. We developed and extensively tested the road-going Le Mans 962 prototype and completed emissions testing and various government approvals and tooling for the first production car. Unfortunately, with the arrival of the 1989/90 financial crisis the golf course and hotel market collapsed. What appeared to be a fortunate turn of events, however, was when the project was taken over by premier exotic car company Art Sports of Osaka. This story is long and complicated; however, in short, Art Sports had banked on selling the cars 'off plan.' It didn't happen; this had a knock-on effect on our whole operation and eventually I had to close it down. The whole story of the team and our activities is all here, in Chapter 6.

They were great days working with Porsche, both as a driver and later as a customer; the camaraderie was exemplary.

Vern Schuppan
Adelaide, Australia

Chapter 1

The power of Ferdinand Porsche – Lohner to Cisitalia

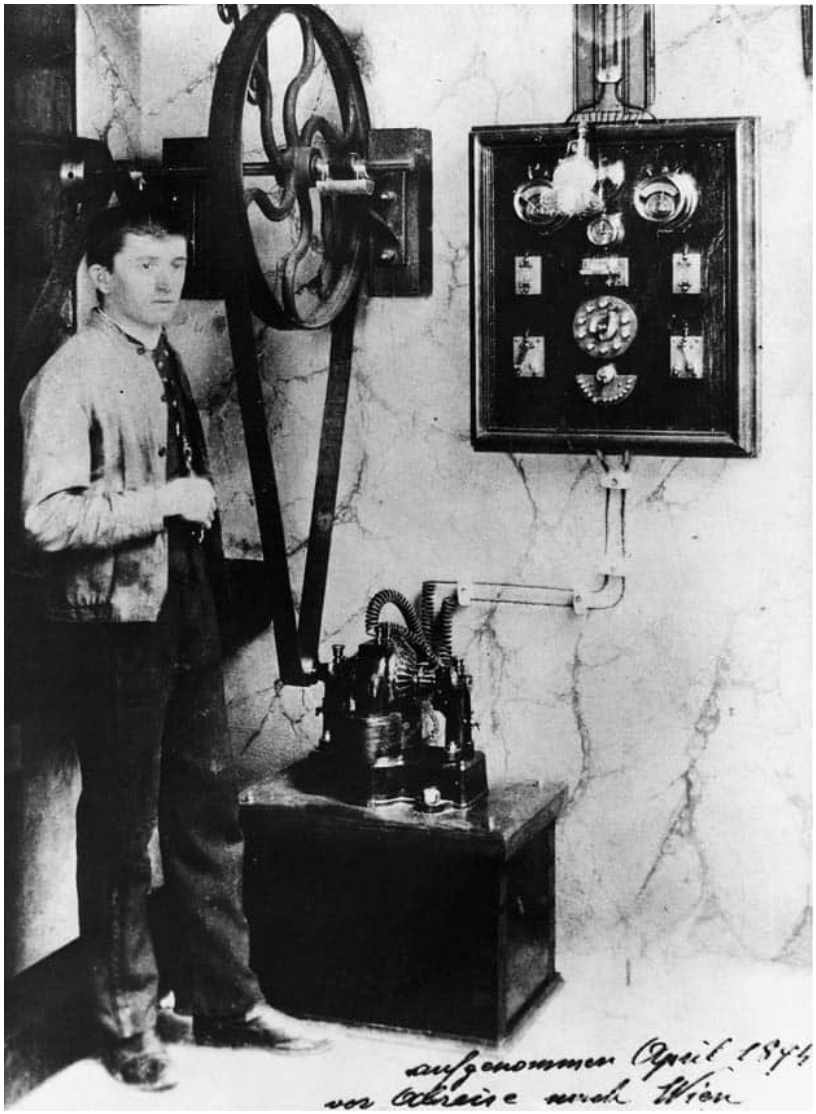
We begin our story with an introduction to the very first cars that were powered by Porsche ingenuity, which in turn led to the power units designed and created by the companies Ferdinand Porsche worked for. Where possible in each case we see original period images. The purpose of this is to set the scene for what is to come in the following chapters. Remarkably, we go back almost to the dawn of motoring. The foresight of the genius Ferdinand Porsche was clearly incredible, especially when one thinks of today's hybrid racing cars. For a start, you might think that a liquid fuel combustion engine, working in concert with electrical recovery to power a car by electric motor, is a recent development. And what about all the latest electric cars? A new idea? – no!

Let us look into the past to see why his ingenuity was so incredible. If you are familiar with everything about the early days of the Porsche story, please bear with us in this chapter, because there are many who might not know that the name Porsche arguably had a more impressive influence on the world of motorsport than all others.

It is recorded that Ferdinand Porsche came from a family whose head in the late 18th and early 19th century, Wenzel Porsche, worked for the local squire in an area known as Reichenberg. The region, then known as Bohemia, was part of the old Austrian Empire. Vienna was its central city for all administrative purposes. Ferdinand's forefathers were all working tradesmen, carpenters, plumbers, even clothing and textile manufacturing workers. His father Anton, a plumber, was born in 1845. It was into this environment that Ferdinand was born on 3 September 1875, the third of five children born to Anton and his wife Anna Erhlich, who came from Ruppersdorf, where they were married in 1871. From the study of

Ferdinand Porsche by Richard von Frankenberg, we learn that the family were fairly ordinary folk of the time, though Anton was to become vice-Mayor of Maffersdorf, their place of abode. Ferdinand, it seems, started to show talents beyond those of his immediate family quite early on in his life. He attended the compulsory secondary school in Maffersdorf (today Vratislavice), and already his ideas and capability were a source of angst between him and his father Anton, and indeed some of the rest of the family. Tensions came to a head when Ferdinand was 15; in his father's opinion, he was spending an inordinate amount of time conducting electrical experiments, instead of working in the tin-smithing business where he had found a job, as his father wanted. The reader needs to know that electricity was still in the early stages of development, and it is certain that few – if any – in Maffersdorf had electricity in their businesses, let alone their houses.

Ferdinand had made a breakthrough in his experiments, and wanted to develop his ideas regarding the storage and delivery of electrical current. At this time the study of electricity and its applications was still in its infancy: English scientist William Gilbert had begun studying electricity and magnetism in the 1600s, but it wasn't until the 1800s, when Alessandro Volta invented the battery, that the term 'volt' entered common parlance, and it would be many more years before this form of energy storage would see truly practical usage. In the 1880s, Thomas Edison had brought electric lighting to Maffersdorf, via an agency in Budapest, but it was still a mystery to most people in the small town. Young Ferdinand was fascinated by it, and was one of several creative thinkers to apply his mind to the practical uses of electricity. However, Ferdinand's father, Anton (a plumbing engineer), disapproved – they were a simple family; such high-minded ideas were not for them, and he tried to block everything that Ferdinand wanted to do.



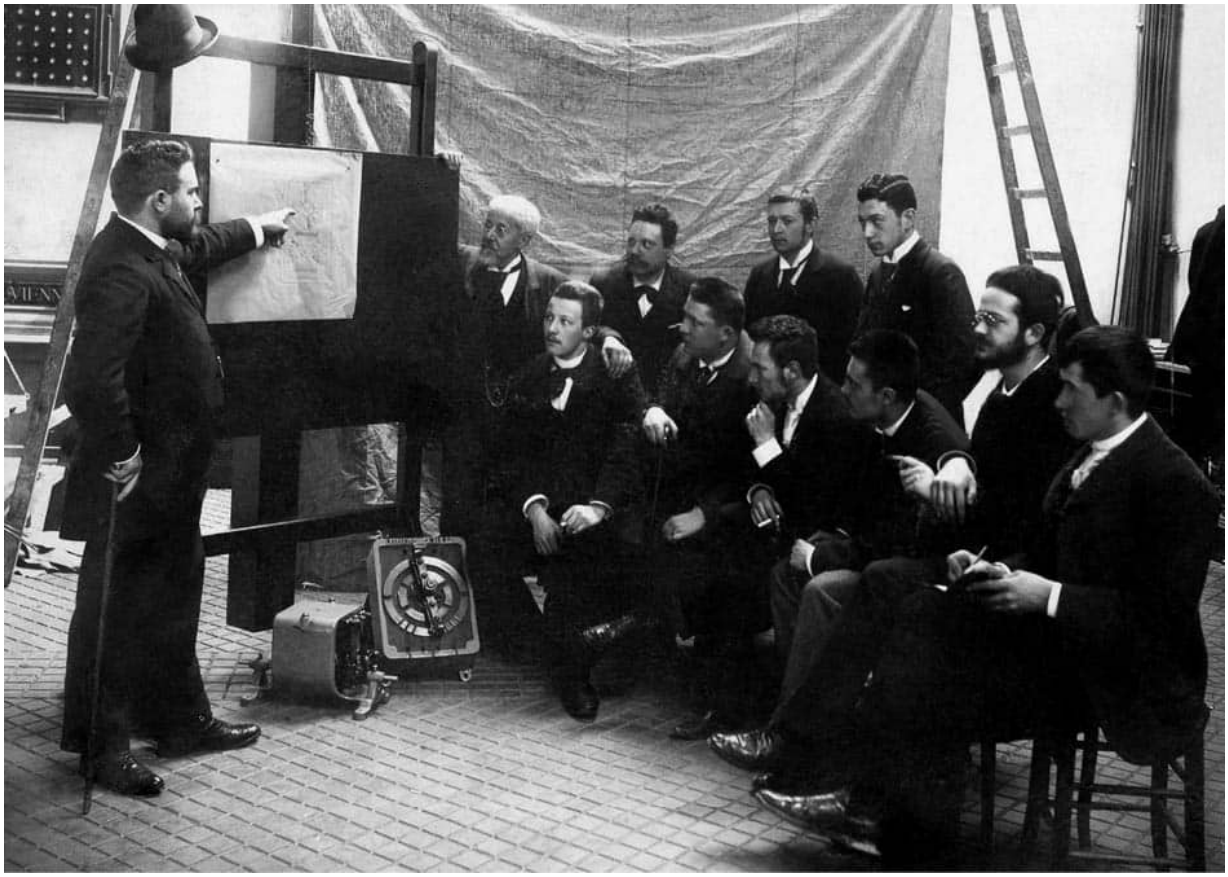
1893/4, Ferdinand Porsche in front of an electrical system which he built in his home. He attended the compulsory secondary school in Maffersdorf, while also doing a course on electrical engineering in Reichenberg (now Liberec) with Professor Joseph Pechan. (P)

But as is the way with those blessed with genius, his father's reproaches were merely an obstacle to be overcome. Ferdinand decided, though, to placate his father and to work in the metal-working business during his working hours – often 12 or more a day – while at the same time setting up a secret place to continue his experiments in the loft of the family house. His mother helped him to keep knowledge of his secret studies from his father, but he was

found out and a row ensued. To his credit, his father did realise that perhaps he should let his son continue going to an evening class at a technical school in Reichenberg, having initially refused to allow him to go to Vienna to study. But he still had to work: he had a good, safe job!

The words ‘good’ and ‘safe’ with regards to a job were not in Ferdinand’s vocabulary, and his father had a great surprise coming when he had to go away on business for a couple of days. Ferdinand had already paid a visit to the local carpet factory, where he had been informed that it had recently installed electric lighting. Ferdinand’s sister, Hedwig, was married to a senior employee of Ginzkeys (Carpets) factory. The owner was soon told about Ferdinand, and was very impressed by the young man.

As Anton Porsche approached his home on his return, he saw light emitting from the windows of his house. He found the teenage Ferdinand had built a generator, a switchboard, and a complete installation producing electricity! Initially, Papa Anton was not impressed, but Ferdinand persuaded his father to go and see the owner of the carpet company, with whom he (Ferdinand) had been in contact. Herr Ginskey told Anton Porsche that he could help his son get a job at the Bela Egger company in Vienna (note: some records in the Porsche archive say it was Vereinigte Elektrizitätswerke AG – these are one and the same) where Ferdinand could work, and also attend technical school to advance his theoretical knowledge alongside his accomplishments and practical capabilities. Anton was persuaded, and, at the age of 18, Ferdinand had begun his climb to fame.



Ferdinand Porsche (sitting front right), at the Bela Egger company, in Vienna, during a meeting with company manager Wessel and engineers. Ferdinand Porsche had joined Bela Egger & Co, and within four years was head of the test room. (P)

It is said he had a sixth sense when it came to solving problems. Within four years he was appointed manager of the testing department, and it was due to this appointment that he was to attract the attention of a company wanting to build a self-propelled electric car. That company, dating from the early 19th century, was called Lohner – a luxury carriage manufacturer, and its boss at the time, having taken over from his father, was Jacob Lohner.

Lohner and Porsche – the first 'Powered by Porsche' racing car

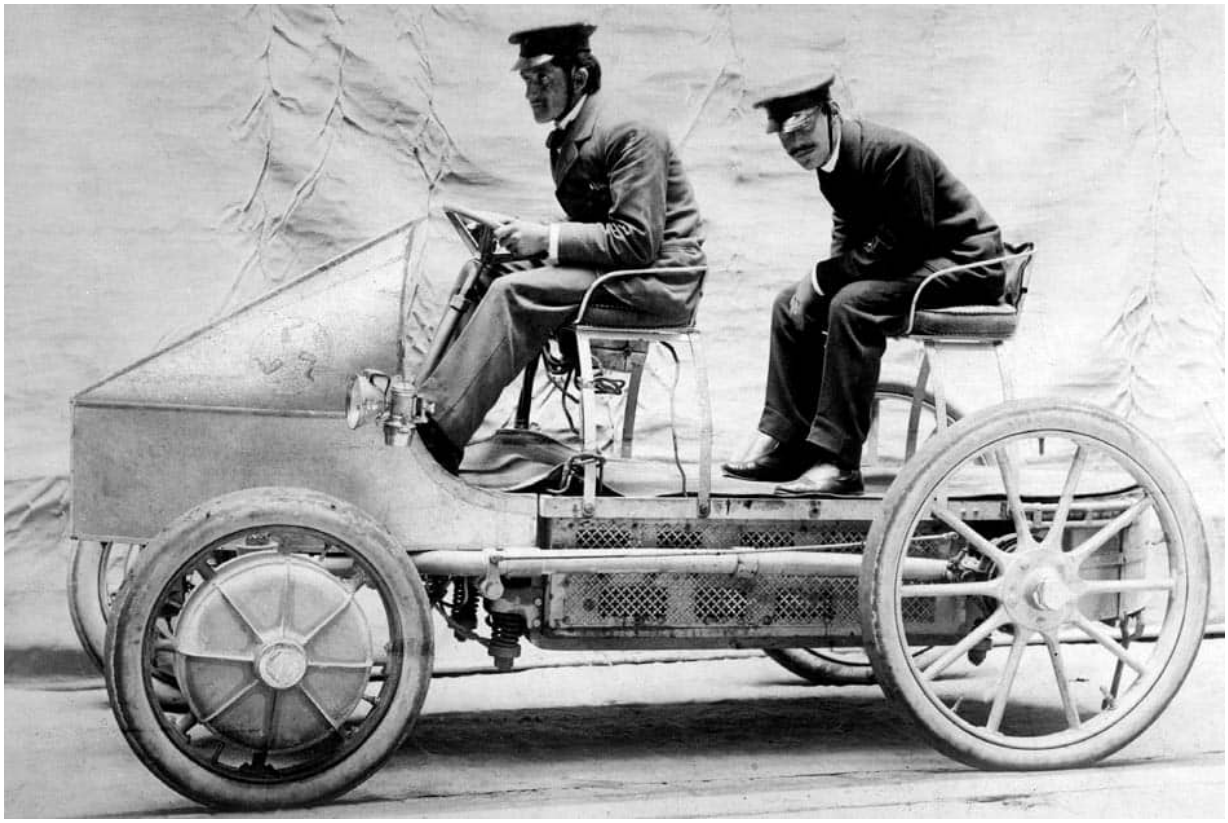
Ferdinand Porsche had made his mark at Bela Egger. In 1897 he had reached a ground-breaking moment, when he created an electric hub motor that could be used to supply the motive drive for a vehicle. This

is what led the 22-year-old to change his employer. Self-propelled vehicles were, at this time, being seen as the replacement for the horse, and the Lohner company knew that, in order to build a competitive vehicle, it needed expertise. While some companies were turning to the new petroleum-fuelled engine route, following in the footsteps of Karl Benz, Lohner wanted to go in the electric power direction. Hofwagenfabrik Jacob Lohner & Co had found its man, an electrical genius with a vision, to work in its newly created Electric Automobile department. Porsche had discovered that if he reversed the way a conventional electric motor worked, by making the armature rotate around a static magnetic field, instead of vice versa, and fixed the rotating part to the wheel, it would propel a wheeled device, giving it motion.

The first front-wheel drive Lohner Porsche vehicle, electrically powered from batteries supplying current to the electric hub motors, displayed at the 1900 Paris World Fair. (P)

At Lohner, Ferdinand was able to stretch his imagination, and he

went on to create a series of vehicles, one of which culminated in what may well be called the world's first hybrid car, using a pair of De Dion petrol engines to drive generators that maintained an electrical top-up of the batteries which provided the motive power in the design, and so using fewer batteries which were, of course, heavy. In 1901, Lohner, having displayed a front-wheel electric drive hub motor car at the Paris World Fair in 1900, went one step further with his development engineer Porsche, obtaining a 5.5-litre Daimler internal combustion engine from the Austro-Daimler company. Porsche installed it in the Lohner chassis at the front, driving a generator that provided electric power directly to the hub motors, bypassing the batteries when required. The creation was called the Lohner-Porsche 'Mixte.' It was indeed a combination of electric and petrol fuel drive systems, today generically known as a hybrid. In amongst these developments, of course, the cars had to be tested, and thus Ferdinand became an accomplished driver. Racing was already a big deal throughout Europe, and in 1900 Lohner had lost no time in building a racing version of the earlier car, Porsche himself establishing a record on a 10 kilometre winding dusty stretch of a route, the Semmering road – better known as the Semmering Bergrennen – where the gradient on the hillclimb was considerable at that time for early motor cars. It was well known as a site where cars and motorcycles would compete to be the fastest. On 23 September 1900, Porsche covered the distance up the Semmering climb at a speed average of 40km/h, considered at the time to be sensational. More development would come in 1901 with the use of larger electric motors. Interest in motor sports also increased in Austria when the Paris-Vienna race was announced as 'the' big race of 1902, a mammoth undertaking both for the organisers and the 43 competitors who took part in what was designated to be that year's Gordon Bennett Trophy race. However, come the day, many Austrians proved to be at worst antagonistic, and at best little interested in what was going on. Lohner chose not to enter the 615-mile event, and the company continued to concentrate on development. By then Panhard & Levassor had bought the licence to produce the car in France, Britain and Italy.

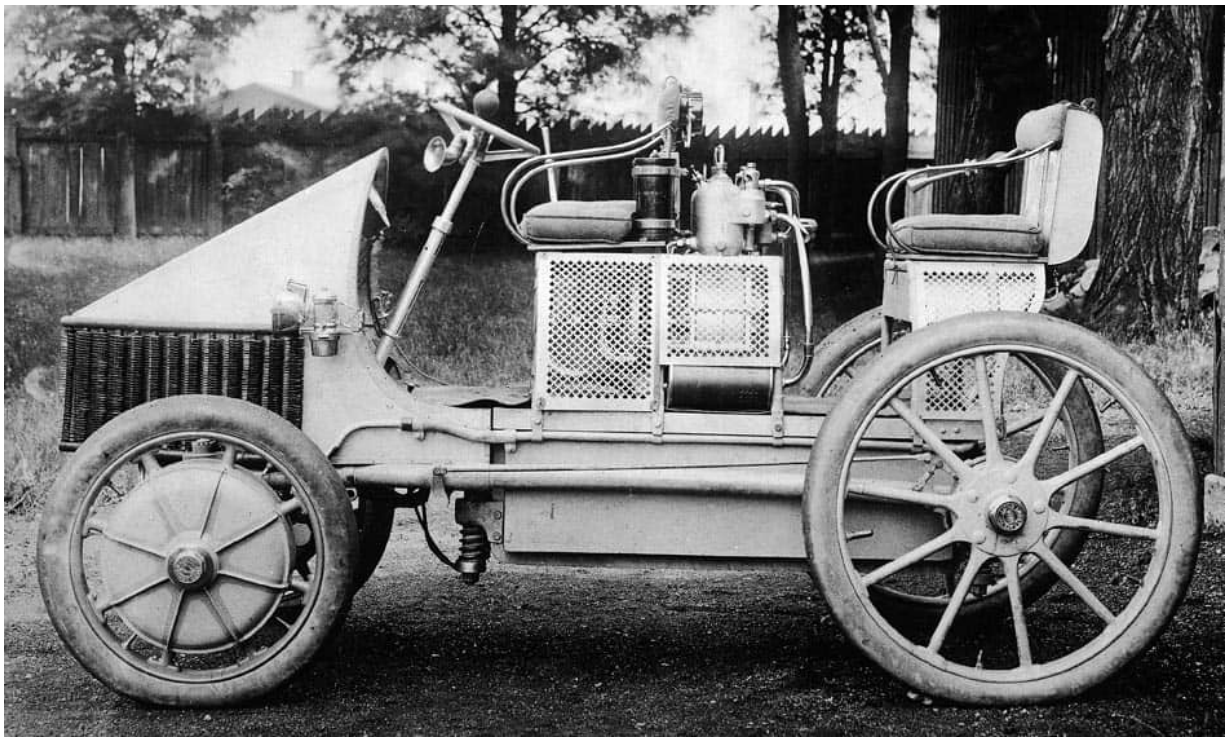


On 23 September 1900, Porsche covered the distance up the Semmering climb at a speed average of 40km/h, considered at the time to be sensational. This was the first Porsche-powered racing car. (P)

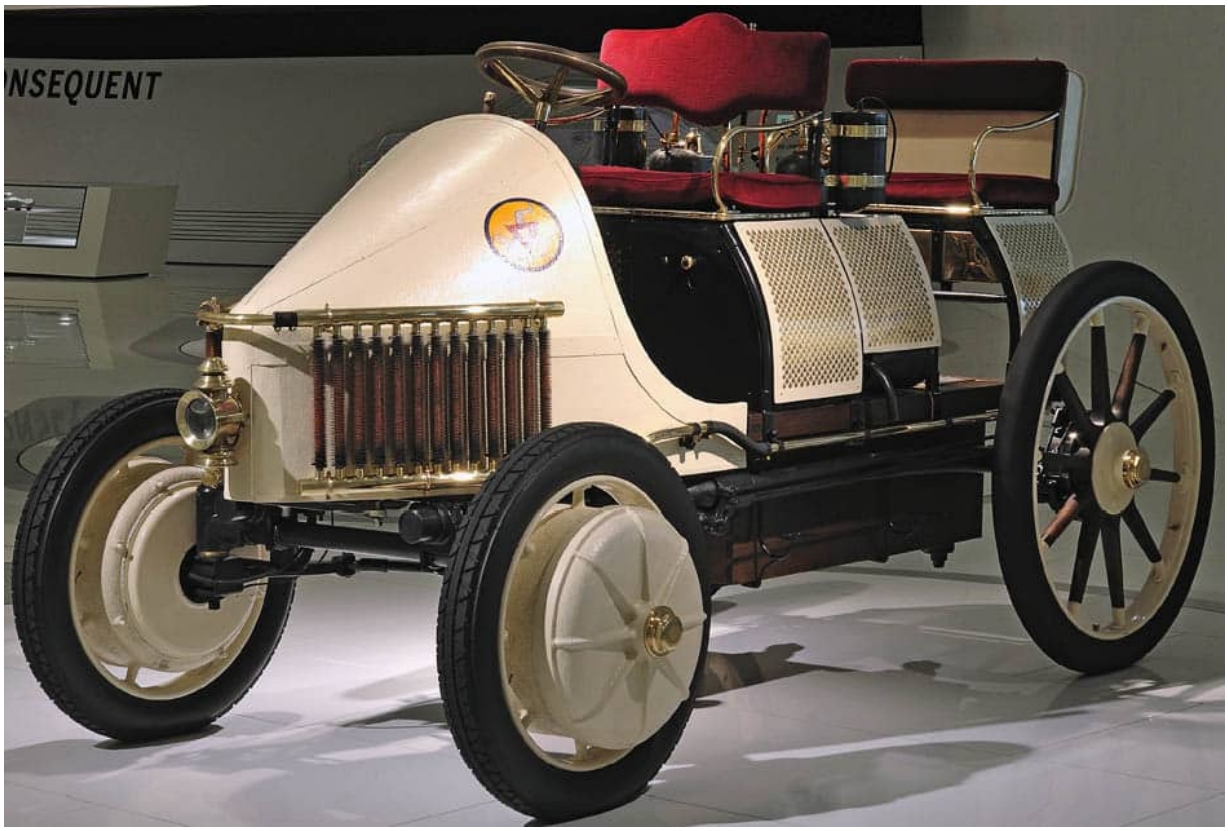
Lohner decided to enter two cars for the 1902 Nice Motoring Week on the French Côte d'Azur, Porsche himself driving one car and the experienced Lorraine Barrow the other. It was not the success they had hoped for: the cars, other than the fact that they appeared to handle well, and we assume would have been quite quiet, were not that quick! A few weeks after the Nice week, in April 1902, came the Exelberg hillclimb. Porsche again took the wheel on the loose-surfaced 2.6-mile course. The Lohner-Porsche Mixte this time won the large car class (up to 1000kg), setting a record for the hill. It was this performance that caught the eye of the military in Austria. Lohner had heard there was interest, so Porsche converted the race car to a four-seater and took the Mixte car to demonstrate it at the military manoeuvres, under the watchful eye of the then emperor, Franz

Josef. So impressed was Franz Josef that he employed the creator, Ferdinand Porsche, to act as his chauffeur in a 'Mixte' road vehicle for that year's tour of inspection of military installations. In spite of this success, significant orders for the 'Mixte' vehicle failed to be forthcoming. Porsche became frustrated: he wanted to expand, develop more, do more racing. His technical dreams were not going to be fulfilled staying at Lohner, and he left to join Austro-Daimler in Wiener-Neustadt in 1906 to become head of engineering and production. Paul Daimler, son of Gottlieb Daimler, was then Chief Engineer.

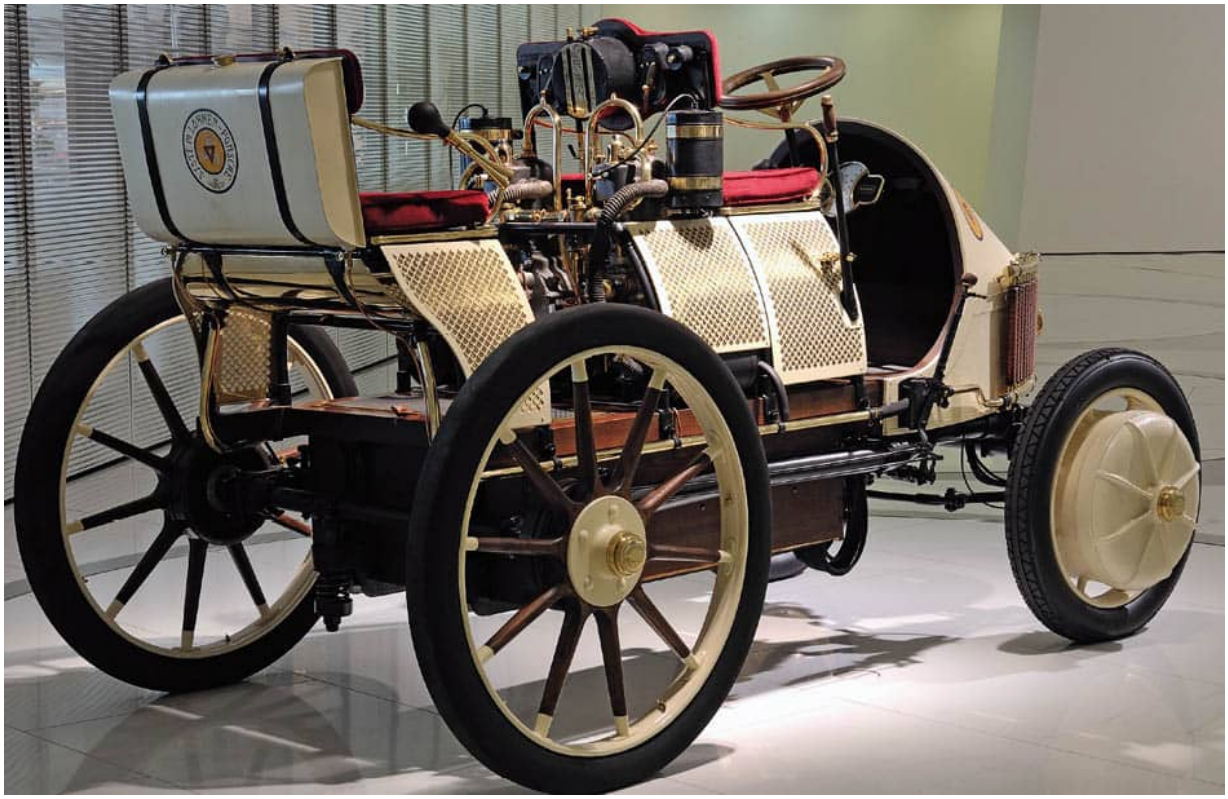
Ferdinand Porsche now began to move on up into what was to be an illustrious career with Austro-Daimler, where his expertise in electric drives and 'Mixte' systems led to some incredible machines for the expanding Austrian military during the First World War. The full story can be read in Karl Ludvigsen's work *Professor Porsche's Wars*. Ferdinand also began to become involved in the design and build of aero engines for Austro-Daimler in 1909, becoming well known internationally (see also Chapter 9). Those engines were mostly of a conventional design, but in 1912 he came up with an idea for an air-cooled, almost flat-four engine, with overhead valves.



The first hybrid ‘Mixte’: two De Dion-Bouton petrol engines provided the generation capability to both drive and brake the front wheels. (P)



The Lohner-Porsche Hybrid, called the Semper Vivus ('Always alive'), recreated by the engineers at Porsche in 2011. Two generators paired with petrol engines formed a single charging unit, simultaneously supplying electricity to wheel-hub motors and batteries. (P)



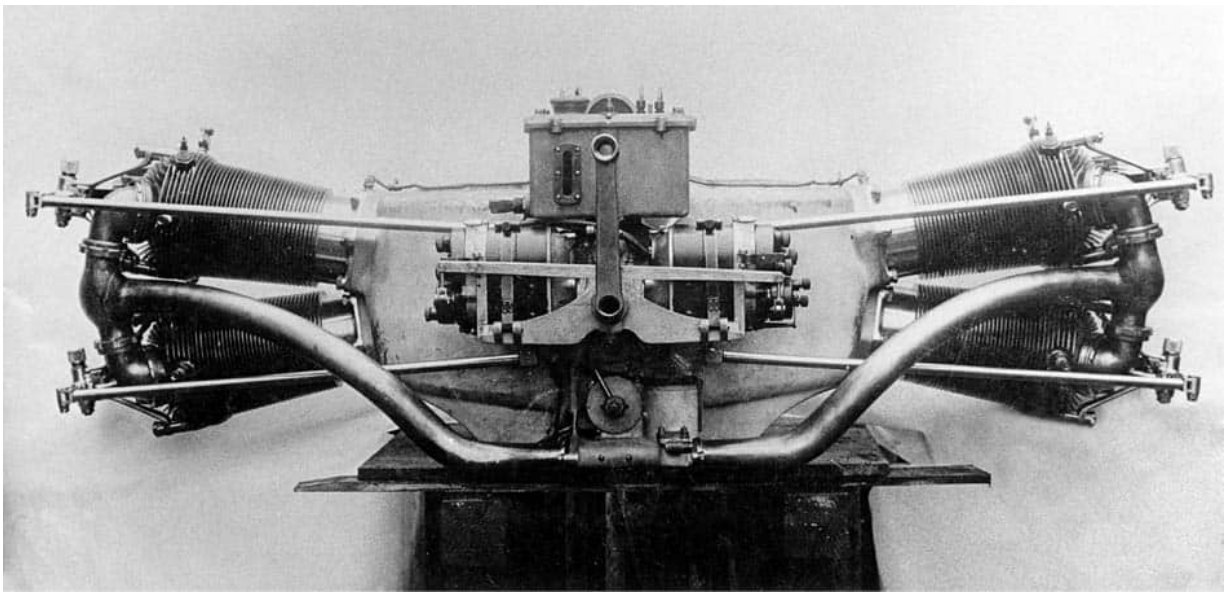
The world's first petrol and electric powered car, hence the type title 'Mixte.' This model type had two water-cooled 3.5PS (2.6kW) De Dion-Bouton petrol engines (another model used a front-mounted Daimler engine) – driving two generators to create electricity – each producing 2.5hp (1.84kW). Both engines operated independently, each delivering 20 amperes with a voltage of 90 volts. The electricity generated by the dynamos initially flowed to the wheel-hub motors, with the surplus power being sent on to the batteries. An added bonus was that it was also possible to use the generators as electric starter motors for the petrol engines by reversing the direction of rotation. (P)

Typical of the man, Ferdinand Porsche decided to try an alternative to water cooling, creating a new type of air-cooled power unit. It was this that led to various rotary aircraft engines, and, by the end of the war, a 300hp V12, along with a W engine that had a hollow crankshaft which enabled a machine gun to be fired through the centre. At the same time, Porsche's creations for military vehicles powered by his electric hub drives became legendary (see the

aforementioned work). Porsche even got involved in an idea for a helicopter! However, at the end of the war, due to the terms of the Armistice, Germany and Austria's military capabilities were dismantled, and with them went many hundreds of ideas, and, indeed, the engines themselves, to the scrap heap. Troubled times lay ahead for the man who, by then, had overall responsibility of the Austro-Daimler Company's affairs. In the years ahead he was to fall out of favour with those charged with the postwar running of the company. The Austro-Hungarian empire, so strong before the war, was decimated. One Camillo Castiglioni, an opportunist entrepreneur with strong banking connections, became involved with Austro-Daimler. With the war lost, the whole region was at breaking point; the General Deposit Bank took control of Austro-Daimler, a bank which had Camillo Castiglioni on its board of directors. Castiglioni had a financial interest in over 80 companies in the period. It is also recorded that he had his fingers on the pulse of Austro-Daimler by 1922, and he laid down conditions that would eventually force Porsche from his position, making life very difficult. The situation was made worse by the death of one of the Austro-Daimler racing drivers at Monza later in the year, amid accusations that it was Porsche's design that had caused a part of the equipment to fail. The board of Austro-Daimler backed Castiglioni and Ferdinand Porsche decided his position was no longer tenable. So Porsche, the man who had become Mr Austro-Daimler to everyone, and had been awarded the Officers' Cross by the Emperor of Austria, the Prussian Order of Merit by the German Emperor, and had been appointed to an Honorary Doctorate by the University of Vienna, left the company. His position was taken over by one Karl Rabe, a man of whom we will hear again later; he had joined Austro-Daimler as an apprentice just before the war. Rabe was now 27 years old, and Porsche, although sad to leave, was happy that his protégé would follow in his footsteps.

Although in this work we are dealing with Porsche-powered racing cars, those in the know will be aware that Porsche-designed power units were employed in many other areas. We already mentioned aircraft, but there were also trucks, tractors, boats, even turbines and

static engines. Some of those ‘other areas’ can be seen in Chapter 9. It is racing cars that we are interested in mostly, and we now turn to the next one to have the Porsche hand on it. Designed and built in the latter days of 1921 and the spring of 1922, while Porsche was still at Austro-Daimler, it was called the Sascha.



1912. Almost a flat-four, with two cylinders each side in a shallow V. One might say this was the birthplace of the VW air-cooled four. (P)

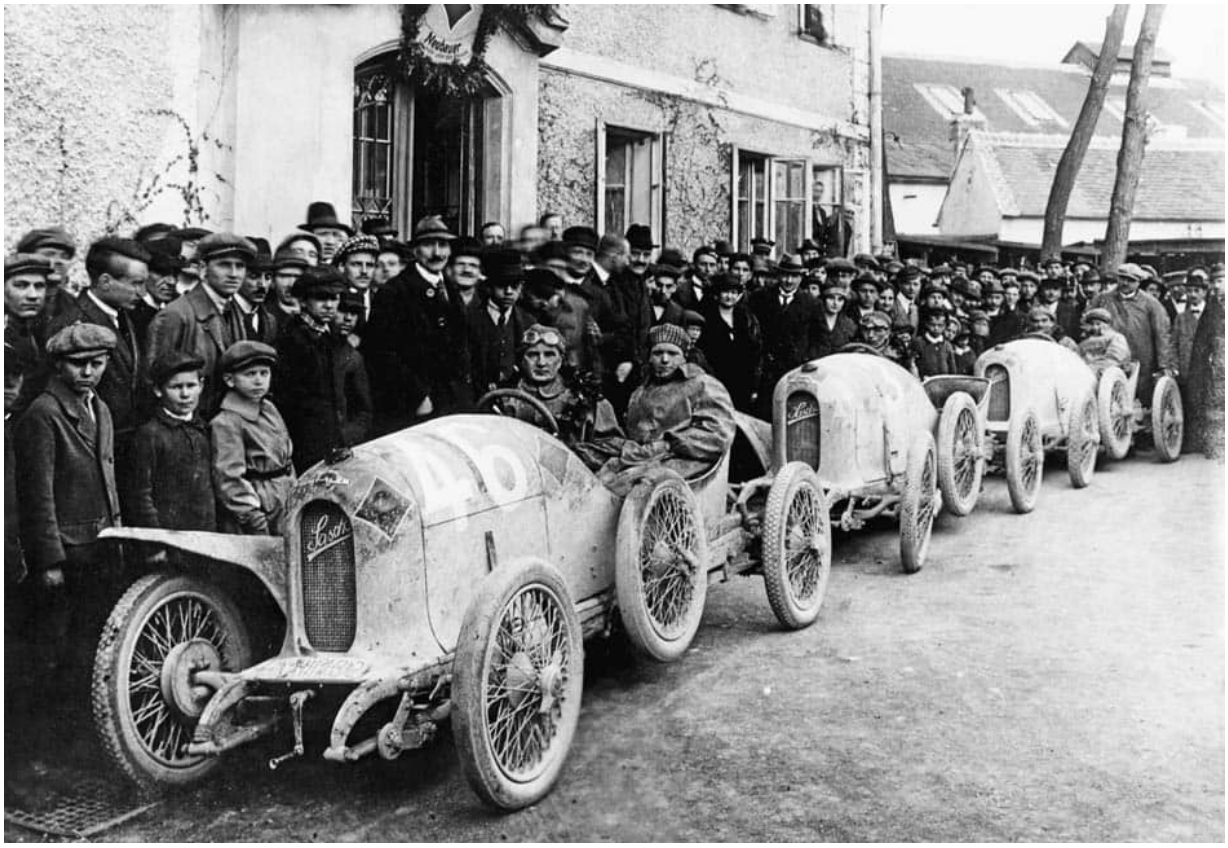
Austro-Daimler-Porsche Sascha

This was Porsche’s first small racing car. At the end of the First World War, due to changes in national boundaries, Austria was reduced in size, and its citizens unable to travel. The Versailles peace arrangements were very restrictive. Porsche, then an Austrian citizen, saw his home in Maffersdorf likely to be confiscated, as the area became part of Czechoslovakia. He needed to travel extensively, and reasoned that unless he changed his citizenship to reflect the new order, he would not be able to do so. He therefore became a Czechoslovak national, which allowed him to move freely between countries, as well as keep his home intact. In 1903, Ferdinand had married Aloisia Johanna Kaes, and a daughter, Louise, had been born in 1904, followed by a son, Ferdinand Anton (usually known as Ferry), in 1909. At the age of 10, young Ferry Porsche became the

proud owner of his own personal transport – not a pedal car, but a car with a real engine and two-seater body: it is said it could do 30mph. Porsche had a passion for small intricate items; his hobbies were also his work, and he often created small, interesting means of transport that he could use around his hunting lodge.

Austro-Daimler built big cars with big engines, but due to his position and esteem within the company he had the opportunity to experiment, and, whilst the board of Austro-Daimler was fixed on large vehicles, Porsche was pushing the point that there was a need for small cars, and the likes of Citroën, Ford, Austin, Tatra, etc, were all looking in that direction.

A fabulous period image of the Sascha, 1922. To the right, with cap and moustache, stands Ferdinand Porsche, with 12-year-old Ferry Porsche standing on his left. (P)



Alfred Neubauer in the front car; second in line is the Sascha of Fritz Kuhn, and third in line is the Lambert Pöcher car. (P)

The Lambert Pöcher Targa Florio car; Porsche standing on the right behind the front wheel. (P)

Against the general wishes of the company, Porsche designed a small racing car to be powered by a four-cylinder inline conventional-type engine, but featuring an overhead camshaft and other Porsche innovations – the camshaft was gear-driven, not chain. It was to be called the Sascha (named after a film producer friend, Sascha Kolowrat), and was a proper racing car. Putting out around 50bhp, it could do nearly 90mph, and it could also be registered as a sports car to drive on the road, simply by adding mudguards! Appearing in the spring of 1922 as a two-seater, the Austro-Daimler Sascha was ready to race – the target: the 1922 Targa Florio, a race that already had a history going back to 1906. By 1922 the race had developed into one of the greatest motor races on the calendar. Porsche would oversee the three Saschas entered. The drivers were Fritz Kuhn, Lambert Pöcher and one other man who was to become legendary in

his own right: Alfred Neubauer, a former officer of the Austro-Hungarian Imperial Army and later Mercedes supremo; in 1922 he was a test driver for Austro-Daimler.

Over four laps of the 108km circuit, the Austro-Daimler Saschas would have their work cut out against formidable opposition: Mercedes, Alfa Romeo, Steyer, Fiat, Italia, Ceirano. Virtually unknown at the start, the Porsche-created Saschas would be world famous by the end. Of the 42 cars that started, only 25 finished. Two of the Saschas had 1.1-litre engines; these competed in the touring/sport up to 1100cc category, and were driven by Kuhn and Pöcher, who came 1st and 2nd, respectively. The third car, driven by Neubauer, was a 1.5-litre, competing in the large racing car class against the monsters, finished 5th overall in the racing car category. A fourth, privately-entered Sascha sponsored by Sascha Kolowrat, retired. On paper, the overall result looked impressive, and indeed it was (though it has to be mentioned that the entry list for the single-seat class of racing cars stood at seven, and the up-to-1100cc was just the three Saschas). Still, results are results, and it was no mean feat to complete the course, let alone take a class victory on the first racing outing.

The designer, Ferdinand Porsche, was celebrated throughout the sporting media. Austro-Daimler had already been successful in previous years, especially 1920 where, in 51 events, Austro-Daimlers had won 43 times, and come 2nd eight times, though these were all with large-engine models.

Whilst Porsche was the man behind the racing, the rest of the board was not so enthusiastic, seeing racing now as a very expensive incursion into its finances. Worse was to come when Fritz Kuhn was killed at Monza during practice for the 1922 Italian Grand Prix. Pressure on Ferdinand Porsche became intense, and was contributory to his leaving Austro-Daimler. The Sascha faded from the scene.

♦ ♦ ♦ ♦ ♦

Leaving Austro-Daimler in late 1922, by spring of 1923, Porsche had

joined the German Daimler company in Stuttgart, which eventually merged to become Daimler-Benz. Ferdinand's abrasive and sometimes caustic personality did not endear him to everyone. Clearly a man who did not suffer fools gladly, he was treated with the utmost respect due to his innate ability to understand a problem almost before it arose, and when it did, he had a solution. His time at Daimler Stuttgart would not be altogether happy, but he won more respect after his work on overseeing what had been the difficult birth of a new racing car, originally intended for the Indianapolis 500 of 1923: the 2-litre supercharged Mercedes-type Indy, test-driving it himself as each improvement was made. Three Mercedes-type Indy cars went to the 15th Targa Florio/Coppa Florio in 1924, again four laps of the famous circuit. The winner would be Christian Werner in a Mercedes-type Indy. A second Mercedes-type Indy in the hands of Christian Lautenschlager, the third of Alfred Neubauer, at the start of his illustrious Mercedes career, sealed a 1,2,3 victory in the 1501 to 2-litre class. Porsche once more enhanced his status, fast becoming legendary. A report says: "The Targa Florio was run over four laps, while the Coppa Florio required the competitors to complete an extra tour of the circuit, a total of 540 kilometres. In a supercharged Mercedes Christian Werner won the Targa Florio on 27 April 1924 in a time of 6:32:37 hours, also winning the Coppa Florio in a time of 8:17:1.4 hours and also drove the fastest lap in 1:35 hours. Positions 2 and 3 in the same racing class were likewise occupied by Mercedes with drivers Christian Lautenschlager and Alfred Neubauer. This meant nothing less than a triple victory for Daimler-Motoren-Gesellschaft (DMG)."

Neubauer in the Indy Mercedes, with Ferdinand Porsche (right). (P)

Ferdinand Porsche became technical director at Daimler and was awarded another Honorary Doctorate in 1924 by the Technical Academy of Stuttgart with the citation: “In recognition of outstanding merit in the field of motor car construction and particularly as designer of the winning car in the 1924 Targa Florio.” Dr Ing hc F Porsche became the title that has remained famous to this day. Porsche went on to influence developments of many racing Mercedes-Benz cars throughout the latter part of the 1920s, including the glorious SS models, victorious in the hands of great drivers like Rudolf Caracciola, Hans Stuck (Snr) and Manfred von Brauchitsch. Porsche wanted to create a small car for Mercedes-Benz, as it was to become known after the merger of the Daimler and Benz companies in 1926. The board wasn’t keen, though Porsche did manage to get 30 test cars built in the spring of 1928. It is said that they had the look of the future Volkswagens; unfortunately none

survive. Once more his thoughts turned to racing cars. In 1922 he had met with one Dr Edmund Rumpler, an Austrian aero engineer who had designed and built a car named the Tropfenwagen. Rumpler was to go to the Benz Company with his ideas for a mid-engine racing car. Maybe here was the point when Dr Ferdinand had a eureka moment. Rumpler was ahead of his time and had gone to Benz in Mannheim to enlist its help with development. Daimler, of course, already had connections with Benz. It is also likely that when Ferdinand Porsche became technical director and a member of the board of Daimler-Motoren-Gesellschaft, he would have seen the Tropfenwagen. (The Tropfenwagen is worth a story in itself, but not here. If readers would like to know more, I would refer them to Karl Ludvigsen's works about the history of Mercedes-Benz, and, indeed, the already mentioned and equally enlightening story *Professor Porsche's Wars*.)

Almost a sports car: by 1922/23 the mid-engined Rumpler Tropfenwagen was racing, seen here at the European Grand Prix at Monza, 9 September 1923. Rumpler's car, now known as a Benz, carried a riding mechanic! Three Benz Tropfenwagens were racing; this one, driven by Ferdinando Minoia, would come home 4th overall. A second, driven by Franz Horner, would finish but not classify, whilst the third, driven by Willy Walb, did not finish. (M)

The idea of an engine in the back of the car was not featured in any of Porsche's creations at that time. In fact, everyone in the motor industry was going with front-engine designs. Porsche, though, had been asked by a wealthy private individual to design a racing car, and it was in 1926 that Porsche first sketched out a car similar to the Tropfenwagen. But there the project stopped, as the austerity of the late 1920s affected his now not-so-wealthy sponsor. Meanwhile at Benz, Porsche, doing his own thing again, had designed a 3-litre eight-cylinder supercharged racing engine with twin overhead camshafts. It is said too that he had designed the body and the chassis, with swing axle suspension and the differential within the gearbox at the back of the car. Once more a revolution in thinking

was about to take place. However, these activities did not go down well with the board. Porsche was never one to compromise; inevitably there was a breakdown in relations, and after 5½ years at the Daimler then Daimler-Benz company Porsche decided to move on. In 1928, he left to join the Austrian company Steyr-Werke AG as chief engineer and a member of the board. However, he was to stay there only for a short period. A merger took place between Austro-Daimler, his old company from the early days, and Steyr Puch. It was now a case of too much top management and, with the world going deeper into depression, he was asked to relinquish his highly paid job quite soon after joining. At this point in his life he was already considering forming his own independent design company, and he chose Stuttgart as the most likely location to provide the work he was seeking. He went looking for talented engineers to join him. An approach to Karl Rabe at Austro-Daimler saw his former protégé say yes. The establishment named 'Dr Ing hc F Porsche GmbH, Design and Consulting Services for Engines and Vehicles' was born, officially inaugurated in Stuttgart on 25 April 1931. Ferdinand's son 'Ferry' (christened Ferdinand Anton), then 22 years old, also joined him as one of the first employees.

On 31 October 1931, Erwin Komenda, previously at Steyr, but who had moved to Daimler-Benz, decided on a leap of faith to join the fledgling company. Porsche also took on one Adolf Rosenberger as commercial manager. Rosenberger was not only a commercial man, but a passionate motorsport enthusiast, and had driven the aforementioned Tropfenwagen in the 1920s. He had raced Mercedes cars in the latter part of the '20s very successfully, and so was a perfect like-minded soul to join this new company that was bulging with talent.

In fact, the talent showed early on. By August 1931, Porsche Design had filed its first patents for a torsion bar suspension system, a development that would go on to influence generations of automobiles to come. Rosenberger, however, had a bit of a tough time with the boss, though it is said they parted on good terms when Rosenberger moved into a commercial position with the newly formed Auto Union company. Porsche was to attract other key personnel in

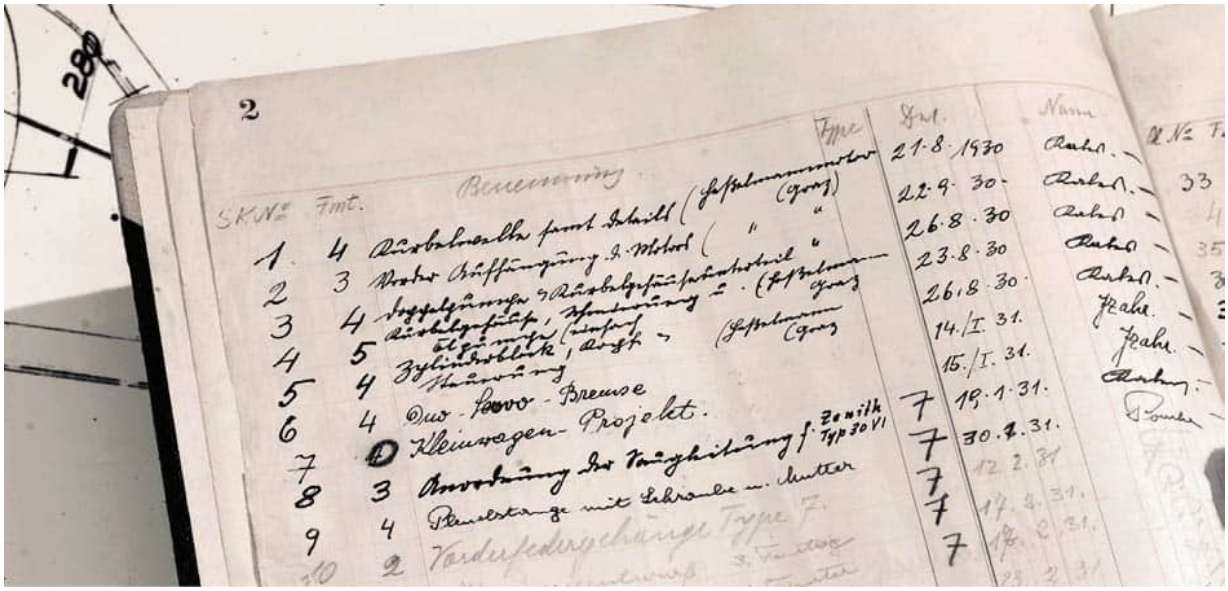
1931 and along with his son Ferry, Karl Rabe, and Erwin Komenda, came others who would become doyens of the Porsche company: Franz Reimspiess, Josef Mickl, Karl Fröhlich, Josef Zahradnik, and Josef Kales. The company set about getting design contracts. At first any work was sought, including a project for Zündapp, where the engine was placed in the back of the car in question and was to lead to ideas a few years later for NSU and then Volkswagen. Porsche had in mind a flat-four-cylinder air-cooled engine. Zündapp, though, was better known for motorcycles, and an upsurge in the demand for these led to the car project being shelved.

Dr Ing hc Ferdinand Porsche and son Ferry – a famous picture taken in 1934. (P)

Since the First World War, Porsche had seen great changes in the world order; these political and national changes would affect what was also a period of great division within the motor industry. Arising out of the many mergers was the establishment of the aforementioned Auto Union Company, created in 1932 by the amalgamation of Horch, Audi, Wanderer and DKW. Auto Union became a client of Porsche Design and in 1933 Auto Union's management employed the Porsche Design Bureau to take responsibility for monitoring, developing and coordinating the activities of its designers for a new racing car project. It was headed up by Dr Ferdinand's son, Ferry. There is an interesting little story as to how the new racing car project came about. It seems that in 1925 the famous racing driver Hans Stuck (Snr) met up with an old friend who had invited him out for a day's shooting. During that day, Stuck was introduced to one Adolf Hitler. Daimler-Benz had stopped racing, but Stuck wanted to continue, and it seems he told Hitler about it. Many years later (exact date uncertain), when Adolf Hitler was already setting his sights on becoming President (Chancellor) of the German nation, he remembered the earlier meeting with Stuck and what he had said, and gave Stuck a call. Hitler told Stuck he wanted to bring motor racing back to life in Germany for propaganda purposes; Stuck pricked up his ears. As history records, in January 1933 Adolf Hitler became the new German Chancellor in a somewhat dubious election. The Third Reich was born, and at the February Berlin Motor Show it was announced that 500,000 Reichmarks would be made available to the manufacturer who could build an all-German racing car to the then-new 540kg formula – a Grand Prix car. Stuck was asked to make a list of requirements for a suitable car. Having been closely involved with Daimler-Benz during the period when Ferdinand Porsche was in residence, he knew that Porsche had opened up his new design company, and made contact. The two put their heads together and called on Baron Klaus von Oertzen, managing director of the Auto Union Company. Ferdinand Porsche brought out the design for a mid-engine racing car that he had been involved with privately for an unnamed wealthy and enthusiastic amateur driver back in 1926. Also, as it happened, Ferdinand Porsche himself had been acquainted with

Hitler at the time of the German Grand Prix held at the Avus Ring the same year (1926), when Mercedes-Benz had taken victory. The meeting was brief, but, as a fan of motorsport, it was Hitler that sought out his Austrian compatriot who had been so influential in the Austrian motor industry when Hitler was a young man.

The original workbooks and records of Dr Ing hc F Porsche GmbH, Design and Consulting Services for Engines and Vehicles. (P)



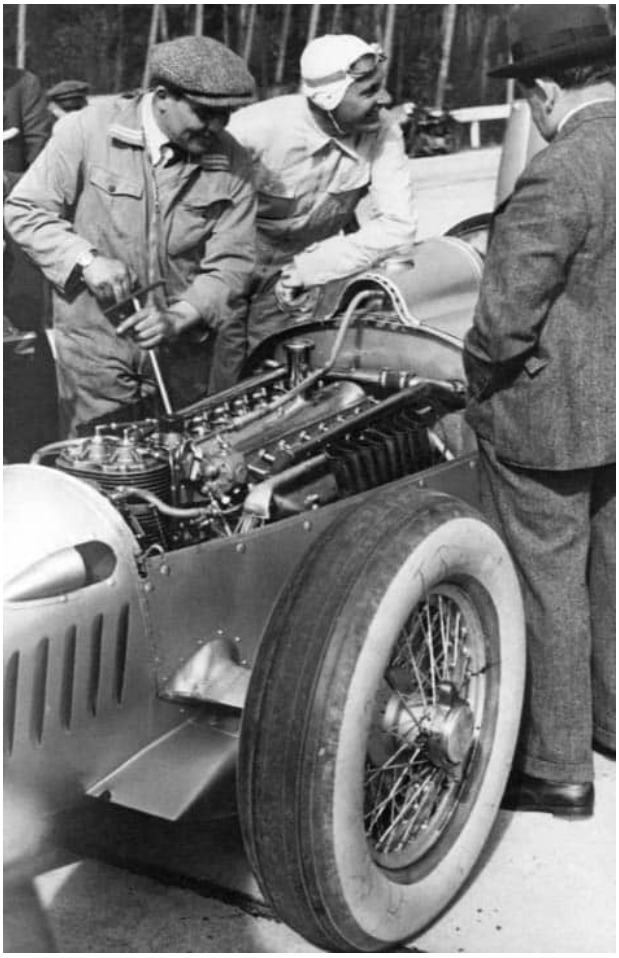
From the drawing and project records; note item 7: Kleinwagen Projekt (small car project), dated 15 January 1931. (P)

Now, in 1933, Porsche saw the chance that the well-funded Third Reich might be able to put some business his way. With the Porsche design office having Auto Union amongst its clients, Dr Ferdinand now offered his design idea to Hitler. The Daimler-Benz company had hoped to get a sole contract for the new racing car with its Mercedes marque, but it is said that Ferdinand Porsche persuaded Hitler at a meeting in May 1933, with von Oertzen and Stuck present, that two German teams would bring even greater publicity/propaganda. Hitler, who saw Porsche as an Austrian 'hero,' agreed. It was decided: Auto Union would build the Porsche-designed mid-engine racing car.

They would build it at the Horch works in Zwickau, where Auto Union's business manager was Adolf Rosenberger, recently departed from Porsche Design. Porsche's so-called P-Wagen had found a home! It became the Auto Union Type A. Rosenberger was, however, from a Jewish family, and did not see the project come to fruition, choosing to leave Germany soon after Hitler rose to be Chancellor.

The mid-engine concept in a race car was here to stay and entered a new phase of development. Of course, as is well known, from 1934 through to the last-ever race for that era of Grand Prix cars – the Yugoslavian Grand Prix – the Auto Unions were the main competitors

to Mercedes-Benz and the Alfa Romeos. The last race of the period was held on a fateful date, 3 September 1939, remembered for the official commencement of World War II. Adolf Hitler's Third Reich had wasted no time in developing its aims during the 1930s, which included many new ministries, among them the Reichsverband der Automobilindustrie (the German Reich Automobile Industry Association). As well as the Auto Union work, Porsche, meanwhile, had continued to seek contracts for car and component design, and in 1933 the NSU Vereinigte Fahrzeugwerke AG had visited Porsche with an idea to create a small 'working man's' car. Porsche Design was given a free hand, and what came out was the all-new Porsche Type 32.



1934: Ferdinand Porsche (right) and Hans Stuck watch while the Porsche engine in the Auto Union car is prepared for the Schauinsland Hillclimb. (P)

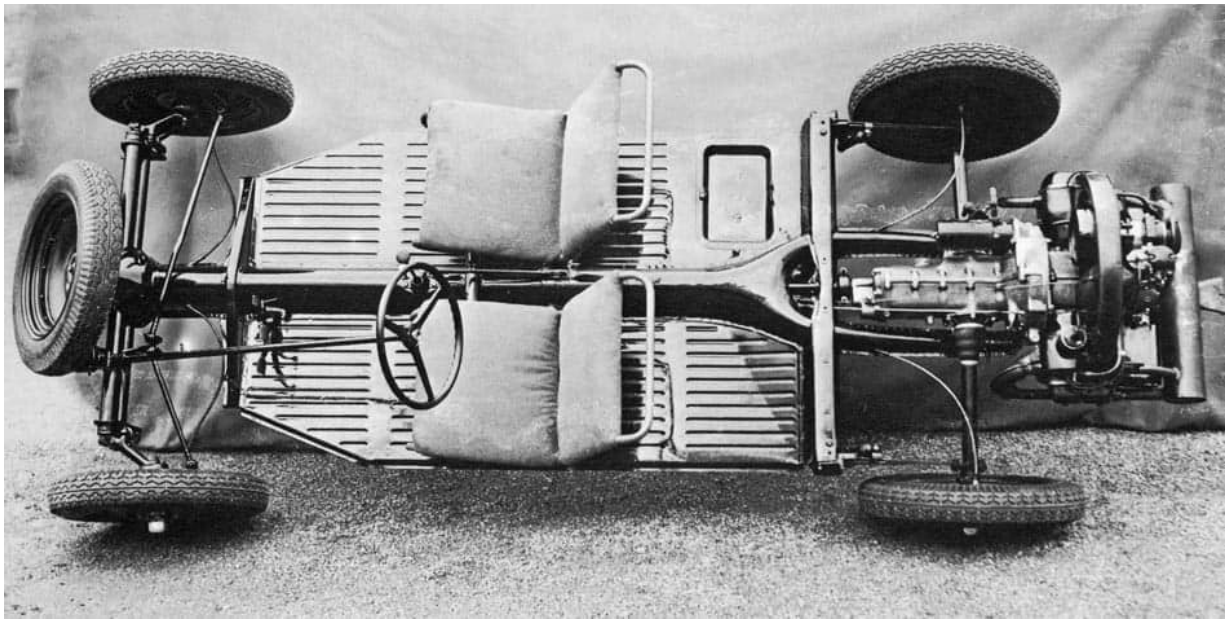
The design, a platform chassis mounted on a central tube, featured torsion bar suspension with trailing arms and swing axle at the rear. But most recognisable was the body shape, for here we see the ideas of the car that would also become an icon. This design was presented to NSU on 10 November 1933. Two prototypes in wood and steel were built by the Heilbronn-based Drauz company. From these two came a third prototype with an all-steel body, made by Reutter, based, like Porsche, in Stuttgart. Developments continued, though NSU lacked enthusiasm. Via a mutual acquaintance, Jakob Werlin, Ferdinand Porsche came into contact with Hitler again, when the new State organisation, the Reichsverband der

Automobilindustrie, was created. The Reichsverband der Automobilindustrie signed a contract with Dr Porsche's design company in 1934 to develop a small car – a people's car. With the contract in hand, the latent NSU project became what was to be the first Volkswagen. Porsche pressed on, and in 1936-37, after a lot of minor adjustments and extensive testing, the famous shape that we know today was ready for the market.

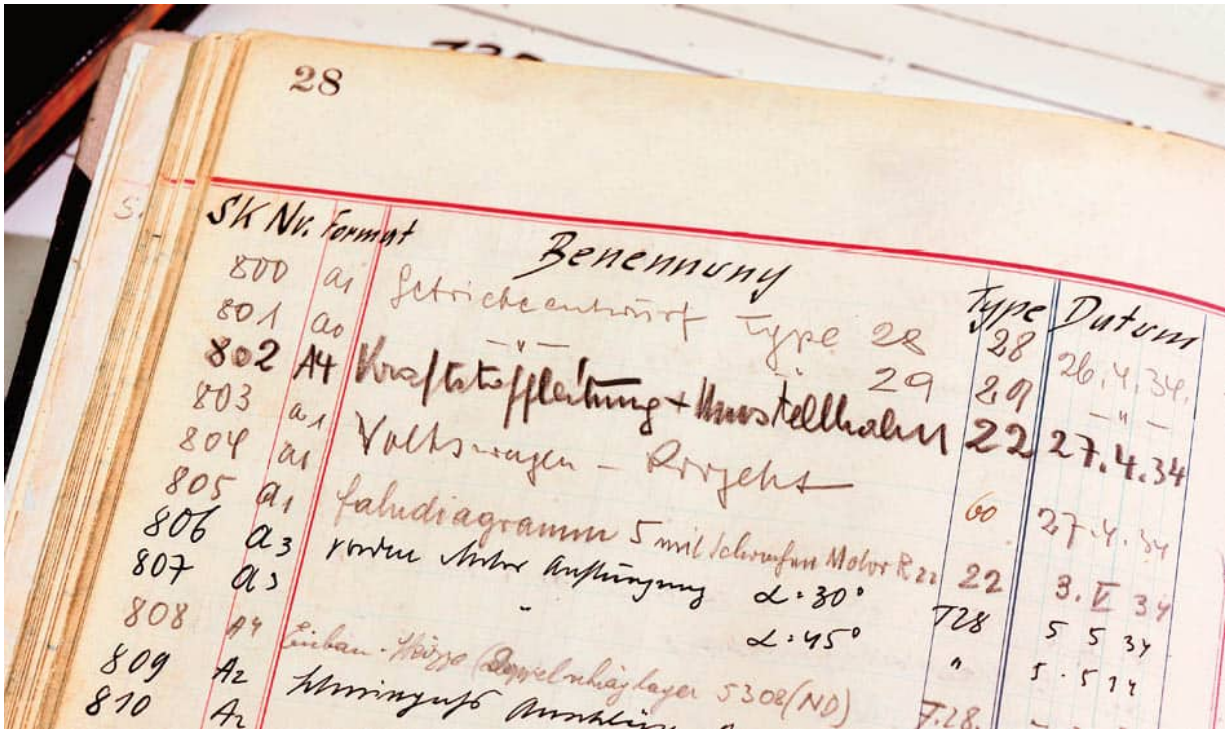
Since its inception in 1931, the Porsche Design Bureau had been extremely successful and profitable: so much so that it was decided to set up a new establishment, not only to design, but also to build and test vehicles. The site chosen was in Zuffenhausen, to the north of the centre of Stuttgart; the date: June 1938. Under the guidance of Porsche a new engine was designed by employee Franz Reimspiess. It was a flat, 'boxer' 4-cylinder air-cooled unit: the engine that would go into the millions of VWs that came after. Interestingly, one project that had to be shelved when the Third Reich propagated World War II was an exhaust-driven turbocharger for the VW air-cooled engine. As the reader may know, the turbo would not arrive at Porsche until 1964 in the 911 model. Superchargers were also tried, as Ferry Porsche recalled in an interview given to *Porsche Panorama* magazine in 1979: "We already had considerable experience with performance engines. During the war, I (more or less secretly) drove my VW cabriolet with an engine producing 50hp thanks to the use of a Rootes supercharger. Also, as early as 1950, the year production actually began in Stuttgart, Dr Ernst Fuhrmann began designing a high-performance engine with two camshafts on each cylinder bank. It was intended for racing at first – we only put it into production five years later."

Dr Ferdinand Porsche surveys his design company's new creation, the Auto Union mid-engined racing car. (P)

The V16 Porsche engine powers the new Auto Union. This one is the Type C Auto Union (Porsche Type 22). Mid-engine, 16 cylinders, V format at 45˚, 6-litre. The first units produced 295hp from 4.4-litre. It was first driven in 1934 by Willy Walb, who had also been involved with the Tropfenwagen when at Mercedes. (P)



The beginnings of the Porsche Type 32: a platform chassis mounted on a central tube featured torsion bar suspension. (P)



Page 28 of the drawing and project records of Dr Porsche's design bureau: item number 803, project number 60, Volkswagen, date 27 April 1934. (P)

The Porsche Design part of the company in Stuttgart, with Ferry Porsche at its head, had been hastily moved to a secret location; it had chosen a wood yard near Gmund in Austria in 1944 to escape the infernos caused by Allied bombing, whilst the father of the organisation, Dr Ferdinand, remained in Stuttgart. In fact, the site in Gmund was to remain a secret to the Allies until they discovered it in 1945 at the end of the war, when British officers on the ground arrived to find what was locally known as The Associated Iron and Steel Foundry – a collection of nondescript wooden buildings hiding quietly near the little village. One of the first postwar Porsche employees, Herbert Linge, recalls how it was for him at that time in Stuttgart. “I first started at Porsche, training to be a mechanic, in 1943 in Zuffenhausen, during the war. But at that time I was not making anything serious; it was a school, an apprenticeship. When I left normal school, I was not good enough to go straight to engineering college, so I had to do two years’ Ausbildung (training) to be ready for the next stage; normally I was supposed to finish in 1945.

“It was very strange sometimes: the old doctor would come through the workshop with all these black-uniformed SS men and some Nazi dignitary or other, and whilst they were hustling him along to be quick, he would take his time and come and shake hands with every employee – me too – and ask us how and what we were doing. It was very funny: he would delay and delay these ‘big’ guys, and they got very impatient! Porsche as a company was even then a very ‘social’ place to work, but when the war ended before I had finished my training, the plan to take my exams never worked out because of the war and its aftermath. During ’45 and ’46 many people came back from the war, and it became a case of too many people and not enough jobs. Sometimes, because of these newcomers, there was only work for a short period at a time. We guys, about 20 of us in Stuttgart, were put to work for the American army, repairing jeeps. For the Porsche family the end of the war brought an unwelcome problem. Dr Ferdinand and his son-in-law Dr Anton Piëch were arrested in Baden-Baden by the French authorities in December 1945, when they went there to discuss the design of a new car. They

faced serious financial problems when they were asked to pay a huge bail fee to get Dr Ferdinand out of prison.”

Testing the prototypes in the Alps in September 1936. (P)


Dr. ing. h. c. F. Porsche K. G., Stuttgart-Zuffenhausen

Betriebs-Ausweis Nr. 745

Herr
Frau Herbert Linge
Frl.

ist bei uns angestellt als:

Maschinenbau-Lehrling

Dieser Ausweis ist nicht übertragbar, aufgefordert zu zeigen und wenn ungültig, uns unaufgefordert zurückzugeben.

Austellungstag: 7. Apr. 1943

Dr. ing. h. c. F. Porsche K. G.

401 - 2. 1950 - 500 - A 6 - Knöller

The Ausweis (Pass) of the young Herbert Linge in April 1943. (P)

It has to be remembered that, during the war, Porsche had been part of the manufacturing effort of the Third Reich and its requirement for military vehicles. This alone would have made the company and its directors a target following the cessation of hostilities. Feelings against anything and anyone associated with Germany were running high, as the so-called Marshall plan for the rebuilding of Western Europe got under way. It was then some months since the war had ended. Ferry Porsche, at the Porsche family home in Zell-am-See, 75 miles north west of Gmund, had also been arrested, though held for a shorter time and released in July 1946.

At that time, Porsche in Gmund was busy; Karl Rabe took over the running of affairs, repairing cars, trucks and generally doing any engineering work that could make money. Only Ferry and a couple of colleagues were looking to the future. Herbert Linge says: “I was eventually able to rejoin Porsche in 1949. They were already very

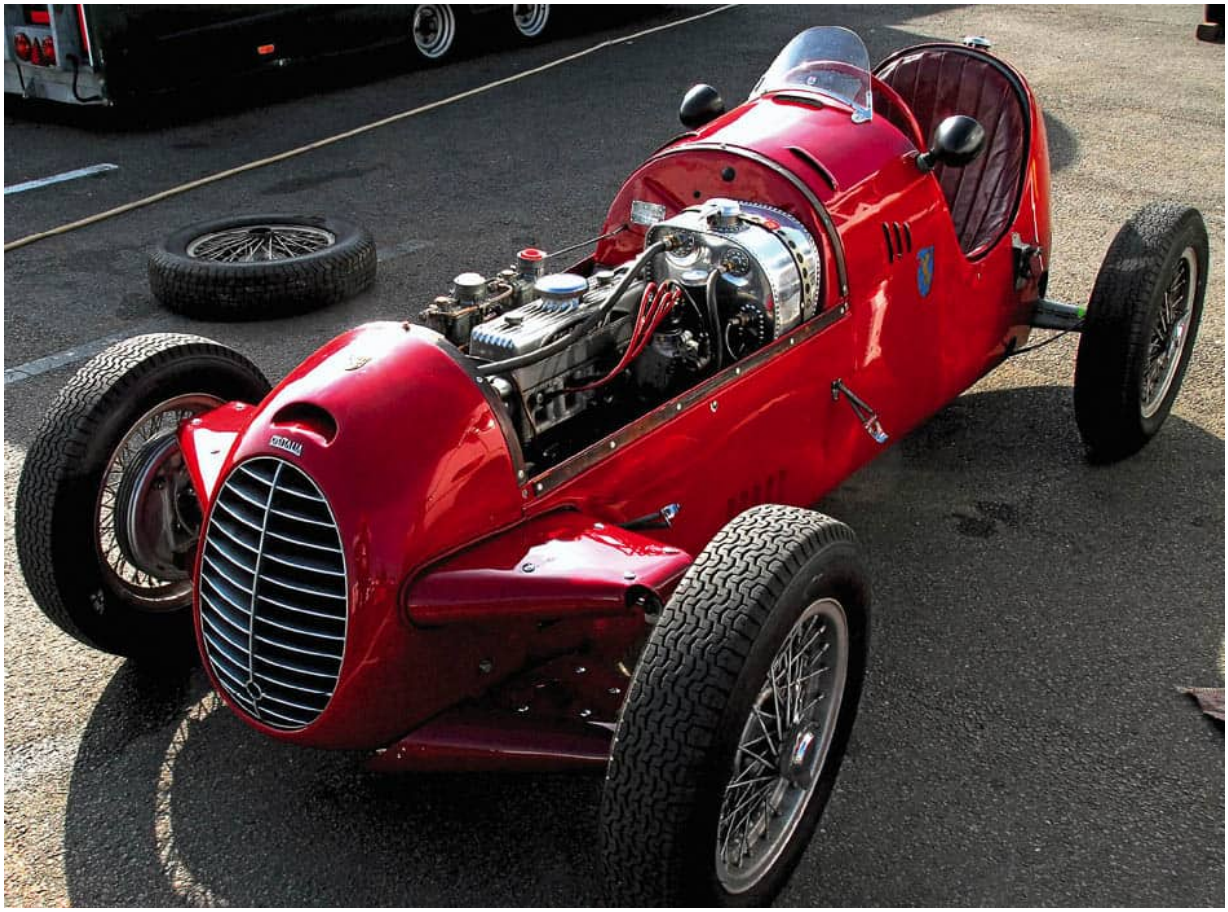
close to the Reutter body manufacturing company in Stuttgart, and there I was sent to work with Erwin Komenda." Herbert Linge again: "It was a small office and workshop; we had no tools, just a small place to start work, nothing else. I had to bring my own tools from home. I had acquired a small motorbike, and used to ride that in to Stuttgart. At the Reutter works we started to design and make the foot pedals for a new Porsche: the first new car, foreseen then as what we now call a mid-engine design." Meanwhile, several hundred kilometres away in Gmund, a new commission had come along, which at the time was completely unknown to Herbert Linge.

♦ ♦ ♦ ♦ ♦

Cisitalia – Porsche

Finances were extremely tight for everyone directly after the war. The Porsche family was in desperate straits, when a fairy godmother came its way, but with mixed blessings. The Porsche Design office had received a request to build a racing car; eventually identified as the Type 360, it was for a gentleman by the name of Piero Dusio, who had funded and founded the Cisitalia Company in Italy. The design work would provide the financial input to help the cash-strapped Porsche Design Company make the progress it needed, and distance itself from utility vehicles in favour of car development. Karl Rabe and Erwin Komenda got to work. It was now 1947, and with huge efforts Porsche was recovering.

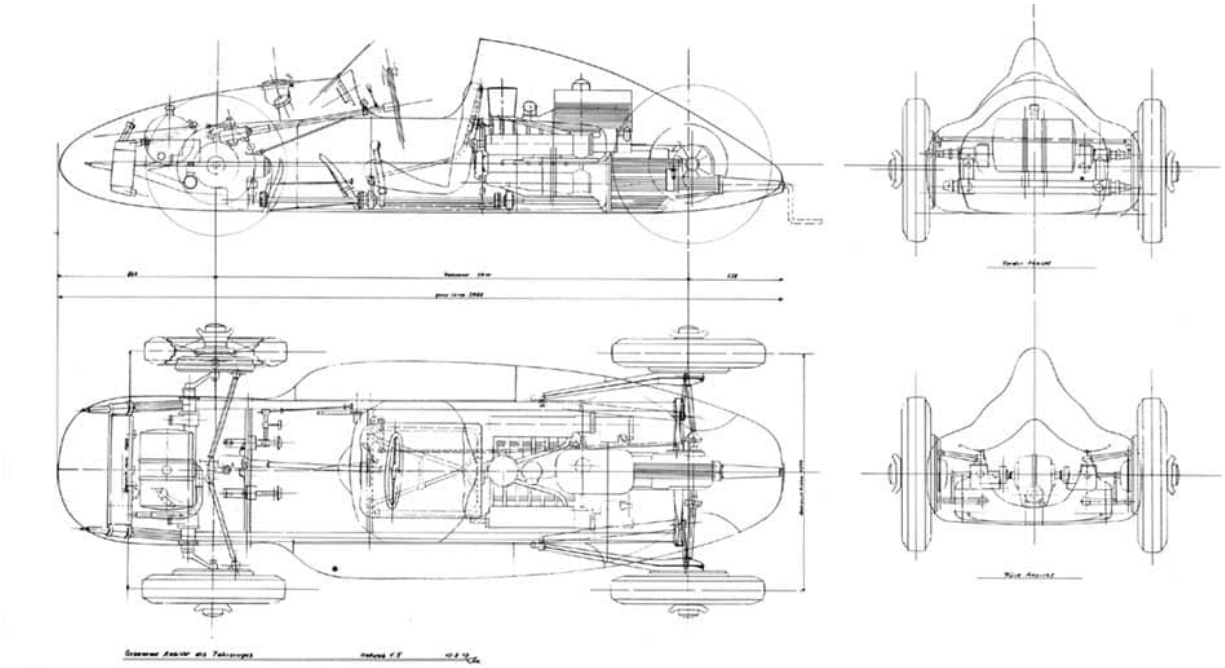
The Cisitalia D46 1100cc single seater, typical of the type first driven by Nuvolari in 1946. (RS)



Neat, compact, beautifully put together: the D46, seen at Silverstone a few years ago. (RS)

This new work had all come about thanks to a certain Karl Abarth, already known at Porsche due to his earlier marriage to the secretary of Anton Piëch, husband of Louise Porsche. Abarth was also a well-known Austrian motor racing personality in the 1930s. Abarth and Piëch both knew one Rudolf Hruska, a design engineer whom Karl Rabe had brought into Porsche in Stuttgart. Hruska became involved with many wartime projects, but, after the war in 1946, had become stuck in Italy when he was refused re-entry into Austria following a trip. He decided to stay with friends, who, by chance, knew the now-named Carlo Abarth, also living in Italy at the time. Abarth was also desperate for work, postwar, and made contact with as many people as he could. One who received an approach from Abarth was the great racing driver Tazio Nuvolari. (There's a nice little story about this

in Karl Ludvigsen's book *Excellence was Expected*: he says Abarth sent a postcard looking for work. It was addressed simply 'Tazio Nuvolari, Mantova.') Nuvolari responded: he wanted to get a new racing car built. Abarth, Hruska and Nuvolari contacted Ferry Porsche in Gmund. Porsche jumped at the chance to do a design: the fees would be useful. The problem was that the 'Italian trio' had no money. Nuvolari, however, had connections, one of whom was racing driver Count Giovanni Lurani who, along with Nuvolari, had driven a little car made by rapidly rising postwar company Cisitalia, owned by Piero Dusio.



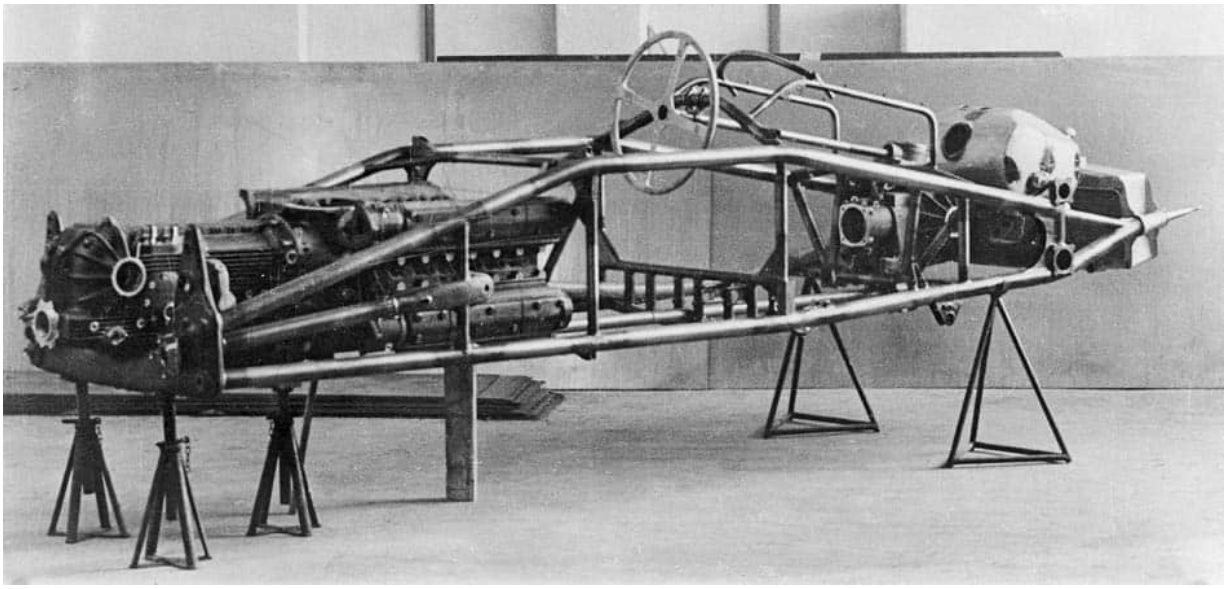
The detailed drawing of the type 360. (P)

Dusio had built a Cisitalia sports car in 1939, but the war intervened, and he became involved in various deals and adventures. A lot of money was made, and after the war he set up workshops in the Corso Peschiera in Turin. His early efforts were quite spritely, and the single-seater race cars consisted of a space frame with independent front suspension. Nuvolari drove one of the first Cisitalias at a race meeting in Turin in 1946, leading the race until a mechanical problem with the steering caused it to retire (but the cars did make

great little racers, several of which are still around today), and famous Italian racing driver Piero Taruffi won the 1947 Italian National Championship with a Cisitalia. Dusio, however, had bigger dreams, one of them being a top Grand Prix team. Lurani and Nuvolari both knew Piero Taruffi, and they all knew of the dreams of Dusio. So Lurani suggested to Dusio that he might be interested in the design idea of Abarth, Hruska and Nuvolari. A meeting was held between those involved at Porsche with Dusio, who also wanted to be involved in other industrial projects and cars (Ferdinand was still incarcerated at that time by the French). Discussions included a type of tractor, a sports car and the racing car. A contract was signed on 2 February 1947.

For Porsche this was a breakthrough; the fee was significant, and with help from racing friends in France one million francs was paid to the French authorities to obtain the release of Anton Piëch and Ferdinand Porsche, who was eventually released in poor health on 1 August 1947. Dr Ferdinand and Dr Anton Piëch eventually returned to their company. The Dusio project, the Porsche Type 360 Grand Prix car, was to be powered by a 1.5-litre Porsche-designed flat 12. Work on the Cisitalia F1 project began under the direction of Ferry Porsche, aided by Karl Rabe and Eberan von Eberhorst, the latter of whom went to Turin to help the Cisitalia company build the car.

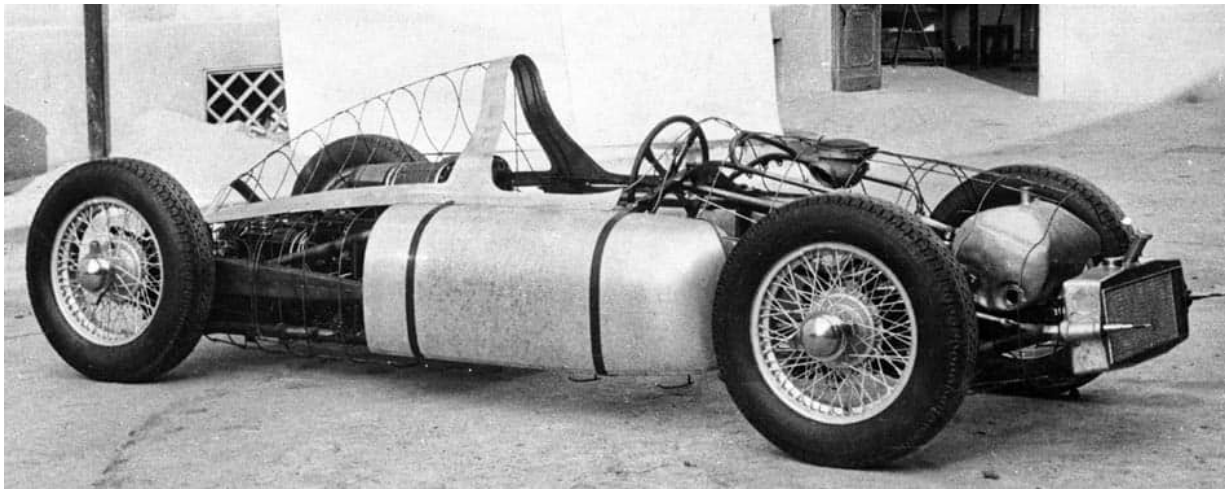
A 1.5-litre engine would be the motive power, and was located in a mid-ship position, behind the driver, for the installation layout. Its two fuel tanks, holding a total of 184 litres, would be placed in a pannier position, and the filler was located just ahead of the driver's windscreen. Overall length was just 3.9m, the width 1.6m, and the height was 1.1m. The chassis consisted of welded tubes of molybdenum alloy, the front axle being from the Volkswagen/future 356. Steering was by a recirculating ball system, favoured at the time. Suspension at the rear featured swing axles and longitudinal torsion bars. British Rudge hubs and hydraulic drum brakes fitted inside the wheel rims, the drums being finned for cooling. Four brake shoes per drum applied the stopping forces.



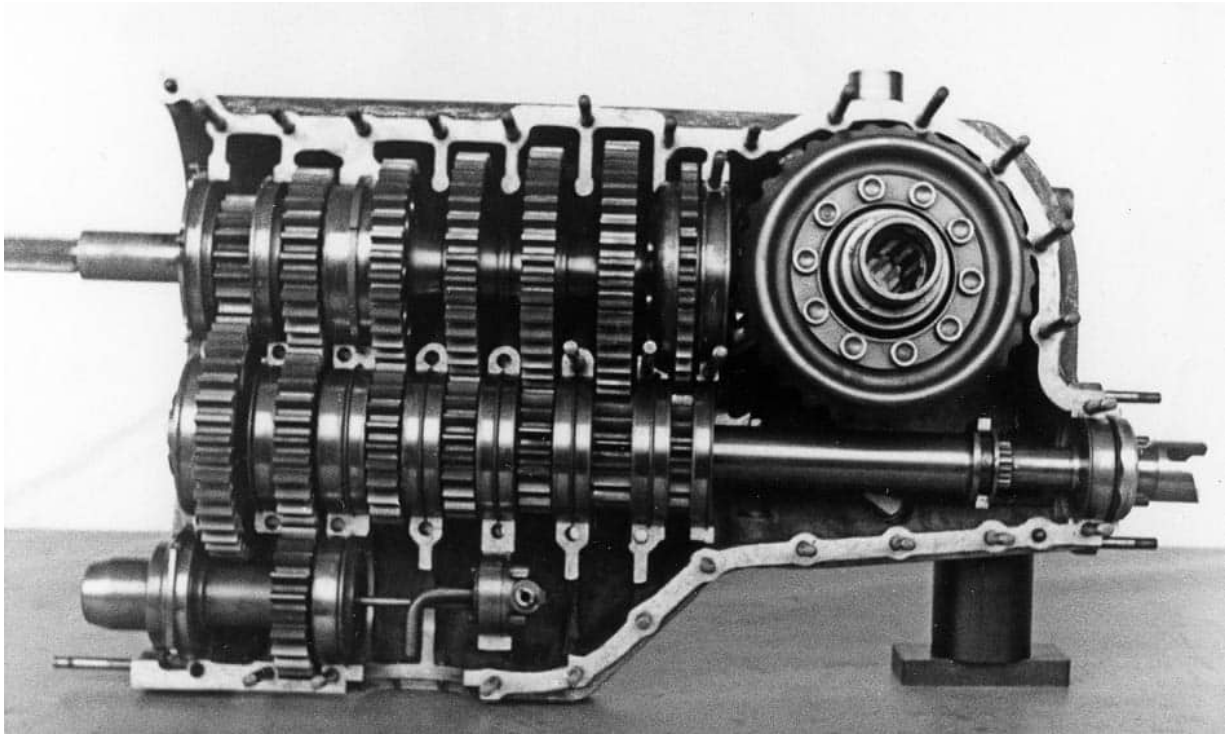
Tubular steel space-frame chassis, showing the installation of the flat-12 engine. (P)

The Porsche power unit, though, was perhaps the most impressive part, befitting its place in our story. The 1.5-litre, twelve-cylinder, water-cooled, flat horizontally-opposed (boxer) layout featured four shaft-driven camshafts, which operated valves via rockers arranged in a V-form atop hemispherical combustion chambers. Chrome steel alloy cylinder liners encased the pistons via connecting rods, fitted to a Hirth crankshaft inside an alloy crankcase, vertically split on its crankshaft centre line. Twin horizontally-mounted Weber carbs attached to the multi-stage Rootes mechanical supercharger, feeding alcohol fuel/air mix to the single-plug-per-cylinder combustion area, which received its sparks from twin magnetos. The engine lubrication was handled by three pumps dealing with the dry sump lubrication system. As this was a water-cooled engine, the water cooling radiators were located behind the nose. Power output was foreseen as 385hp at 10,600rpm. It is said the engine, with all its mechanical noises and that of the induction and exhaust, made a fantastic sound and ran like a turbine. For this car Porsche originally foresaw an all-wheel drive configuration and five forward speeds (one reverse) delivering the drive via a multiplate clutch that ran in a bath of oil. Driveshaft for the rear wheels ran alongside the gearbox housing.

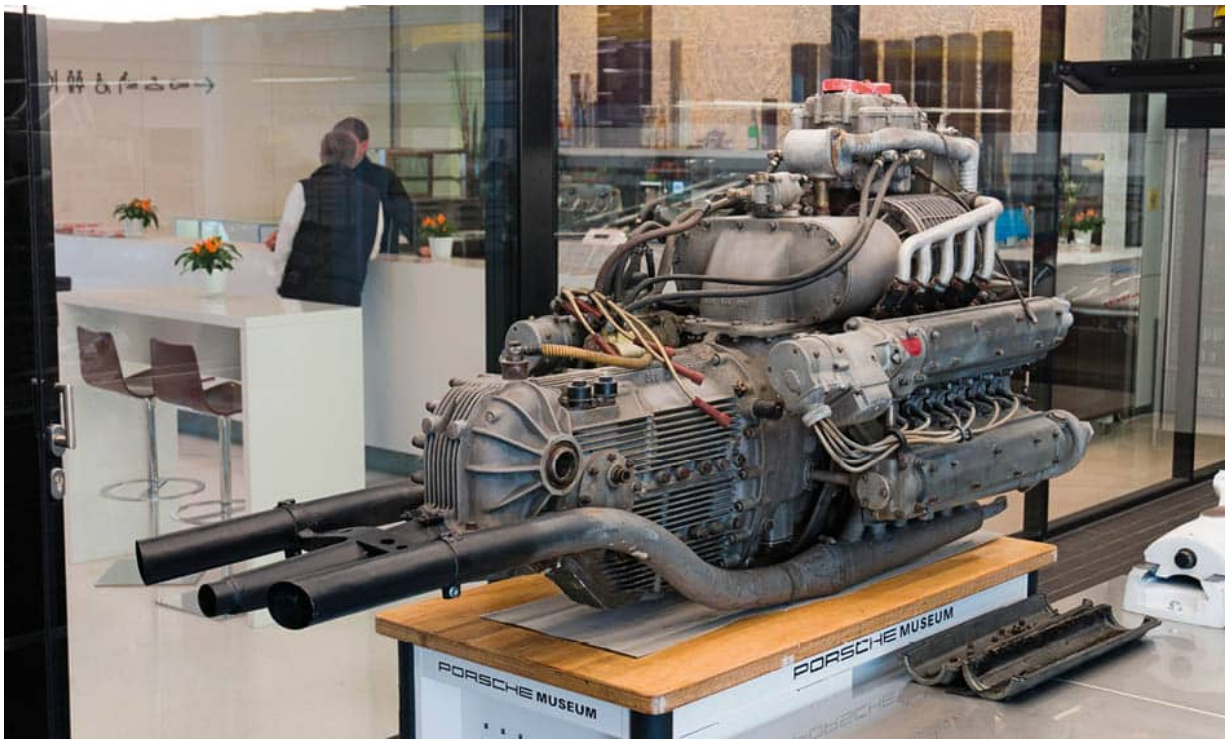
Gear selection was similar to a sequential motorcycle set-up, using a ratchet-like progressive shaft, the gearlever just moving forward or back in one plane. A driveshaft also ran to the front wheels from the gearbox when the four-wheel drive system was in use. The front wheels could be driven as and when the driver wanted: he selected the choice by an in-cockpit lever. Overall, the car weighed in at 878kg fully loaded and with driver. Ferry and his team had done a fine job, even receiving praise from old Dr Ferdinand Porsche himself, who is reported to have said: “I wouldn’t have done a single bolt any other way.”



Nearly there: the distinctive look of the Cisitalia Grand Prix car takes shape. (P)



1948: the five-speed sequential gearbox of the 1500cc flat-12 engine. (P)



The Cisitalia flat-12 can be seen today in the Porsche Museum. (P)

The facts:
Wheelbase 1.6m
Overall length 3.9m
Height 1.1m
Four-wheel drive (optional to the front wheels)

Engine:
Twelve-cylinder 1492.6cc
Compression 9.2 to 1
Power 385hp at 10,600rpm

The engine was tested in Italy, in Turin. Ferry Porsche said in a later interview: “The first test runs [of the car] were made in Argentina. None of our people could be there and they lacked the prerequisites for systematic testing. That first vehicle didn’t have all-wheel drive, either.”

The Dusio Cisitalia single-seater story is shrouded in dramas, and the then-unique mid-engine Grand Prix car unfortunately never raced. This was hardly down to the design of Porsche, but more attributable to the up-and-down nature of the financial situation surrounding Cisitalia, and a company set up by Dusio in Buenos Aires named Autoar. Eventually Dusio was forced to liquidate the Autoar company, for reasons that are unclear, but he gave the one and only Grand Prix car to Argentina’s President Perón, a racing fan, who put it in his private museum.

In 1949 when the aforementioned Herbert Linge had rejoined the Porsche team in Stuttgart, the part of the company that had moved to Gmund in 1944 now began the process of returning to Germany. Porsche was well on the way to launching the new car, which would become the now legendary 356. Herbert Linge: “The American soldiers were still around when I went to Reutter to join Erwin Komenda. At first I had found some work at Hahn, the big VW place in Felbach. I lived in Weissach, so I got that old motorbike to do the distance. It was a Royal Enfield – you know, 1924, I think. It was easier when I went to Reutter. Better still when I moved over to the old Werk 1 in Zuffenhausen. I had been informed that Porsche was

coming at the end of the year (1949) back to Stuttgart. Mr Komenda told me that I had to wait for a while before everything was going on again, and Mr Ferry Porsche himself was coming and two or three of the engineers. The new cars, all aluminium ones, had been made in Austria. Reutter had started making the frames for the 356, and things had started to move along sufficiently so that in February 1950 we moved over to a bigger place, now Werk II."

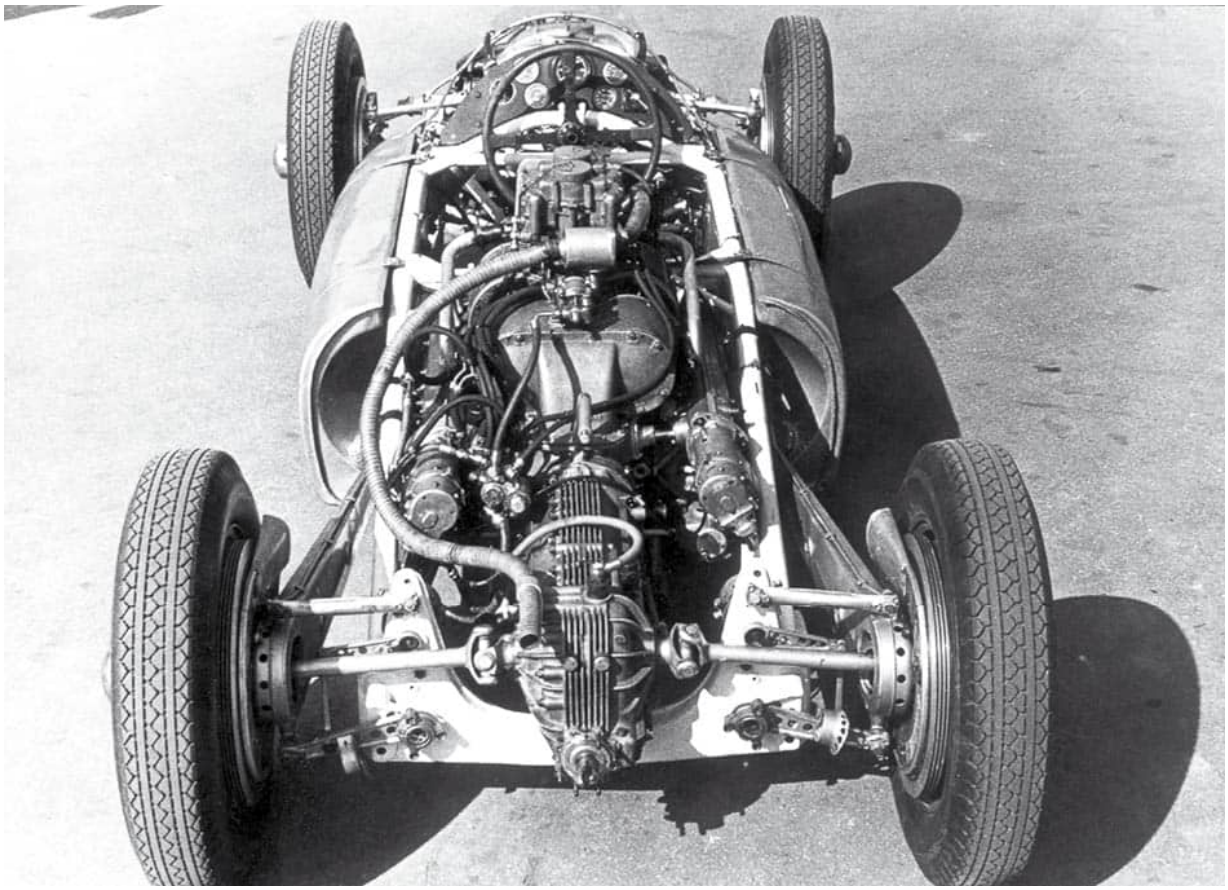
The accompanying table shows the early engines that would be the result of the work at Porsche Design:

Year	Type	Cyls	cc	Cars	Power	Notes
1932/37		V16		Auto Union		
1938	114	V10	1500cc	F Wagen		Type 114 F Wagen Type 116 racing car
1939	60	Flat-four	985cc	KdF Wagen	24hp	Berlin to Rome
1939	60		985cc	60K10	50 hp	
1939	115		1100cc			Engine with hemi heads and a supercharger. Single ohc
1946	360	Flat-twelve	1500cc	Cisitalia		Albert Hirth-designed power unit, roller bearing cranks. Supercharged

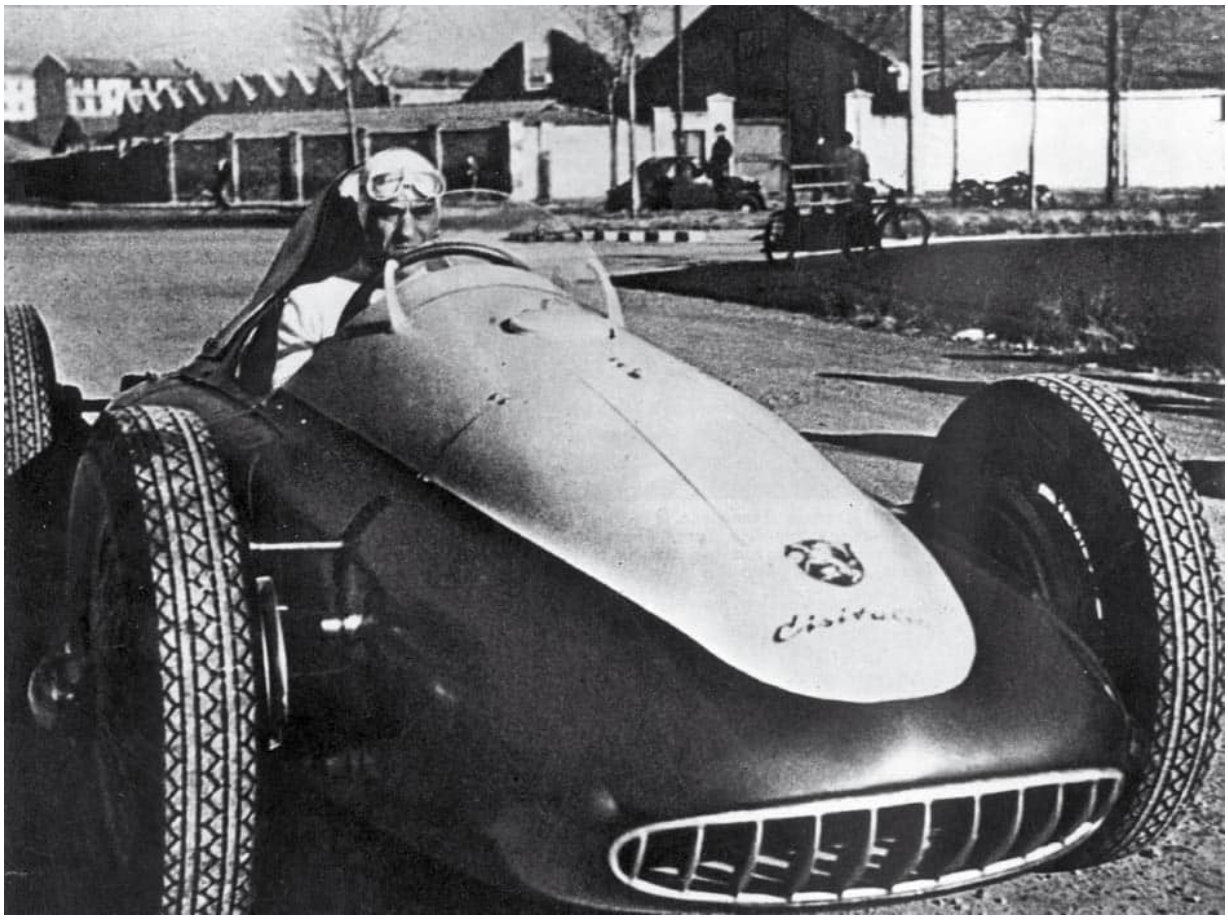
Whilst the first hand-built examples of the new car were coming out of Gmund, Ferry Porsche was already thinking about racing them, though at this stage the board was not keen. In an interview with *Porsche Panorama* magazine in 1979, Ferry Porsche is reported as saying: "It was an old dream of mine. In the last years before war broke out, in 1938 and 1939, we wanted to develop a small sports car based on the Volkswagen. But we were told then that a state-owned firm couldn't deliver parts for private business use. So we developed our own 1.5-litre sports car along the lines of the Auto Union racer. This had a mid-mounted engine, an in-line five, such as Auto Union uses in today's Audi. Ours, however, featured dual overhead camshafts and hemispherical combustion chambers. The gearbox was behind the rear axle and three [people] could sit abreast in the front, with the driver and steering wheel in the middle or on the left. When war came, we had to set aside all such plans and drawings." The first Porsches to race postwar were those early aluminium coupé versions built at Gmund. Their first victory would

come at Le Mans in 1951.

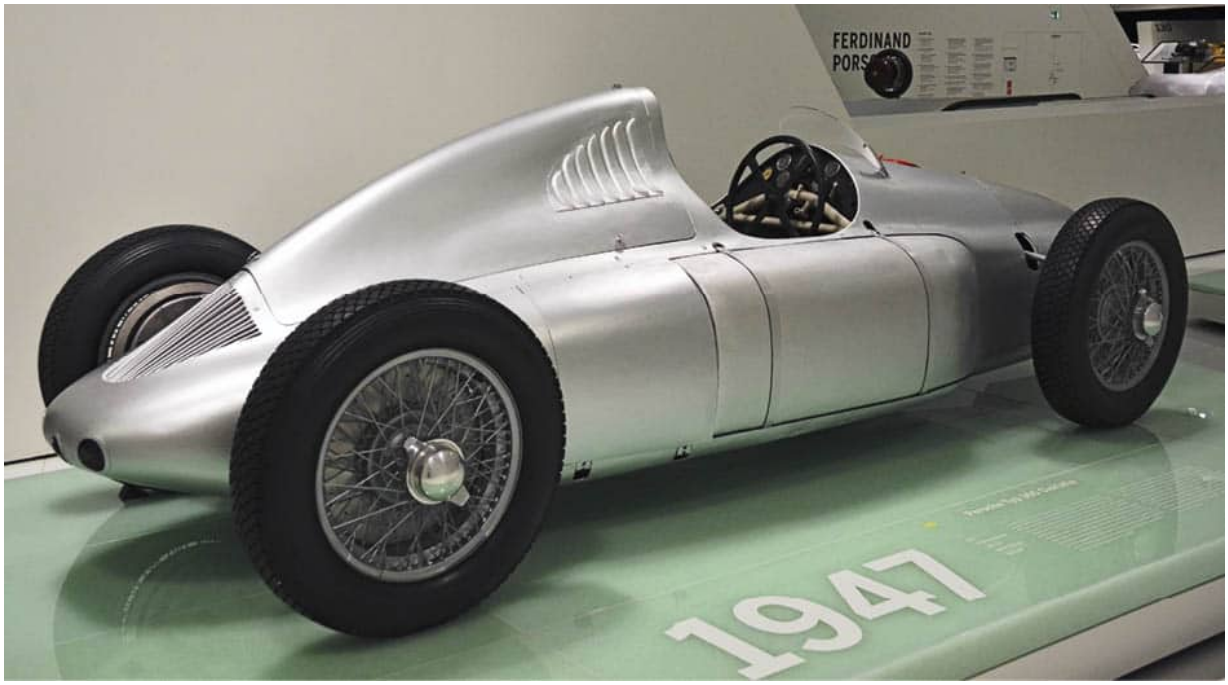
Our introduction here is now at an end; it already shows the advanced thinking of Dr Ferdinand and now Ferry Porsche and the design team in Gmund. Porsche cars themselves, both road and racing, have been and, no doubt, will continue to be covered adequately by others. We now move on and begin our story of racing cars built by other racing car builders who turned to Porsche for motive power.



The complex but ingenious Porsche-designed engine installation. (P)



Tazio Nuvolari seated inside the finally completed car that never raced. (P)



The mid-engined Cisitalia can be seen today at the Porsche Museum in Stuttgart. (RS)

Chapter 2

The early days – the 1950s

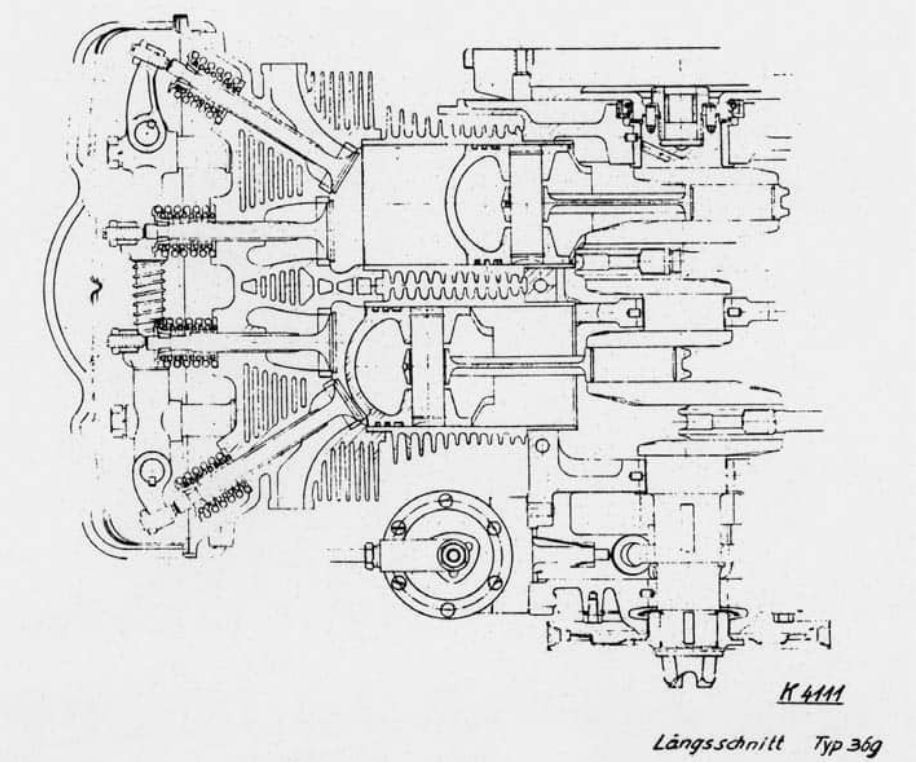
Whilst Ferry Porsche wanted to go racing in the late 1940s, the rest of the family was not so keen. Others not connected to the Porsche family, however, were keen. One prominent name worthy of inclusion here is Petermax Müller, who was based in the village of Velpke, near Wolfsburg. In 1947 he had close connections with Volkswagen. He had met up with an engineer by the name of Müller Vogelsang, who had been disabled by a serious war injury. Vogelsang, a clever engineer, wanted to get involved in racing again, having been a serious player before the war. He had developed some high-performance cylinder heads for the VW engines: an engine type that was destined to be the basis of the power unit used in the new Porsche 356; at this time that car had not yet been built. However, Petermax Müller was already creating a new sports car for racing, using VW parts still in various stores after the war. He used these 'Vogelsang heads' to help him win the 1100cc class sports car championships in 1948 and 1949.

The aforementioned Petermax Müller was also a good friend of one Huschke von Hanstein (full name Baron Fritz Huschke Sittig Enno Werner von Hanstein), who was already a friend of Ferry Porsche; von Hanstein, too, had been a capable motorsport competitor before the war. After WWII he had been brought in to Volkswagen at Wolfsburg, then under Allied management. He later relocated to Porsche, recommencing his motorsport ambitions with Petermax Müller just prior to this move. Von Hanstein would play an important role in Porsche, and was also on good terms with a newly-appointed (1950) but already well-known Volkswagen agent, Walter Glöckler.

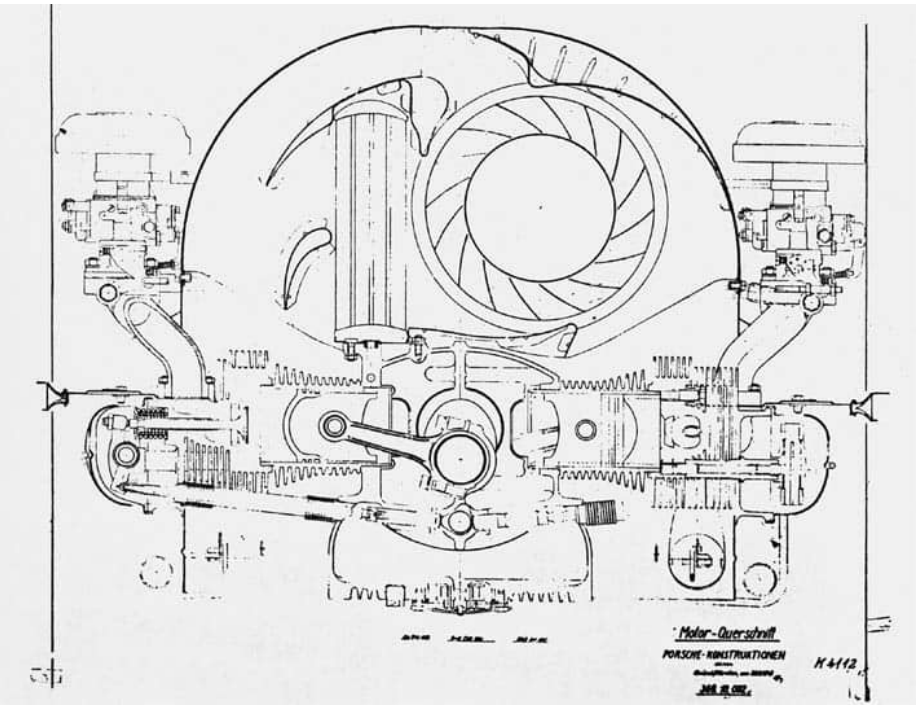
Baron Huschke von Hanstein in the Petermax Müller-created car powered by a specially tuned Volkswagen engine, 1948. (P)

On 19 March 1947, one of the most important men in the history of the Porsche organisation, Ernst Fuhrmann, had joined the company, at first in Gmund as an engineer. Having trained at the Vienna Technical University, he worked with AEG from 1943 until he joined Porsche four years later to work under chief engineer Karl Rabe. His work on developing the VW-based push rod engines introduced him to the Porsche engine types already attributed to Karl Rabe's team: the types 528, 546 and 616. In July 1952 he was asked to design and construct a new high-performance racing engine. It had to be ready for the start of the 1953 racing season, when the Porsche board was to have a rethink about racing, possibly, though we don't have official information to confirm this, with the intention of entering motorsport in its own right.

Fuhrmann's design team comprised Herren Forstner, Rist, Glöckler and Schrag. Together, working day and night, they created an engine that was to become the aspiration of many racing then, and even today in Historic racing. The Type 547 air-cooled flat-four, 7000rpm, 1500cc engine ran for the first time on 2 April 1953. Known to the outside world as the Fuhrmann 4-cam Carrera motor, it would win at the Mille Miglia and Le Mans in 1954. Amusingly, it is quoted in Rolf Sprenger and Steve Heinrich's excellent work *Carrera* that the engine was known within Porsche as the drawer motor, because the top-secret development project team kept its parts in a drawer under the bench; when any uninvolved person entered the workshop the drawer was closed! (Opinions as to the authenticity of this story vary.) This engine was produced until 1965, by which time Fuhrmann had left Porsche (in 1956) to join the Goetze Automotive Components Company, becoming its technical director. A few years later, in September 1971, Ferry Porsche brought Dr Fuhrmann back into Porsche prior to the family's withdrawal from the operational management of Dr Ing hc F Porsche AG. We will hear of Dr Ernst Fuhrmann and this engine frequently in this part of our story, for it was to be the engine that powered many Porsches and non-Porsches to victory in this period.



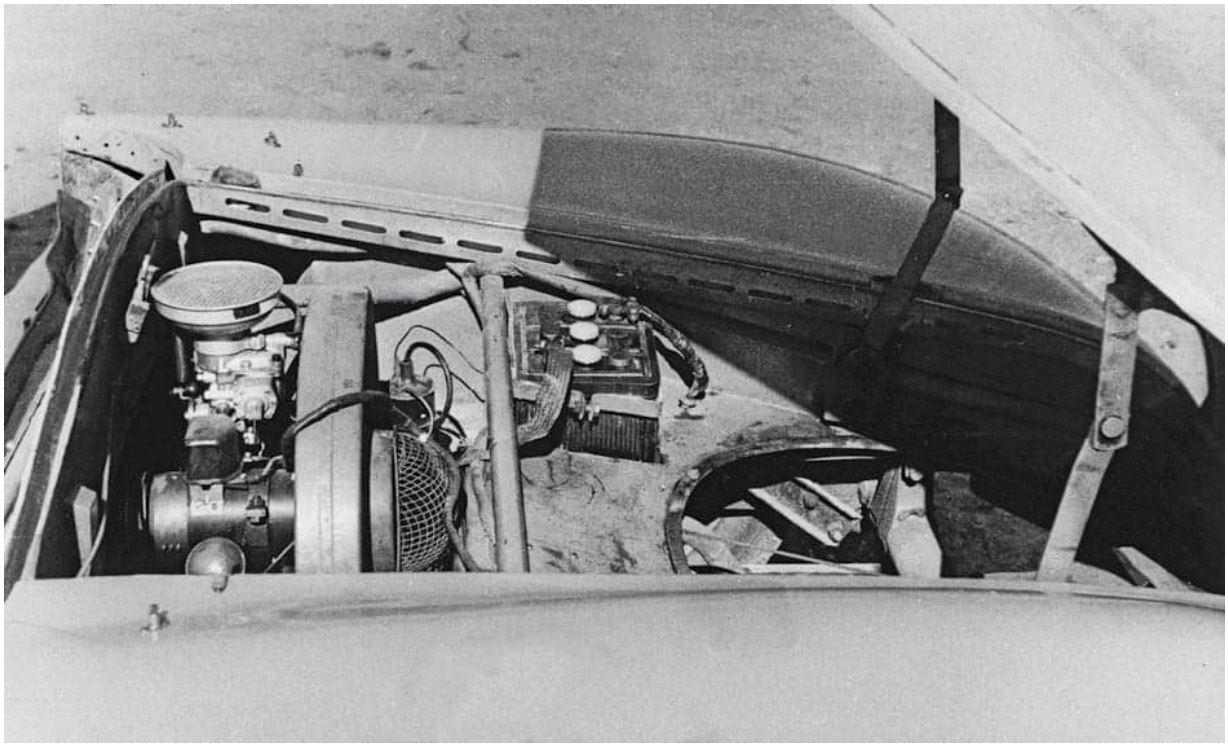
A section drawing of the Porsche 48hp (40bhp) Type 369 developed from the 1086 VW engine used in the 1950 Glöcklers. (P)



A cross section of the Type 369 engine. (P)

Glöckler-Porsches

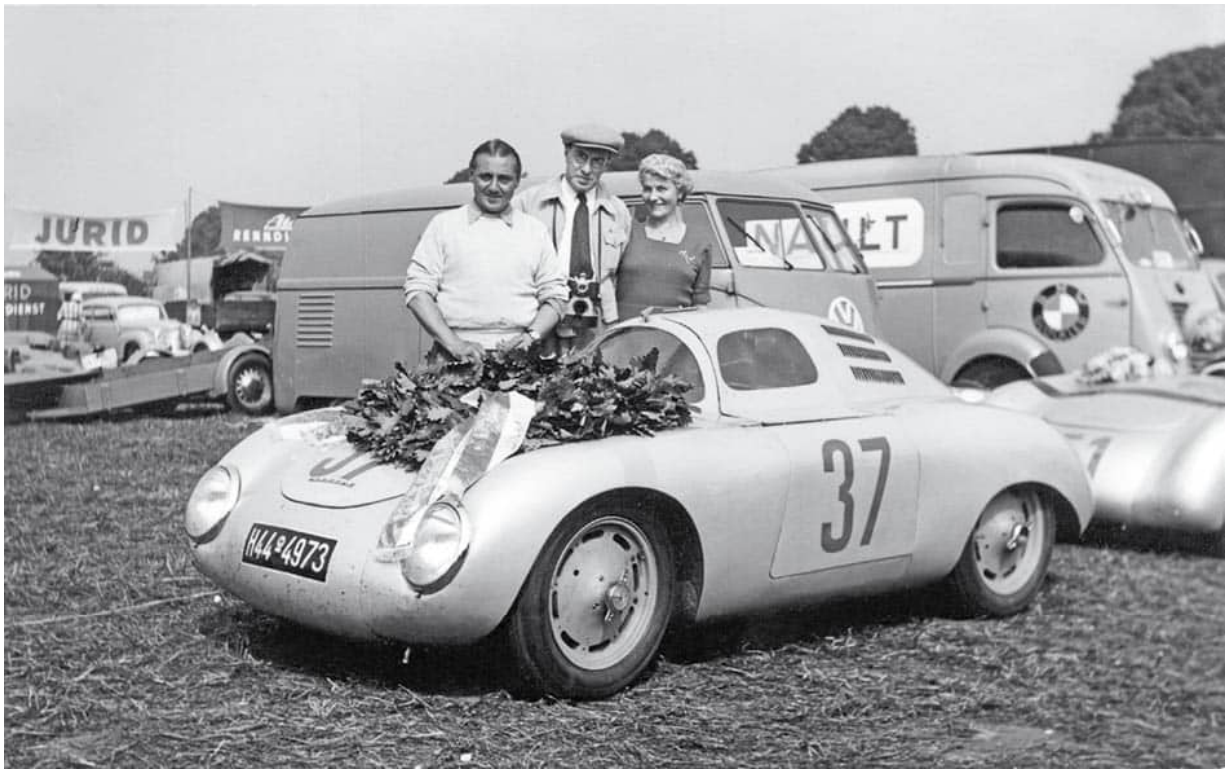
Glöckler was a racer (born in December 1908 to a family specialising in motorcycles); he knew what Porsche was doing, but he felt he could do better on the racing scene with a better-balanced car. Before and after the war he was a sales agent for Hanomag; he had already built and raced a Glöckler-Hanomag, and knew Huschke von Hanstein, with whom he had regularly raced before the war. With this connection he became an agent for Volkswagen, which inevitably led to greater contact with Porsche. As already mentioned, Ferdinand and Ferry Porsche were well acquainted with both von Hanstein and Glöckler. Glöckler believed in, and turned to, the mid-engine concept. The afore-introduced Herbert Linge, one of the 'legendary men' of Porsche, says: "He (Glöckler) started in 1948, using VW parts to make his own racing car. Glöckler was in very close contact with Porsche, and he made the first Glöckler Porsche. I know the car very well. Whilst we at Porsche could not immediately go racing, Glöckler could do so with his own cars. We started when our French importer, August Veuillet, was the first to race the Porsche cars, one of the aluminium coupés – the so-called Gmund coupés. These aluminium cars were prepared in Werk 1 to race at Le Mans in 1951. They won their class and Veuillet had so many calls after this, asking for cars, that Mr Porsche made a decision: he said that we never spent any money for newspaper advertising or anything like that; we would go racing somehow, and that's the best we could do. People would see us winning and they buy our cars. He was right."



The original mid-engine installation; the first Porsche-created road car in 1948 with this mid-engine concept. (P)

11 June 1950: Walter Glöckler driving the Glöckler No 1 to a first victory in the 1100cc class at the Nürburgring. With Porsche power, Glöckler would win the 1100cc championship in Germany in 1950. The No 1 'Eigenbau' (special) carried a VW badge on the front, and Porsche lettering. (P)

Hockenheim 1951: the 51 car, driven this time by Hermann Ramelow, took the victory. (P)



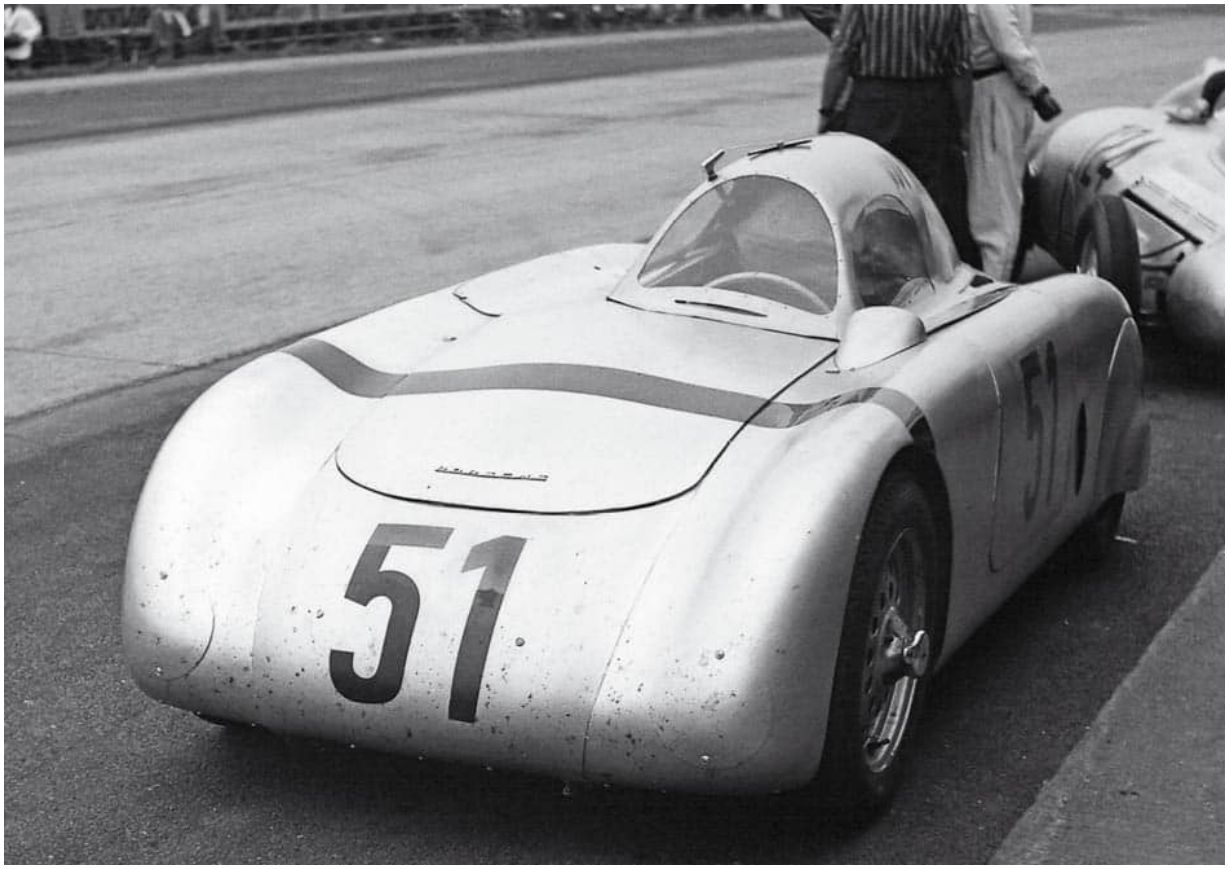
Walter Glöckler, left, winner of the 1500cc class at the Grenzlandring. This car is believed to be the Glöckler No 2, with its canopy; it was powered by a 1500cc development engine. The Glöckler No 1 is just visible in the background, right. (P)

First, though, it was Glöckler who would do most of the racing, and, in so doing, raise the profile of Porsche. Along with his workshop manager, Hermann Ramelow, he had created a new car. Its engine, ahead of the transmission, was no longer listed as a VW unit, though of course its initial design drew on the air-cooled principles of Dr Ferdinand Porsche's wartime creations for VW. Now, though, the engine they would use was an all-Porsche creation – a Type 369 1.1-litre unit, putting out around 48hp.

The Porsche-powered Glöckler cars would win the 1950 1100cc class of the German Sports Car Championship, having beaten the previously all-conquering Petermax Müller VW-based cars. Results in the Porsche-powered car were impressive:

11/6/1950	Nürburgring Eifelrennen	1100cc	Walter Glöckler	1st
6/8/1950	Schauinsland Hillclimb	1100cc	Walter Glöckler	1st
17/9/1950	Grenzlandring	1100cc	Walter Glöckler	1st
1/10/1950	Feldberg	1100cc	Walter Glöckler	1st

For 1951, as Glöckler grew even closer to Porsche, his cars started carrying the Porsche badge alone, and Porsche as a company began to assist him. In the end, it is said, seven Glöcklers were built, all powered by Porsche. The design of these was to be reflected in the future creations of the Porsche company itself. In fact, it might almost be said that Walter Glöckler was the father of the Porsche racing cars that were to follow, the first being the type 550, where early examples were almost identical to the Glöckler. The first official Glöckler-Porsche mid-engined 1500cc sports car ran at the Freiburg-Schauinsland hillclimb in August 1951, winning its class and establishing a class record. Hermann Kathrein also drove a Glöckler 1100cc car to win that class.



Glöckler-Porsche No 1 at the Grenzlandring, 9 September 1951; driven by Hermann Kathrein, it finished 2nd in the 1100cc class. (P)

Officially now a Glöckler-Porsche, the 1500cc at the start of the Freiburg-Schauinsland hillclimb, August 1951. (P)

Glöckler No 2 having its detachable, Weidenhausen 2-312-37 body/canopy fitted; with the 85bhp Type 502 engine, the Glöckler No 2 weighed in at 450kg. (P)

Glöckler's trademark was quality: the cars were immaculate, beautifully put together, whilst remaining very light and, therefore, with the power available, very racy. This particular car was fitted with a new Porsche Type 502 engine, a 1500cc unit that was to become the staple diet for the 356. It was also the basis for the next generation of engine whose first drawings were being prepared in late summer 1952, the aforementioned amazing Type 547 – a 110bhp 1498cc quad-cam engine. It made extensive use of aluminium components.

On 14 May 1951, Hermann Ramelow won a race at Hockenheim with the 1100cc car, and Hermann Kathrein took a 3rd place on 3 June in the International ADC Eifelrennen sports car race.

The accompanying table shows the race results for the Glöckler-Porsches in 1951:

Hockenheim	14/5/1951	Hermann Ramelow	1100cc, 1st	Glöckler No 1
Nürburgring Eifelrennen	3/6/1951	Hermann Kathrein	1100cc, 3rd	Glöckler No 1
Schauinsland Hillclimb	5/8/1951	Walter Glöckler	1500cc, 1st	Glöckler No 2
Schauinsland Hillclimb	5/8/1951	Hermann Kathrein	1100cc,1st	Glöckler No 1
Grenzlandring	9/9/1951	Hermann Kathrein	1100cc, 2nd	Glöckler No 1
Sachsenring	30/9/1951	Hermann Kathrein	1100cc, 1st	Glöckler No 1

Glöckler was progressing development along with Porsche, and the 1500cc Glöckler-Porsche No 2 was fitted with an experimental Type 502 engine from Porsche, which had needle bearings on the crankshaft and roller bearing connecting-rod ends. It is said that, by the end of 1951, the 1500cc 502 was good for 85hp at 6200rpm. This engine was to endure as the standard pushrod 1500 (1488cc) for nearly ten years, and the roller-bearing crank was to stay in the programme until September 1957. As we saw in an earlier photo, Glöckler also experimented with a closed cockpit, developing this idea further for 1952.

During 1951, Glöcklers powered by Porsche engines also set a number of 1500cc class records at the French race track frequently used for that exercise in the 1950s: Montlhéry, just south of Paris, where they set new records for 500km (187.73km/h/116.60mph), 1000km (185.63km/h/115.30mph), and 6 hours (184.11km/h/114.35mph) – remarkable when one realises that these

were set in an open-top car, the streamlined canopy being put to one side on this occasion. Glöckler No 2 returned to an open-cockpit style, and, for 1952, would find its way over to Max Hoffmann in the USA (VW and soon to be Porsche dealer) with help on hand from Herbert Linge.

Hoffmann, an Austrian-born son of a bicycle maker, grew up to be an accomplished motorcycle racer like so many of his contemporaries (Karl Abarth, for example), and moved on to racing DKWs. He was one half of Hoffmann & Hoppert car importers of quality machinery: Rolls-Royce, Talbot, Delahaye and several more. However, with the rise of the Nazi regime in the mid 1930s, alarm bells started ringing and, as he was part Jewish (on his father's side), Max Hoffmann determined to leave Austria and move to France. As events turned out, that was not such a good idea, and in 1941 he left to go to America.

He found the American market difficult, as all the production there turned to the war effort (the USA joined the Allies in 1941), so he decided to get into the jewellery business; his talents shone through, and the business became successful. This brought him the financial resources to open a car dealership in 1947. Porsche was not his first choice. He renewed his old acquaintances with Delahaye, Jaguar, and, when it arrived, Volkswagen – a strange mix, but it was business! According to some reports, he was about to drop the VW deal until he was introduced to Ferry Porsche, and got to hear about the Glöckler race cars. Porsche did not have any pure race cars at that time (1950/51). Suffice to say that Hoffman (now with only one 'n') would go on to be one of Porsche's most successful importers in the USA in the early days of the 356 model. Max Hoffman knew the advantages of marketing and promotion, and he knew how racing played its part in this, so he took his new racing car, the aforementioned Glöckler No 2, to the races, running it in the 1500cc class, where he would finish 10th overall, and winning the class at the Vero Beach 1 Hour endurance race.

The now slightly modified Glöckler-Porsche No 2, acquired by Max Hoffman, arrived in the USA in 1951. All the Glöcklers had central knock on/off hub wing nuts with drilled steel wheels; some also had experimental lightweight magnesium wheels available for some events. (P)

Porsche and Glöckler had found their way to the USA. The 'Powered by Porsche' story outside Europe had begun. Hoffman raced the No 2 Glöckler eight times, winning on three occasions. He was also leading at Bridgehampton on 24 May 1952, until he went off and hit some hay bales, recovering to finish 2nd.

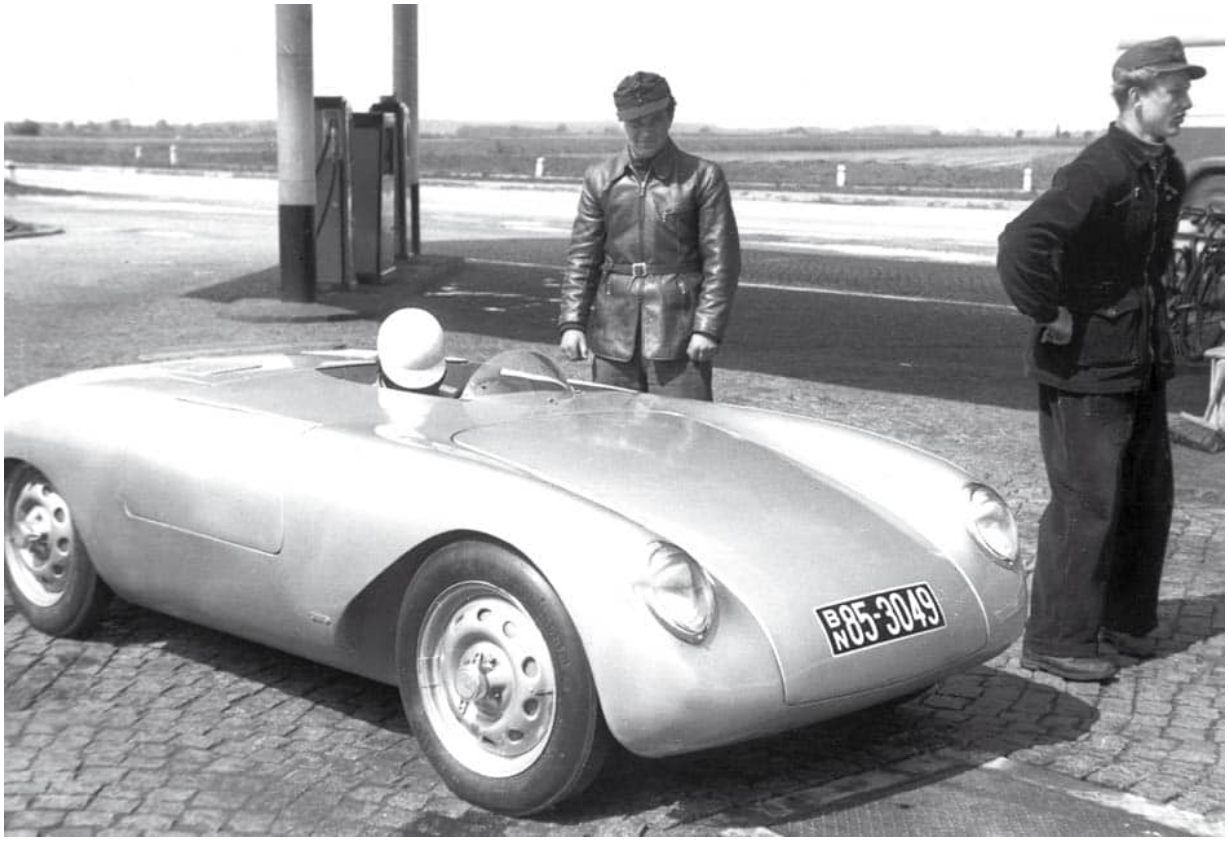
This No 2 Glöckler was subsequently sold to Porsche dealer, Ed Trego, who put Karl Brocken in the driving seat. Little success followed, however. We will pick up more about the Hoffman part of the story in a moment. In Europe, Walter Glöckler was busy creating more cars, and the No 3 saw the light of day on 25 May 1952 at the Eifelrennen International at the Nürburgring, powered by the 1500cc engine, which was now giving 86hp+ using alcohol fuel. Helmut

Glöckler, Walter's cousin, would take this car to victory in the season-long German Sports Car 1.5-litre Championship that year. No 3 started life as a conventional open-top Glöckler, but it had grown a hard top by 3 August for the German Grand Prix, finishing 4th overall in the race. By now the Glöcklers were really making Porsche think that it was time Porsche itself entered the ring with its own sports racing cars, in its own name. At Le Mans in 1951, it had run the streamlined Gmund coupés Type 356, winning the 751-1100cc class in 1951 and again in 1952. But it was evident that if Porsche did not get a real racing car out soon, other manufacturers would start challenging the Porsche-powered Glöcklers in the 1100 and 1500cc classes. In fact, Glöckler itself was already planning upgrades for 1953. It had on the drawing board a very smart 'roadster' in two-tone livery, its body once more crafted by Weidenhausen, the 'carrosserie'-building company that had been responsible for the previous Glöcklers. This was No 4.

24 May 1952 at the SCCA Bridgehampton races: left we see Max Hoffman attending to the front hub, whilst on the opposite side is the young Herbert Linge. (P)

The Glöckler No 4, shown below, was powered by the Type 528 1.5-litre 356 super engine, 1488cc 70bhp, called at the time the roadster. Its body was specially commissioned by client Hans Stanek, and built by Weidenhausen. (P)

The Glöckler No 4 in 1954 in preparation for the 12 Heures de Hyères. The driver is believed to be von Frankenberg; Richard von Frankenberg was joined by Swiss driver Walter Ringgenberg in this event. Unfortunately this time it was a dnf. (P)



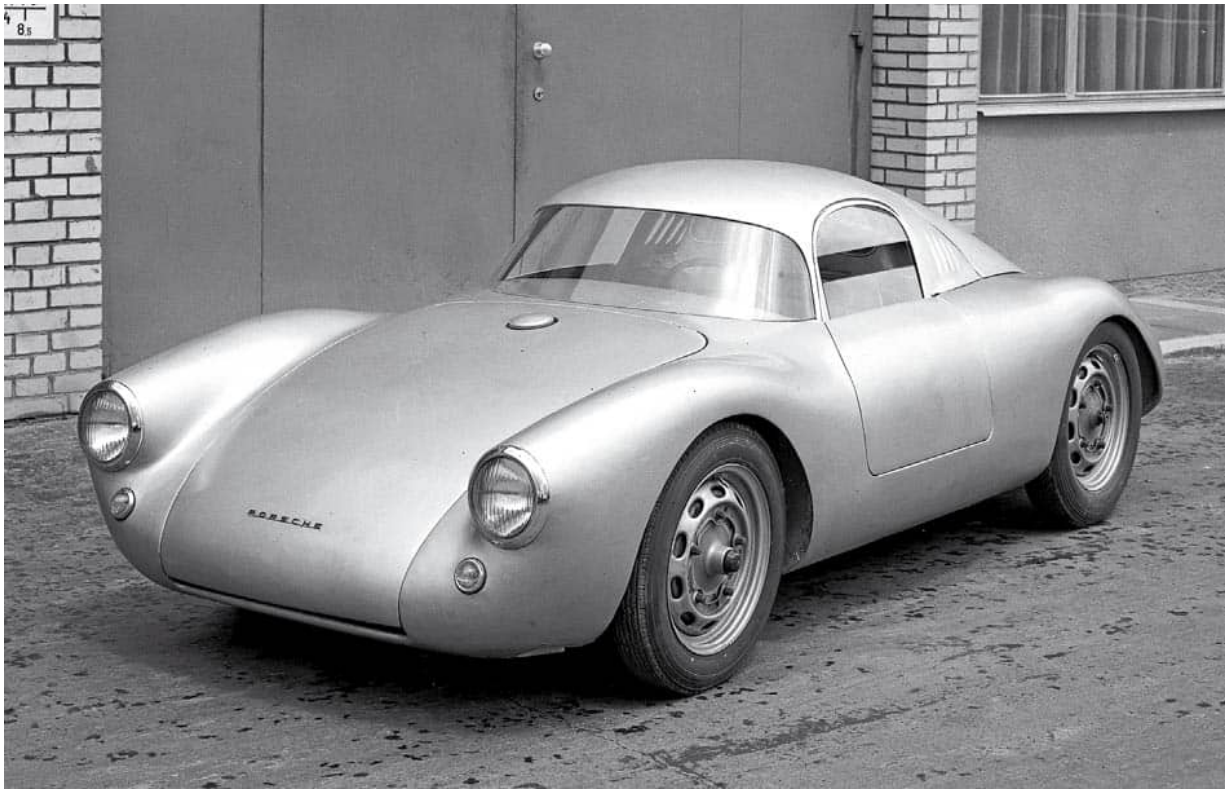
Glöckler No 5: 1100cc all-aluminium body, again by Weidenhausen; photo dated 17/5/1952. (P)

It first appeared at the Geneva Motor Show of 1953; interestingly, on the Porsche stand. The new car had a Porsche Type 528 engine, as was appearing in the production Porsche 356 1500 Super. Stanek was to race it in Switzerland at the support race for the 1953 (and eventually also 1954) Swiss Grand Prix. He also ran it at the Schauinsland Hillclimb on 8 August 1953. Glöckler No 5 appeared, too, at the 1953 running of the ADAC International Eifelrennen race, where Richard Trenkel took it to an 1100cc class victory.

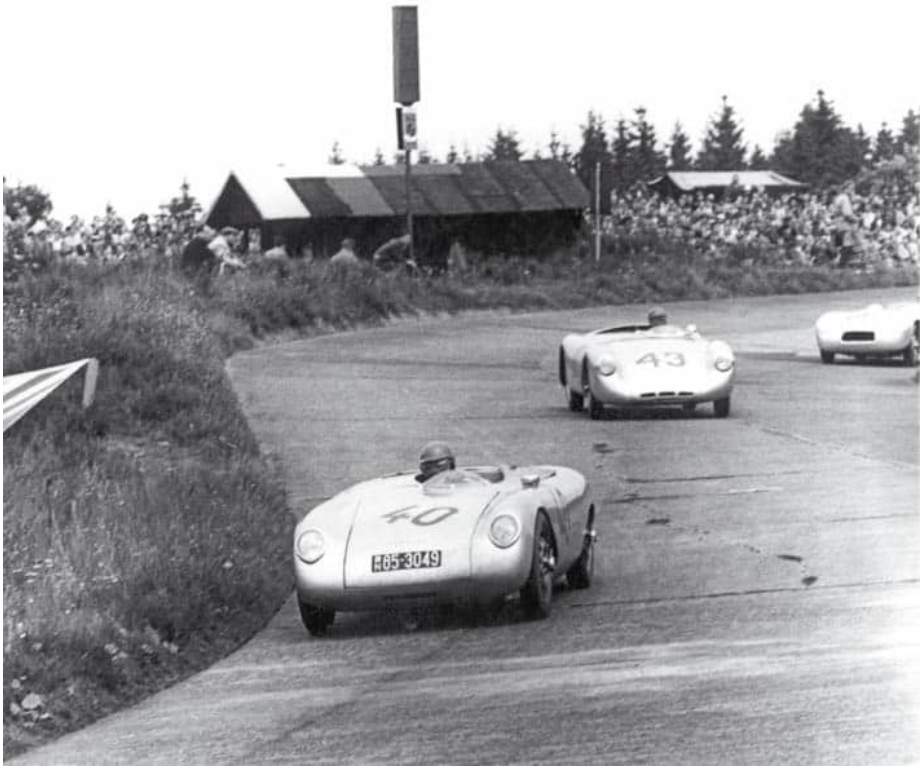
Top performances continued for Glöckler through 1952, 1953 and 1954; the accompanying table showing just a small selection of results in Europe.

25/5/1952	Nürburgring (Helmut Glöckler), Eifelrennen Sports 2-litre	1st in class
20/7/1952	Essen II Gruga-Preis (Heinz Brendel)	1st in class
3/8/1952	Nürburgring German Grand Prix support (Helmut Glöckler)	4th overall
28/9/1952	Avus Ring 1500cc (Helmut Glöckler)	2nd in class
28/9/1952	Avus Ring 1100cc (Heinz Brendel)	1st in class
3/5/1953	Chemnitz 1100cc (Hans Friedrich Hofman)	1st in class
15/5/1953	Leipzig 1100cc (Hans Friedrich Hofman)	2nd in class
31/5/1953	Nürburgring Eifelrennen Sports 1100cc (Richard Trenkel)	1st in class
31/5/1953	Nürburgring 1100cc (Bernhard Cappenberg), Glöckler 1	5th in class
30/8/1953	Nürburgring 1000km (Trenkel/Schlüter), Glöckler 5	4th overall
	Entry by Porsche Werk.	

This is the Glöckler No 3 that would influence the new Porsche design, a sports racing car of its own which became the type 547, and eventually the type 550. Glöckler 3 had a 1952 Porsche 356 chassis with open alloy bodywork by Weidenhausen. (P)



The first true Porsche racing car type 550. Two cars would race at Le Mans in 1953, one with Richard von Frankenberg/Paul Frère at the wheel, which finished 15th overall and 1st in the 1101-1500cc class, covering 3332.3km over the 24 hours. 2nd in the class and 16th overall, with just over 2km less, were Hans Herrmann/Helm Glöckler. The engines in those cars were the pushrod type. (P)



Glöckler No 5 on 1 August 1954: Richard Trenkel 8th at Rheinland-Pfalz, now powered by the Porsche Type 547 1.5-litre Fuhrmann 4-cam engine. (P)

Such results make it easy to see that the mid-engine Glöcklers were pretty good cars, and, of course, with Porsche being heavily involved, the two companies were working almost as one. Richard Trenkel took victory in the 1953 German Championship. Now, with Porsche's involvement growing, the Glöckler cars began to be called simply Porsches. Created by Karl Rabe in the Porsche Design Bureau, the Type 547 car in turn led to the much-revered Porsche Type 550 that would win its class at the 1953 Le Mans. The rest, as they say, is history!

Glöckler carried on in 1954, mixing drives in its own cars with driving those official Porsche entries. Glöckler No 6 was built up into a road car to be raced in the Liège-Rome-Liège road race run from 18-22 August 1954. Racing at No 27 at the start, Helm Glöckler/Nathan are not recorded as classified in this marathon event, which was won by Helmut Polensky/Herbert Linge, starting at No 86

in a factory development Porsche 356 powered by the new 4-cam engine. As Porsche became dominant and Glöckler turned to his business interests, the Glöckler cars would be moved on to private competitors until eventually their appearances faded out. The last recorded race for a Glöckler in Europe, though there may have been others, is listed as being by Günter Schröder in the 1500cc class of the Berlin Grand Prix on 25/9/1955.

In America, at the SCCA Palm Beach National races on 8 December 1951, VW importer and aforementioned new Porsche importer Max Hoffman had gone racing with the car brought over from Europe. Hoffman would go on to have a lot of success in the little car. As Herbert Linge told the author: “I already had a lot of contact with Glöckler in 1950 and 1951, then at the beginning of 1952 after Glöckler had the first car sent to America we were starting to sell the 356 there, but we (Porsche) found we had a lot of problems with the engines, due to the different quality gasoline, and all kinds of stuff which nobody had expected, so I was sent over there to Max Hoffman to sort it out. Hoffman was calling up every day to us in Stuttgart and saying ‘I need somebody who really knows about these new 356 cars.’ Max Hoffman always worked very hard, and in a different way to how Mr Komenda in Porsche worked. Komenda never wanted to build anything quickly: he wanted it to be correct and precise. Mr Hoffman wanted things quickly – still good quality, but quickly. He wanted a racing Porsche; one wasn’t available then, so he had got hold of that Glöckler No 2.”

The Glöckler No 2: Max Hoffman at the wheel at Bridgehampton in the USA on 24 May 1952. He finished 2nd after hitting straw bales lining the circuit whilst in the lead. (P)

With this car he went on to easily beat many of the bigger cars of the time – Jaguar XK 120s, etc. Linge continues: “Hoffman managed to get one of the Gmund coupés, as well as an early 356. He cut the roof off the coupé, and with three cars he entered the races at Bridgehampton in 1952; I can’t remember what happened to the other two cars. He had lots of calls, and four weeks later, at the next race, there were 20 Porsches on the start line!”

Hoffman ran in the up-to-1500cc class. The other two were No 43, Fritz Koster, who had the Gmund coupé, who came 3rd, and No 56, Karl Brocken, in the Ed Trago-entered 356 that dnf’d.

Top performances in the USA continued for Glöckler through 1952, 1953 and 1954; the accompanying table shows just a small selection of his results.

8/3/1952	Vero Beach 1 Hour Endurance Race (Max Hoffman)	1st in class
20/4/1952	Thompson Raceway Sports Car Race (Max Hoffman)	1st in class
24/5/1952	SCCA Bridgehampton Nationals (Max Hoffman)	2nd in class
12/4/1953	SCCA National Race (John von Neumann)	2nd in class
19/4/1953	Thompson Raceway Sports Cars (Max Hoffman)	2nd in class
19/4/1953	Thompson Raceway Sports Cars (Max Hoffman)	2nd in class
14/6/1953	Chanute Sports Car Races (John Urbas)	1st in class
5/7/1953	Stout Field Sports Car Races 1500cc (John Urbas)	1st in class

By 1954, Glöcklers Nos 2 and 3 that were sold to Max Hoffman in the USA had all found new owners. In the USA, Glöckler No 3 was acquired by Lloyd Barton in 1954, to be driven by Capt William Cooper, who came 2nd overall at the Savannah National Sports Car Races on 14 March 1954, and 2nd at the Offut Sports Car Races in July.

Herbert Linge says: “When I was seconded from Porsche to help Max from 1952 to 1956, he had started to sell lots of Porsches, and I had to go back to Porsche in Stuttgart every six months to get new instructions about the cars.” The reader needs to remember that this was the early days of Porsche as a company building customer cars. Cars were being built at a growing pace due to high demand and very frequently an improvement would be made. As Herbert Linge says: “There were always changes going on in the cars, and at that time there were no manuals, nothing! Hoffman’s customers, too, were racing and Max was sending me everywhere. At first I was by myself; then there were a couple of men who washed the new cars and polished them for delivery, but he had no mechanic. So I had my work for day and night! Then every weekend I had to go to one of the national races. He gave me a VW so I could go to the races to help the customers get their cars ready. Not only was I working on Max’s race cars, including the Glöcklers, but I was helping others as well. One day, I think it was after a hillclimb where we had a really fantastic result, he called me up (the workshop was two streets from the sales showroom) and said: ‘You have done a good job over the weekend: I sold nine cars this morning!’ Of course he was doing a lot

to keep the customer satisfied, and if somebody had a problem in Chicago, I had to drive to Chicago, sort the problem, and then maybe go down to Miami; I drove three or four times to Miami with a car, to get some carburettor fixed! Driving all over America, almost. Plus I used to come back to Germany, too, to do races. In 1954, I drove with Hans Herrmann on the Mille Miglia, with a new car, the 550 Spyder; it had the new 547 type Fuhrmann engine – that was my vacation!" For the record, Hans Herrmann and Herbert Linge are recorded as finishing 6th overall. Herbert then jumped on a transatlantic flight (they were slow in those days) to get back to work with Hoffman.

Hoffman continued to race his Glöckler-Porsches all over the USA. But as Herbert Linge says: "I was most of the time on the east side of the USA, and eventually I had two mechanics, one, who worked with me for about three months in New York, was sent to California, to look after some customer cars, mostly 356s. That's where Hoffman had made contact with James Dean, because James Dean at this time had a 356 Speedster. Rolf Wütherich, now our mechanic, and originally from Porsche, said: 'You have to have a faster car and you have to own a Spyder!' It was the car Dean was killed in, in 1955."

James Dean's car had a Fuhrmann 547 engine. A Dr William Eschrich acquired the wreck of the Dean Spyder, known as 'Little Bastard,' from Dean's family, and installed the engine in a Lotus Mark IX. It was raced at Santa Barbara on 17-18 March 1956. On 1-2 September, again at Santa Barbara, in a series of road races, Eschrich competed in a two-heat race, and is recorded as finishing 4th overall and 4th in class.

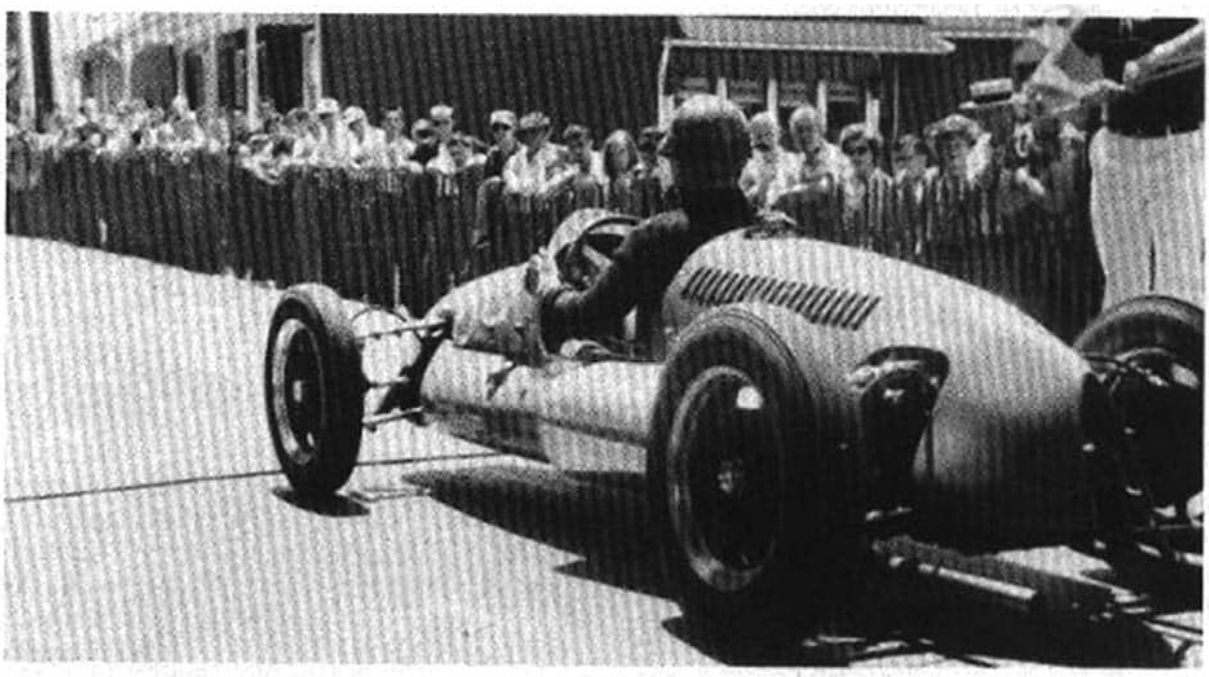
Glöcklers Nos 1, 4 and 5 continued to race in Europe, while Nos 2 and 3 raced in the USA on into 1955; the last event on the international scene is thought to be the Berlin Grand Prix on 25 September 1955, where Glöckler No 1 finished 12th overall with Günter Schröder at the wheel.

♦ ♦ ♦ ♦ ♦

Cooper-Porsche-Gordon Lipe

Here we look at the British Cooper influence on racing with Porsche engines. The author did not find any Porsche-powered Coopers in Britain, but in the USA, the Formula 3 single-seater Coopers created in the UK just after WWII were well known in the early 1950s. At the time, serious racers were racing big cars with big engines. However, the large cars were now being threatened by a plethora of little European sports cars, brought to the USA by returning soldiers. They were found to be fast and nimble, so, when the single-seater Cooper was introduced, interest was immediate. Gordon Lipe was one Jaguar XK120 driver who would try the Cooper. He became a regular and successful competitor. The little single-seaters at that time used motorcycle engines, then several owners tried fitting small car engines. Over the winter of 1953-54, Gordon Lipe (nicknamed Tippy) decided to install a flat-four pushrod Porsche engine in his Formula 3 Mk VII Cooper, and ran it for the first time at the Giants' Despair Hillclimb meeting at Wilkes-Barre, Laurel Run, Pennsylvania, in the USA. Listed as being a Formula 3 Cooper-Porsche special, it certainly ran, but according to the wonderful book *Formula III Racing in North America* by Harry C Reynolds, the engine seized before the car reached the finish line. The event took place from 22-24 July 1954.

The programme from that first sighting of a Cooper-Porsche in competition in the USA at the Giants' Despair Hillclimb. (HR)



No ordinary Formula III Cooper, but Lyeth's Porsche-powered car fitted with a supercharger. He left the line with spinning wheels and a deafening roar.

A newspaper photo said to be that of the Cooper Porsche 22-24 July 1954 Giants' Despair Hillclimb meeting. (HR)

Gordon Lipe in period, 4 July 1955, at Beverly National Sports Car race in the new full-bodywork version. Lipe took his Mk VII-553 Cooper-Porsche to victory overall, ahead of formidable opponents. (GK)

Interestingly, it is recorded that Lou Fageol set third-fastest time of the day in a twin-engine Fageol Porsche, the twin engines being Porsches. We will read more about Lou Fageol later. At Watkins Glen on 18 September 1954, we see Gordon Lipe out again in the 11-lap Seneca Cup race. According to a report from the period (courtesy of Duncan Rabagliati of Cooper fame in the UK):

"The Seneca Cup race started promptly at 10:00am with a paced lap led by Capt Eyston in the Buick Wildcat. On the pole was Alan Patterson with an Allard, accompanied by Harry Whitney's Formula 3 Cooper on the outside. As the pack rounded, the final turn into the starting straight, Capt Eyston gave the okay sign and they were off and running. Tippy Lipe's blown (supercharged) Porsche-engined Cooper, being known as the 'Pooper,' because of this blend of power and chassis, and George Weaver's Maserati, were off in a rush and out in front. By the fifth lap, Lipe had dropped to 4th place, and on the sixth he made a pit stop (due to blower – supercharger – belt failure) to try and regain some of the sensational power displayed in the early

stages. He returned to the race, but was never a challenger since the blower was without belts, and the windmill effect was not enough to propel the little rocket as before."

Over the winter of 1954-1955, Gordon Lipe took his car to Southport, Connecticut, where Bill Lloyd, a cousin of Briggs Cunningham, had a body shop. Here a sports car body was created for the 1955 season.

Gordon Lipe was to take his newly sports car-bodied Mk VII-553 Cooper along to the Cumberland SCCA National Meeting on 15 May 1955; carrying No 14, he won class F, race No 10 on the programme. On 18 June, Lipe was to be found at the Mount Equinox Hillclimb, where, with start No 28, he took his Mk VII Cooper-Porsche to 6th overall. Then he took victory overall in the race for modified cars, the Clipper Ship Trophy at the Beverly Airport SCCA Sports Car Championship round on 4 July. At the Barclay Airport race in September, Lipe came 2nd in the 1500cc class. Then on 4 September at the Thompson SCCA races, still running the No 28 (it is customary in the USA to keep a race number throughout the season), he finished 6th overall. John von Neumann was, at the time, running the very quick Porsche 550 Spyders, and a contemporary report indicates that the 'Pooper' ran rings round them. Weighing in at just 920lb (417kg), its lighter weight saw it out-accelerate the Werks 550 Spyders (550kg) whenever required, once over 50mph.

Present day: a recent photo of the Lipe Cooper, restored and still going strong at Monterey in the USA. (MS)

George Keck, a top performer of the period, told the author: “Pete Lovely was working for the Seattle Sports Car Company as a salesman and mechanic, which was when he started to be involved, and when he parted with Seattle Sports Car Company to set up his own VW dealership. Tom Meehan was among those who regularly hung out there. It was in early 1954 and we all, including me, got to know, and had become associated with, Seattle Sports Cars, where we built a car we called the Porschewagen.”

♦ ♦ ♦ ♦ ♦

Porschewagen-Porsche

George Keck had been closely involved with Cooper-Porsches from the beginning and was instrumental in creating a version of the ‘Pooper’ sports car for Pete Lovely. But first, as mentioned, Keck and some friends built a ladder-frame chassis mid-engine car. It went under the fairly standard name of the ‘Porschewagen,’ but in fact it

would be the start of the ‘Powered by Porsche’ cars, with new chassis originating in the USA; maybe this was even the very first, because up to this point, it had been only the Glöcklers that had come over to Max Hoffman, or that early Cooper of ‘Tippy’ Lipe. “The Porschewagen project was new, and it started with a frame layout chalked on Seattle Sports Cars’ shop floor!” says George Keck, “Pete was pretty successful with the Porschewagen until it was eventually sold on.”

George, 87, at the time of writing, told the author: “I was involved with design, construction and racing of three Porsche specials. The second ‘Pooper’ was built from one of John Cooper’s two Formula 3 Streamliners, made for Belgian speed record attempts, that we obtained from John Cooper through Johnny Fox of San Enselmo California.”

Ahead of the 1500cc Osca of Al Coppel in this 1954 picture is Pete Lovely in the 'Porschewagen,' a mid-engine car built on a ladder chassis (one of the first mid-engine Porsche specials in the USA). First in class F in the SCCA Golden Gate non-championship race on 6 June. Listed in the results as a VW-Porsche, it was, in fact a Porsche 356 engine in the back. George Keck says: "Del Fanning did the Porschewagen's aluminium body." (Author's note: I suggested to George that it has the look of the Sunbeam Alpine in the UK.) George Keck replied: "Probably more likely Jim Beam than Sunbeam! I recall that when Del volunteered for the effort, he indicated he wasn't much into compound bending aluminium, and that straight line bending (his cup of tea) was the order of the day. Hence the Sunbeam look." (GK)

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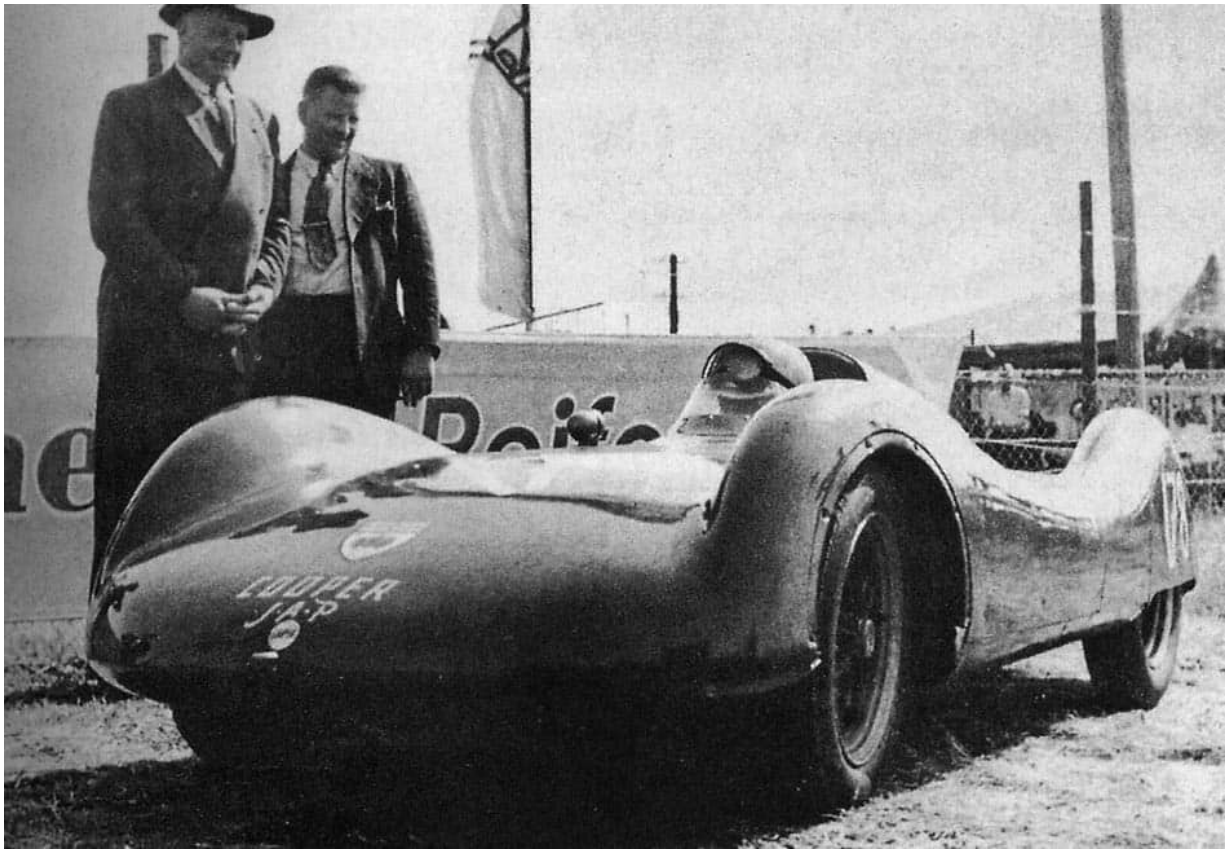
Cooper-Porsche

George Keck says: “Tommy Meehan and I had owned, wrenched and raced Formula 3s early on. Ralph Ormsbee was the third of us to get into Formula 3 back then. I had the ex-Peter Collins JBS that Tommy, Ralph and I drove on a non-stop round trip to San Diego to pick up early in 1954. We gave our little group the name Team Empire. Tommy came up with it from the street where the garage was located in Seattle – Empire Way. Pete Lovely became the fourth member. Over time we all graduated into owning/racing/wrenching/crewing bigger cars. Pete seized the idea to build a sports body car and bettered it by managing to obtain one of Cooper’s Streamliners.” George Keck continues: “We all moved on from racing Formula 3 Coopers. It was Foxy John who provided Pete with a lead he had on one of John Cooper’s two record-breaking Streamliners. Pete in turn snapped it up in order to proceed with his next innovative race car idea. He envisioned the marriage of a Porsche super Carrera engine within the lightweight Formula 3 Cooper framework and suspension found in our Formula 3 cars, then fitted with the streamliner body; he reckoned he could be on a winner. Upon the Cooper Streamliners acquisition, Pete, Tommy and I set about making the conversion a reality. Pete’s eventual racing of her became legendary, capped by winning the 1955 SCCA’s National Class F Championship. Eventually, in January 1957, Pete, Tommy and I formed a partnership, and incorporated it as Grand Prix Motors in the old 3400 Empire Way facility.”



Original Streamliner Cooper, not Porsche-powered at this stage. (GK)

On 28 May 1955, Pete Lovely (No 124) finished 3rd in his class, S1.5, at the Santa Barbara Road Races. Then at Torrey Pines SCCA Nationals in the San Diego Trophy, race 6 on the programme, he pulled off an overall victory in the 1.5-litre+ race. He repeated the performance on 31 July at Seafair Kitsap County Airport Race. At Sacramento, on 30 October, he again took a victory in the Class F (modified) race, repeating the top-spot place at Glendale Airport SCCA on 13 November. In 1956, Lovely started the year with a 2nd place at Torrey Pines on 14 January. The next outing for the Mk8R Cooper-Porsche would be at the 7th Annual Pebble Beach National on 22 April, where Pete Lovely scored a 4th overall. Pete Lovely eventually sold the car to Tommy Meehan.

In 1956, John von Neumann also built a very special car for driver Ken Miles, a super-quick model, consisting of a Cooper chassis

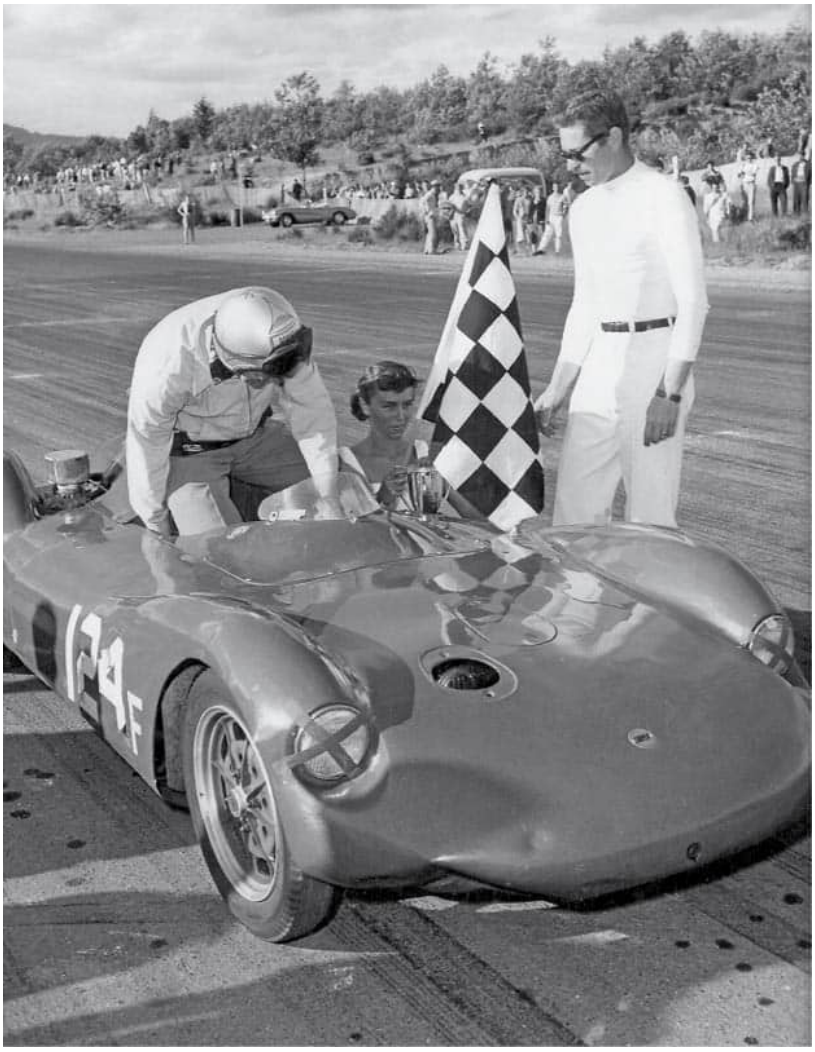
powered by a new quad-cam 550 engine (Carrera), called the Miles R3. It first ran at the Pomona road races on 20-21 October 1956, where preliminary events were followed by a final. Ken Miles was 2nd in class in the preliminary race, and won the class in the final, going on to finish 2nd overall. The next race at Paramount Ranch also saw Miles take the overall and class win. In the 20-lap Governor's Trophy race on 7 December, during the Bahamas Speed Week activities, Miles finished 2nd overall out of 58 starters, ahead of seven Porsche 550 Spyders and numerous Ferrari 500s, winning class F. Interestingly the entry says Cooper-Porsche, not 'Pooper.' He followed this with a class win in the Nassau Trophy race. Into 1957, and at Pomona on 19-20 January, another outright victory came the way of the Von Neumann R3 Cooper-Porsche, Miles driving again. During 1957, the Cooper-Porsche special of Ed Barker appeared, courtesy of Ted Corazza. It finished down the field in the prelim race and did not qualify for the final on the Sunday. Unfortunately, the Corazza Cooper-Porsche fared little better at Paramount Ranch on 15-16 June: a dnf for their troubles. Another Cooper-chassied Porsche appeared at Bremerton on 23 June 1957, the Pooper formerly driven by Pete Lovely, then in the hands of George Keck; listed as a Cooper Mk8R, No 124, it took overall victory.

1955: Pete Lovely (right) with the car he had acquired that would become a 'Pooper.' Left is John Bond from Road and Track magazine. (GK)

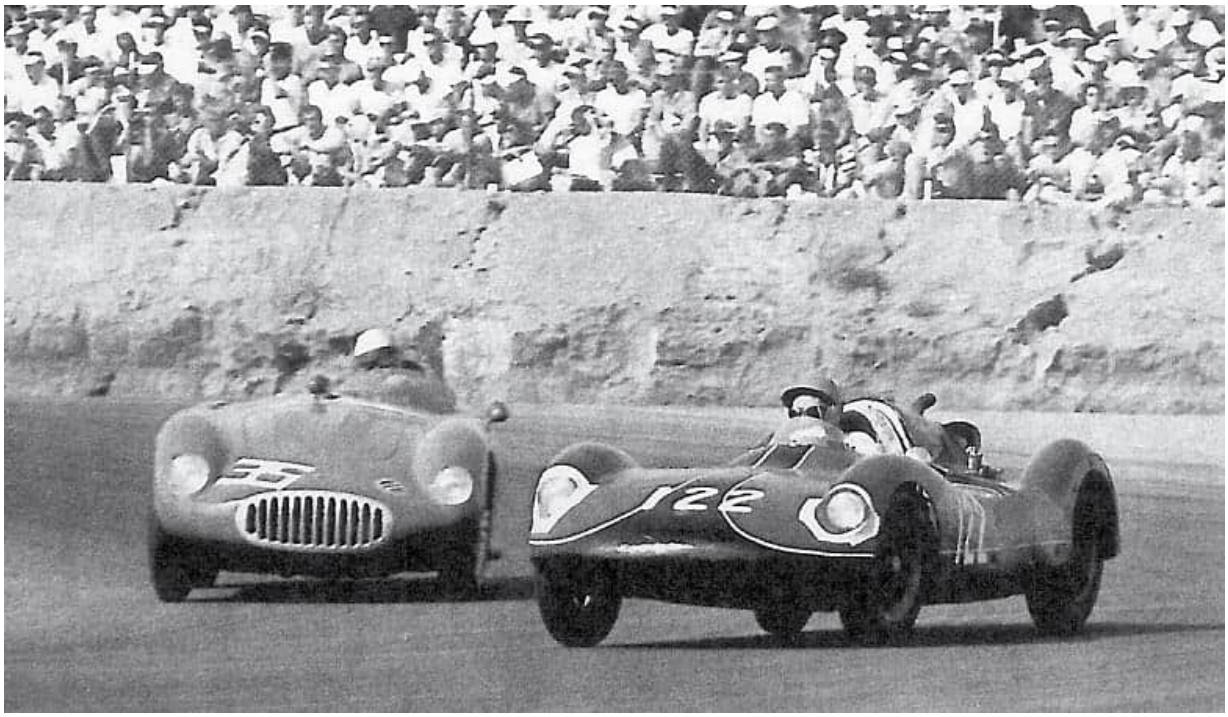
Tommy Meehan goes wide at Riverside. Tommy had acquired the Pooper from Pete Lovely when Pete moved on to driving Fred Armbruster's 2-litre Ferrari TRC. (GK)

At the Nassau Speed Week in 1957, one Harry Jones was entered in the Governor's Trophy; running with No 57, Harry finished 10th overall, and 6th in class. In the Nassau TT he finished 10th in class. In May 1958 at the SCCA Wilmot Hills races, Capt William Cooper appears with a Cooper-Porsche in Class F Modifieds; carrying No 21, he took 2nd overall. Chuck Howard was also in a Cooper-Porsche, having acquired the car from Jack McAfee. At the Vaca Valley Road Races on July 6 1958, Howard was 4th overall, 3rd in class. He was out again with the same car later in the year on 30-31 August, entered in two races, and collected a 2nd in class on both occasions. On 4-5 October he took the car to the VACA Valley SCCA Championship round, recording a 3rd overall and 2nd in class. Laguna

Seca, 8-9 November, was also a great weekend for Chuck, with three podiums in three races.



George Keck: "This was one of the times I got a turn at the wheel of the Pooper that Tommy Meehan and I put together for Pete (Lovely). The girl was Bremerton's Evergreen Queen; standing (in white) is Don Cook, the Starter." The date was 23/6/1957 at the Bremerton Evergreen Trophy race; George Keck won the race in the Cooper-Porsche Mk8R. (GK)



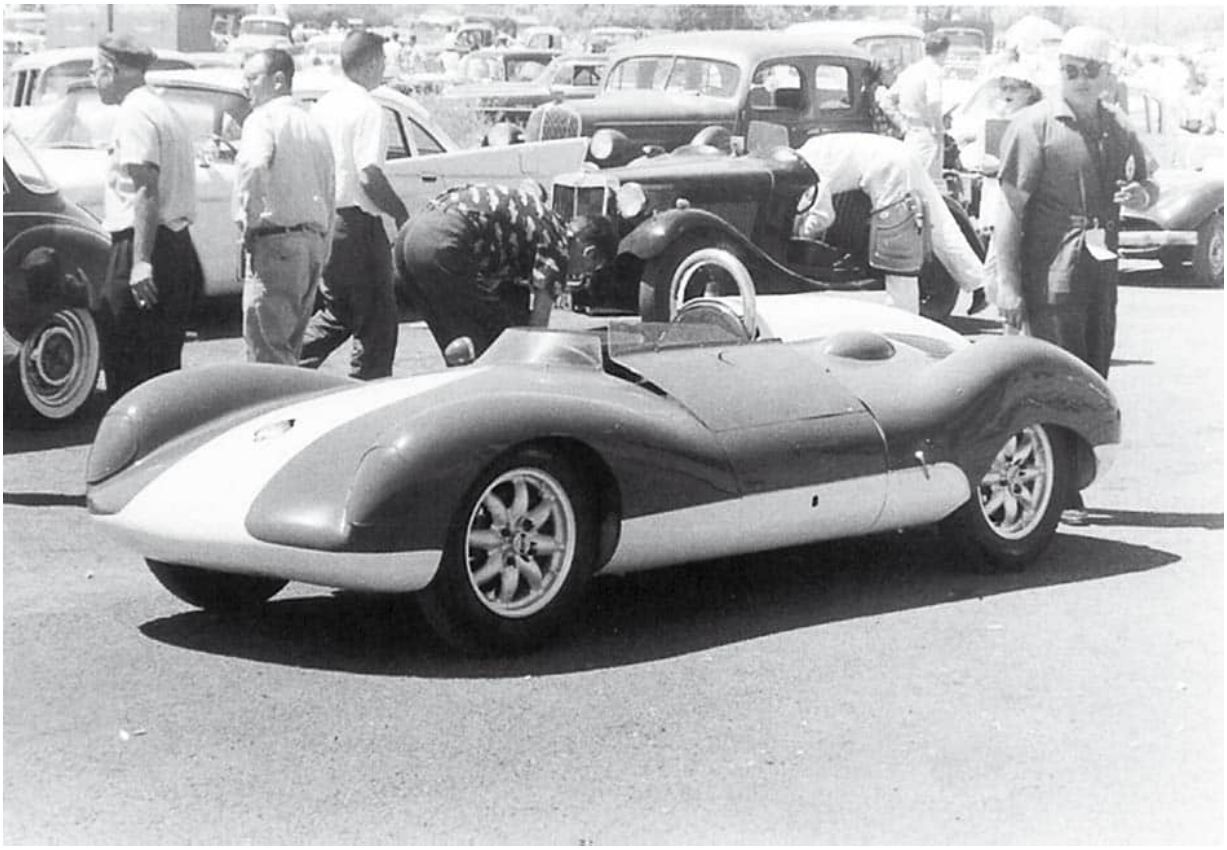
Tom Meehan in the Mk8R Cooper-Porsche No 122 leading Pete Wood's OSCA No 35 at the 1st Riverside US Grand Prix in 1958. (GK)

George Keck: "A meaningful image with close friends pictured on either side of me who are no longer around: Jochen Freund on my right and Frank Becker on my left. Jochen was an ex-Porsche Factory Racing Department mechanic over from Germany. When not helping me, he was a ski instructor in our Pacific Northwest Alps … he lost his life in an avalanche. Frank owned/raced/wrenched the 2-litre 500TRC pictured background." (GK)

George Keck says: “Old stalwart Jack McAfee had stuffed a 1600cc Furhmann quad-cam into a suitably modified Cooper Monaco chassis.” (GK)

The Cooper-Porsches – a few of the performance records:

15/5/55	Cumberland SCCA Class F Modifieds (Gordon Lipe, Mk VII Cooper)	1st ov
28/5/55	Santa Barbara Road Races, Class S1.5 (Pete Lovely, Mk8 Cooper)	3rd in class
18/6/55	Mount Equinox Hillclimb Modifieds (Lipe)	6th ov
4-5/7/55	Beverly SCCA, Sports Car Champ round, F Modifieds (Lipe)	1st ov
9-10/7/55	Torrey Pines SCCA, San Diego Trophy, Race 6 (Lovely, Mk8)	1st ov
31/7/55	Seafair Kitsap County, Race for S1.5-litre (Lovely, Mk8)	1st ov
4/9/55	Thompson SCCA regional race, 1.5-litre class (Lipe)	6th ov
30/10/55	Sacramento California State Fairground Races, Race 4 (Lovely)	1st ov
13/11/55	Glendale Airport SCCA Nationals, Race 4, F modifieds (Lovely)	1st ov
14/1/56	Torrey Pines SCCA Sports Cars, Race 4, S1.5-litre (Lovely)	2nd ov
29-30/9/56	Sacramento California State Fairground Races, Race 3 (Lovely)	1st ov
20-21/10/56	Pomona Road Races, Von Neumann Cooper-Porsche (Ken Miles)	1st in class
17-18/11/56	Paramount Ranch Races, Von Neumann Cooper-Porsche (Miles)	1st in class
3-9/12/56	Nassau Speed Week Governor's Trophy Cooper-Porsche (Miles)	2nd ov, 1st in class
	Nassau Trophy, Von Neumann Cooper-Porsche (Miles)	1st in class
19-21/1/57	Pomona Road Races, Von Neumann Cooper-Porsche (Miles)	1st ov
23/6/57	Bremerton Evergreen Trophy Race Cooper-Porsche Mk8R (Keck)	1st ov
4/8/57	Cotati All Modified Sports Road Races, RS Keck Pooper (McAfee)	4th ov
4/8/57	Cotati All Modified Sports Road Races (McAfee)	4th ov.
24/7/60	Vineland SCCA Regionals Cooper-Porsche Special (Brad Howes)	1st ov
4/9/60	Thompson SCCA Nationals Cooper-Porsche (Howes)	10th ov, 2nd in class
1/7/61	Lime Rock SCCA National Cooper-Porsche T39 (Jennings)	3rd in class
29-30/7/61	Seafair Pacific Raceway Cooper-Porsche Mk8R (Steffan)	1st in class
3-4/9/61	Thompson SCCA National Cooper-Porsche T39 (Jennings)	2nd in class
10/9/61	Vineland Philadelphia SCCA Cooper-Porsche T39 (Jennings)	1st in class



The Cooper Monaco-Porsche of Jack McAfee. (GK)

Keck RS-Porsche

George Keck had acquired another race car, purchased from Jean Pierre Kunstle, Porsche Chassis 0104. Unfortunately the car got damaged during delivery and required a rebuild. That rebuild became the 'RS Keck.' George Keck says: "It was extensively lightened, and received a special body created by San Francisco Bay constructor Nadeau Bourgeault. The donor car was originally the Kunstle/Miles 1957 Sebring No 45 Porsche RS, that they successfully drove to 9th overall and 2nd in class. I was given to understand that while being trailered the car had experienced a roll-over. You can guess what the body looked like when roughly straightened. In any event, I traded JP (Kunstle) the 1956 550 Spyder (Serial P90069) I was also racing at the time. I picked 0104 up at von Neumann's in LA from Rolf Wütherich (the Porsche mechanic ref James Dean) and Vasek Polak, who were looking after the pieces (the pieces being a car with

misshapen body, engine in boxes with new essential parts … and a new later-model five-speed gearbox that didn't fit the existing tubular frame structure). Upon returning all to Seattle, I set about re-engineering what lay there before me. First, the poor example of a repaired body was stripped away, then the tubular frame was modified to accept that later model five-speed low pivot axle gear box. The steering was re-oriented and the fuel cell was outboard of the frame (passenger side), with the spare tyre forward (where the tanks had been)."

The RS Keck, George aboard, leads Chuck Howard in No 238, a Cooper-Porsche 1600, at the Laguna Seca Road Races, 8-9 November 1958. Chuck had recently acquired the car from previous owner Jack McAfee. (GK)

George Keck's newly built Nadeau Bourgeault-bodied RS Keck Porsche special. (GK)

George Keck: "The car was barely finished in time for the first running of the LA Times GP at Riverside in October 1958." (GK)

George Keck again: "The car was barely finished in time for the first running of the LA Times GP at Riverside in October 1958. Nadeau was especially concerned about the adequacy of cooling. Porsche factory reps that visited Nadeau's shop to see the RS Keck commented that engine cooling provisions were inadequate. They convinced Nadeau to the point that he fashioned air scoops at our Riverside motel the night before qualifying, but held off installing to 'wait and see' at my insistence. Engine cooling turned out just fine, while others experienced cooling bothers in the 105˚ heat!

"Quite frankly, we were quite elated that the car finished, considering this was her first time out … (a lot of well-seasoned vehicles didn't). From there on, unfortunately, it was uphill … As Tommy Meehan would say, 'She ran like a runny nose.'

"The RS Keck's racing history while I owned and drove her (as I recall) follows:

1. 1st running: Times Mirror US GP Riverside, 12/10/58, 19th ov (4th in class)

2. Shelton SCCA Regional,19/10/58, 1st ov
3. Laguna Seca, 19 /11/58, 6th ov (2nd in class)
4. Shelton SCCA Regional, 15/3/59, dnf (shunted by Pete Lovely's sliding Lotus Mk15)
5. Shelton SCCA Regional, 19/4/59, 1st ov
6. Forest Festival Shelton Regional, 24/5/59, 2nd ov (2nd in class)"

The author is greatly indebted to George Keck for these words of wisdom, which take us back to the real time of the Poopers.

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Sauter-Porsche

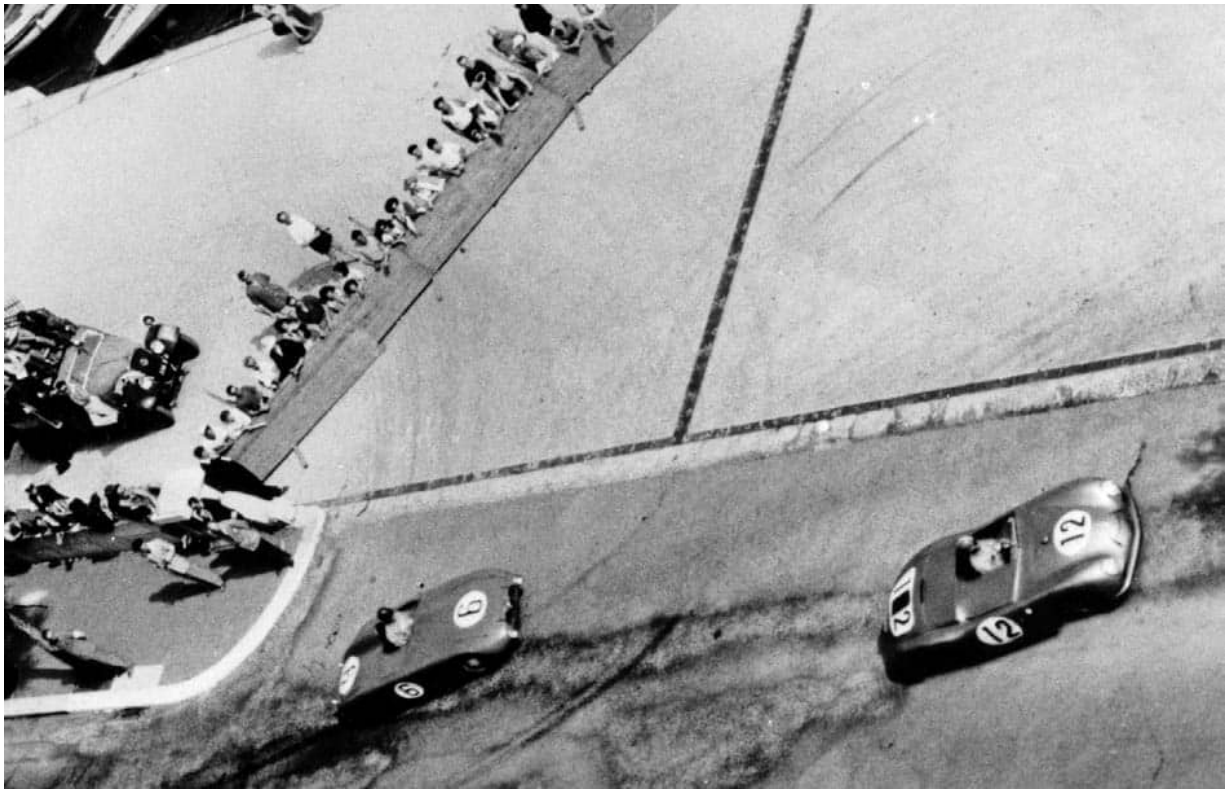
Heinrich Sauter was looking for a sports car to go racing. The new Porsche 356, which only became available to the public in 1950, looked to be the answer. But it is said that Mr Sauter thought the car to be too heavy, and decided to see if he could get a lighter-weight body for the car, whilst keeping the excellent 356 chassis in place. Now hang on, the reader might think, is this a Porsche chassis? But in the early days, that was the starting point. Heinrich Sauter reportedly said in 1981, that actually it was Hans Klenk who modified the chassis and made the lightweight body in his Boblingen workshop during the winter of 1950-51. If the name Klenk is familiar to some, it may be because he was to be the co-driver with Karl Kling in the Carrera Panamericana-winning Mercedes Benz of 1952.

The Sauter-Porsche, with a modified chassis and a replacement lightweight body by Hans Klenk, 1951. (P)

Sauter was based in Stuttgart, where he was heir to the Hahn Kolb machine tool company. He had started racing post-WWII in a Veritas. But due to his being in Stuttgart, and as a supplier of machine tools, it was inevitable that he would be in contact with Porsche. This led to acquisition of one of the early 356 chassis. This was taken to Klenk's small body shop, where, with help from Porsche, a new lightweight low-slung sports racer was created.

The engine featured a tuned 1100cc engine taken out to 1300cc. The shape of the body of the Sauter, and that of the so-called 356 American Roadster that came along around that time, shows evidence of some collaboration between Erwin Komenda, the Porsche designer, and the work of Klenk. It is recorded that the first Sauter took around six months to build, and was first raced at the Nürburgring in 1951, painted white. It also ran in the Liège-Rome-Liège Rally of 1951 in the hands of Guillaume/Muhle, and it is suggested that by then the 1300cc engine had become an experimental 1500cc, a development unit from Porsche.

1951: the first special-bodied Sauter-Porsche, featuring an ultra-thin steel body, front-opening doors (often called suicide doors) by Klenk; the Porsche engine was modified from the standard 1100cc to 1300cc. (P)



Monaco Grand Prix weekend 1952: the No 12 car is the Sauter of François Picard. It was not successful, lasting only to lap 3 of the 65-lap sports car support race. (P)

The Sauter was not a particularly successful car, though; the already studied Glöcklers were way ahead in terms of development. That first Sauter was sold to Frenchman François Picard, who took it to race at one of the sports car events at the Monaco Grand Prix weekend of 1952; however, it is recorded that it only lasted for three laps! That year the Grand Prix itself was held for sports cars on 2 June. The records also show that Heinrich Walter entered a KS 11 Sauter at the Ollon Villars hillclimb on 26 August, where he is listed as finishing 4th in class. Heinrich Sauter is said to have competed a few times himself, including on the Tour de France Auto and 1952 Moroccan Rally (though the author has not found the car listed in the final classement). It is said that the front-opening doors were to assist in the speedy exit of the co-driver in rallies to get cards stamped, a feature of the control points in those days, where every fraction of a second counted in getting from the car to the end-of-

stage control point and stamping machine to record the time on the team's record card.

At the Avusring Grand Prix Sports Car Championships on 16 September, the Sauter would finish 10th in race 9, while on 29 September Herr Walter took the Sauter-Porsche to victory at the Basel ACS Hillclimb Championship.

That early car was then sold and shipped to the USA in 1953 to be raced by one Stan Mullin, a lawyer from Los Angeles. From the archives in Porsche at Stuttgart, we are able to see that Sauter had a second car built with a more streamlined body. The car was still in existence in 1957, being driven by Swiss Peter Liechti at the Schauinsland Hillclimb Grand Prix.

1956: a new super-smooth-bodied Sauter, the work of Hans Klenk again. The driver is successful hillclimber of the time, Heini Walter. (P)

Photographed in 1957, this is the Sauter Special; the legend on the back of the photo states that an 1100cc Porsche is installed. The Klenk/Sauter body, seen here at the Schauinsland Hillclimb Grand Prix, was being driven by Swiss Peter Liechti. (P)

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Poll-Platje-Porsche

In keeping with many 'specials' builders of the 1950s, one Wim Poll, the son of a Volkswagen dealer in Hilversum (Netherlands), decided to create a sports racing car. Using what is thought to be the Type 589 Super 1300cc engine from the Porsche 356, it saw the light of day in 1956. So successful was this car that Poll was Dutch champion on several occasions. It was a mid-engine car, in keeping with the thinking of Glöckler and Porsche, and utilised a VW swing axle and a tube-frame chassis that weighed in at an astonishing 45kg (99lb). The Platje utilised a 28-litre (6 gallon) fuel tank located in the nose of the car. The complete car weighed 400kg (880lb). Wim Poll was getting 67bhp at around 6000rpm, giving it a maximum speed of around 125mph (200km/h). The four-speed machine was so successful that Porsche decided to offer Poll a Type 616 1600cc engine, which helped to extend the winning ways of this remarkable little car.

The Poll-Platje 1300cc mid-engine race car (74), driven by Wim Poll, would win many races and come out number one in several championships in the period. (RP)

Featuring a VW swing axle and a tube frame chassis that weighed only 45kg (99lb), the Poll car came to the attention of Porsche, which decided to offer Poll a Type 616 1600cc engine; this extended the winning streak of this remarkable car. (JB)

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ATAF Porata-Porsche

In 1957, Jan Deken, owner of the 'Amsterdamse Trailer – en Aanhangwagen Fabriek' (the ATAF kart, built at the end of the fifties), purchased one of the first Porsche Specials built by fellow Dutchman Wim Poll. It was fitted with a VW front axle and a Porsche 1500 Super engine. Jan Deken modified this car heavily, transforming it into a mid-engined car, and designing a completely new, tubular chassis and an aluminium body made by Theo Jansen in Santpoort. The resulting car was named Porata (a combination of the names Porsche and ATAF, the company that built the ATAF kart at the end of the fifties). Driven by Jan's son (also called Jan) from 1958 onwards, the car was also road legal. The engine proved unreliable, however, and was replaced by a 1300cc block, before that was changed for a Super 90 engine, with which the Porata won a number of races at Zandvoort until the end of 1960.

The ATAF Porsche 1500cc Super-powered Porata, seen here at Zandvoort in 1958. (MK)

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Hirondelle-Porsche

Post World War II, Britain, the USA, and most of Europe were a hotbed for new ideas, and by the mid-1950s many home-brewed specials were appearing. In Holland, as with the Poll-Platje, being in mainland Europe gave access to many components and creative ideas. Henk van Zalinge was a Dutchman with ideas who set about creating a car he would call the Hirondelle (swallow). It was a front-engine sports car with several unusual features, and so worthy of inclusion here over the many one-offs that were being made in back gardens everywhere in the early 1950s.

The Hirondelle was of tube-frame construction, and was fitted with a 1.6-litre Type 692 Porsche 356 Carrera engine. In this car it was located ahead of the driver, as opposed to behind, as in most other cases of the use of this engine. Its suspension and other mechanical components come from the ubiquitous VW Beetle and featured

extensive use of rubber for shock absorbing.

Mark Koense told the author: “Wim Poll (see the Platje) and Henk Van Zalinge both lived in Bussum, and briefly joined forces under the banner Ecurie le Houchet; the Dutch motoring press referred to Bussum as ‘little Modena.’ The first Hirondelle (initially called the HVZ Special) was financed by Dutch amateur racer Hans Tak and built in Henk’s workshop at the Jacob Obrechtplein in Amsterdam (the Speedshop, which he owned with John Schwaab). The car’s body was made by Rijnplaat from Leiden and the RS-engine came from a Porsche RS 550. First an MG-gearbox was installed, but that could not handle the engine’s power and was duly replaced by a Porsche gearbox.

“Both Hans and Henk raced the Hirondelle Porsche in national events from 1955 onwards, before Hans built a second, DKW-powered Hirondelle for 1957. Both the DKW- and Porsche-powered Hirondelles participated in the Bleriot race from London to Paris in 1957 and the Porsche-powered car was also frequently raced by the legendary Rob Slotemaker in the late sixties before a young Gijs van Lennep used it in 1963/64 in several events at Zandvoort. A second DKW Hirondelle (the third Hirondelle) was aluminium bodied at Vermeulen in Haarlem and built for a client named Jan Bootz, who sold it on to Hans Alofs before it was completed. A fourth Hirondelle sports car was built in 1960 for German Bruno Runte. This car, made for hillclimbs, was rear-engined and fitted with an RSK-engine.”

It is recorded that Rob Slotemaker won the Zandvoort World Cup sports car race on 5 July 1959 in the Hirondelle.

Henk van Zalinge's Hirondelle: a superlight chassis, it had its Porsche engine installed ahead of the driver. (JB)

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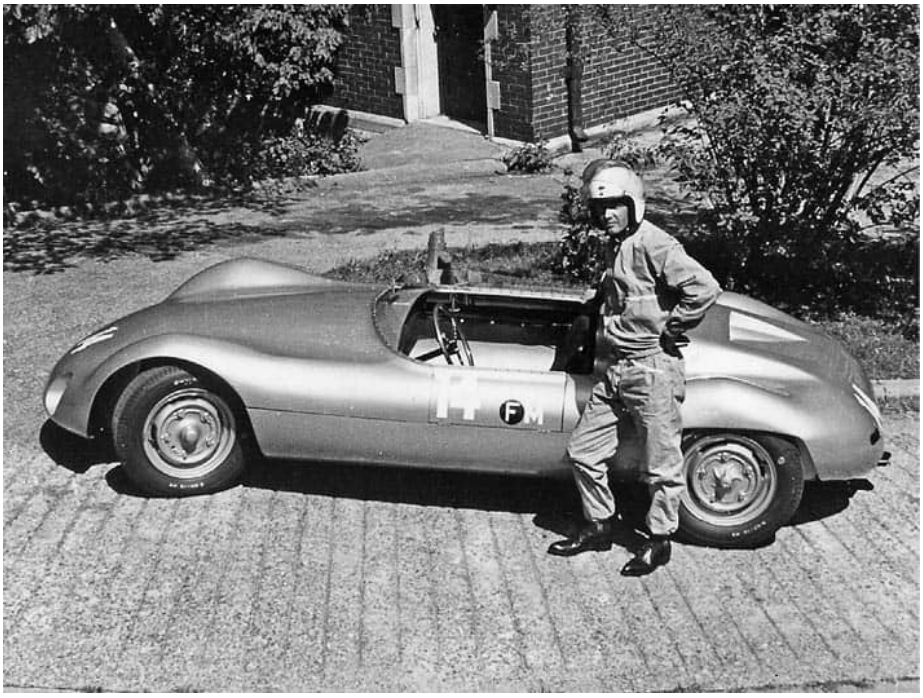
Mong-Porsche

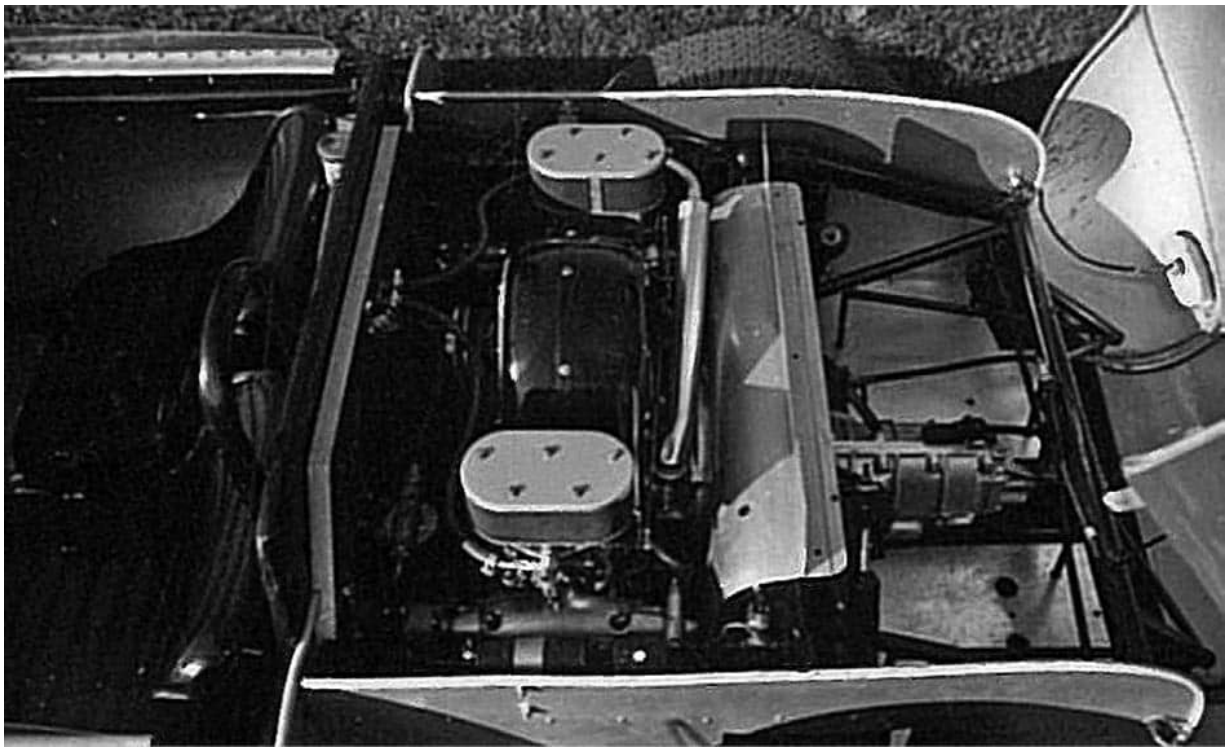
Whilst most 'special' builders make just one or two, or at the most perhaps three or four cars, Gerry Mong would stand out like Elva or Lotus as a production manufacturer building more than 100 race cars. Starting in 1958 with the first Mong in his Medina (Ohio) workshop, he went on to create the Bobsy racing cars (which we will read about shortly) and formed the company Vanguard Industries, designing and building more than 100 Formula Vs. His son Ronald Mong continues restoring his father's older cars and building cars of his own today. We, of course, are interested in the early Porsche-powered examples, and start with the original Mong.

The car has a steel-tube chassis, and again a mid-engine layout with an aluminium sports racer body. Initially the Mong was powered by a Porsche 1600 Type 616 356 engine, mated to a 356 transaxle gearbox. The car would be the prototype for the better known Bobsy, sometimes referred to as the Bobsy-Porsche Spyder, running with the aforementioned pushrod Porsche engine while Gerry Mong developed it. He was to sell that first Mong right after the Cumberland National Races in May 1961 to one Floyd Sable.

Gerry Mong at the Cumberland National Races – an important race that included the likes of Bob Tullius – before he sold the car to Floyd Sable. (TM)



Floyd Sable went to Porsche and bought a Fuhrmann Carrera four-cam Type 547 motor to install in his newly-acquired Mong. (TM)



Today, the Mong has been restored; here we see the installation of the Fuhrmann Carrera quad-cam, twin-ignition engine. (TM)

The car still exists today and is owned by Tom Miller of Tom Miller Racing Cars, to whom we are indebted for the information. The car is seen here recently at Pocono; the paint is from around 1969. (TM)

Gordini-Porsche

To many the name Gordini will be familiar; others may ask “Who?”. Amédée Gordini was a very famous naturalised French driver (he was born in Italy) and manufacturer of racing cars who later tuned Renault road and race cars. Whatever your knowledge of the man Gordini and his cars (the full story can be read in this author’s work *Amédée Gordini – A True Racing Legend*, published by Veloce), it is sure that in the postwar period he was highly respected in his adopted home, France. This car, the Gordini-Porsche, is one of the most unusual cars to be fitted with a Porsche engine. In the 1950s, Gordini was a recognised force in the world of Formula 2 racing. All his Formula 2 cars carried the letters GC. This car is GC15, and it started life as a Formula 2 single-seater racing car in May 1949,

fitted with a 1490cc Type 15 Gordini engine. Its first race, though, was not until a year later. It had been acquired by one Viscomtesse Madame de Walckiers, owner and driver of race cars in the period. She entered the Swiss driver Anton Branca in GC15 for a Formula 2 race at Erlen, Switzerland, on 7 May 1950. Branca did quite well, finishing 5th overall. But this was only the beginning. The Gordini Type GC15 went on to compete in no less than 20 more races from 14 May 1950 to 29 January 1956. Its most frequent drivers were Anton Branca, Johnny Claes and Georges Berger, though the great Maurice Trintignant took the wheel at the Italian Grand Prix at Monza in 1950.

Gordini GC15 at Silverstone, 19 July 1952, where it finished 14th overall in the hands of the Belgian Claes. (RS)

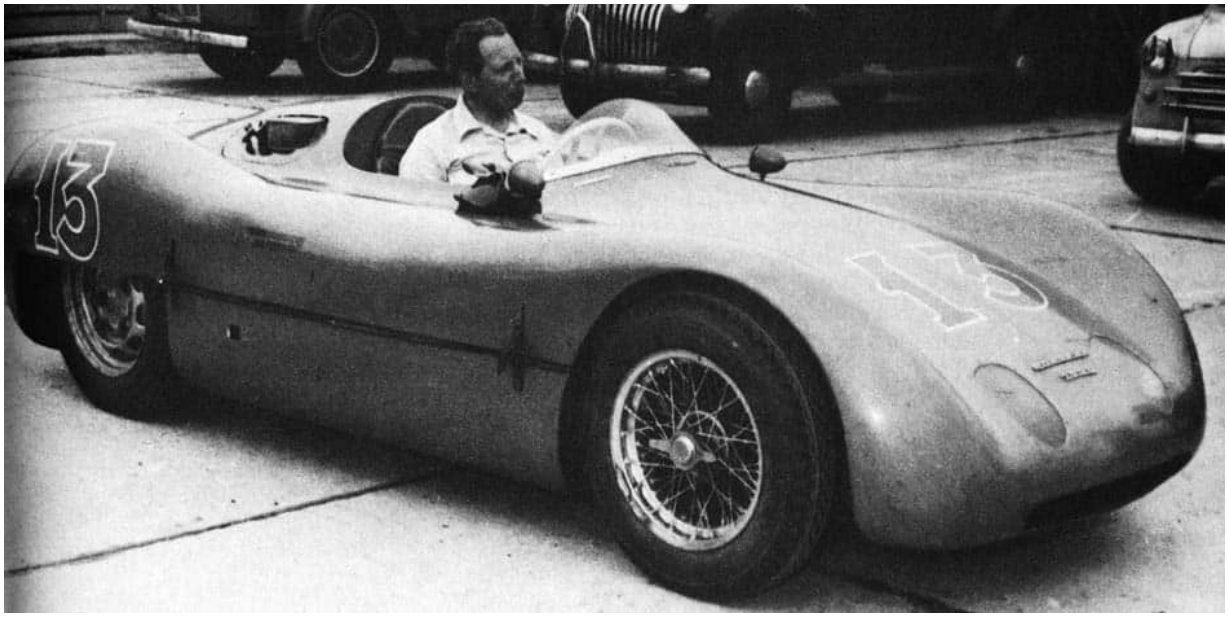
At around the same time, racing fan Kurt Delfosse was racing in Germany in an unusual racing car known as the DVD (Delfosse Versuch Düsseldorf). Built in 1947, and running a Zündapp 500cc motorcycle engine, it was known as the 'Flying Saucer.' This is worth

mentioning, because it demonstrates a wish on the part of Mr Delfosse to be innovative. He came from a reasonably wealthy family that built cars and planes. Kurt Delfosse moved to Argentina in 1951. The car moved from the ownership of Madame de Walckiers to Georges Berger, and eventually also found its way to Argentina, but without its engine. This was in 1953, following a dnf by Berger in the Formula 2 Grand Prix of Spa that year on 21 June. Delfosse acquired the chassis in Argentina, and also a special Porsche 356, believed to be with a Fuhrmann Porsche Carrera engine of 1500cc installed. He set about creating a sports car body for the Gordini chassis during 1954. He called it the Gordini-Porsche.

Delfosse's first race is recorded as the 1000km of Buenos Aires in 1955, though the car may have raced earlier. He completed the distance, but was not classified. Shortly after, it is said, he carried out further modifications of the bodywork, as we see here, but whether this was due to accident or by design is not known. The car appeared with modified bodywork on 8 August 1955 at the El Bosque circuit in La Plata, finishing 4th, but dnf'd at Tres Arroyos on 11 September. He ran the car again in several more races during 1955, and the 1956 Buenos Aires 1000km; once more he completed the distance, but was disqualified because he was pushed over the line at the end with outside help. It is said that he ran the car once more at the 500-mile Rafaela in Argentina on 14 May 1958, and finished 9th overall. It is also recorded as being raced by Delfosse, with further revised bodywork and a new 550 engine, at the North Riverside Road race on 26 April 1959, and at a handicap race in Buenos Aires on 10 January 1961. Delfosse was still using the car in 1968 when it ran at the Buenos Aires Autodrome in the Autumn. There is no record of what happened after the car was last seen racing in Argentina, but in recent times a car said to be the GC 15 Gordini Porsche came up for sale at an auction in Belgium. The author has not been able to establish its whereabouts at the time of writing. Of Kurt Delfosse we know a bit more. His name now changed to Curt, he raced a 550 RS Spyder Porsche during 1957, and it is recorded that in 1960 he was racing a 718 RSK. He also designed a series of NSU-twin-cylinder Prinz-powered single seaters for the Formula 3 racing class during

the 1960s. He later moved to the USA.

Kurt Delfosse in the Buenos Aires 1000km on 23 January 1955; he completed the distance, but was not classified. He would, however, finish 4th in the National El Bosque on 14 August 1955 but dnf'd in the National Tres Arroyos on 11 September 1955. (P)



Possibly Kurt Delfosse in the Gordini-Porsche in Buenos Aires 1000km, 1956. (His race number, however, was 3, not 13 – so there is some question about this image). Though the bodywork is correct for that race, Delfosse/Escudero failed to finish, disqualified for outside assistance. One of the filters atop of the Porsche engine is clearly visible in the rear. (CH)

♦ ♦ ♦ ♦ ♦

Fageol-Porsche

As this is a work mainly about racing cars, the Fageol nearly didn't make it to our line-up. But in fact it deserves to be here for sheer ingenuity alone, and it is certain that the Fageol also raced. Its creator was president of the Twin Coach Company, a bus manufacturer: the passionate power boat racer, Louis J Fageol, an American who also loved fast cars. Owning an engine manufacturing company meant that resources were abundant. He reasoned that, because cars at the time (1952) normally had engines in the front, and Porsche had an engine the back, why not build a car with an engine in the back! First he modified a 356 in this fashion, but it wasn't successful. He built a new car for 1953, complete with two Porsche Type 528 1.5-litre 356 Super engines of 1488cc, said to be giving 72bhp each, giving a total output of around 144bhp. One

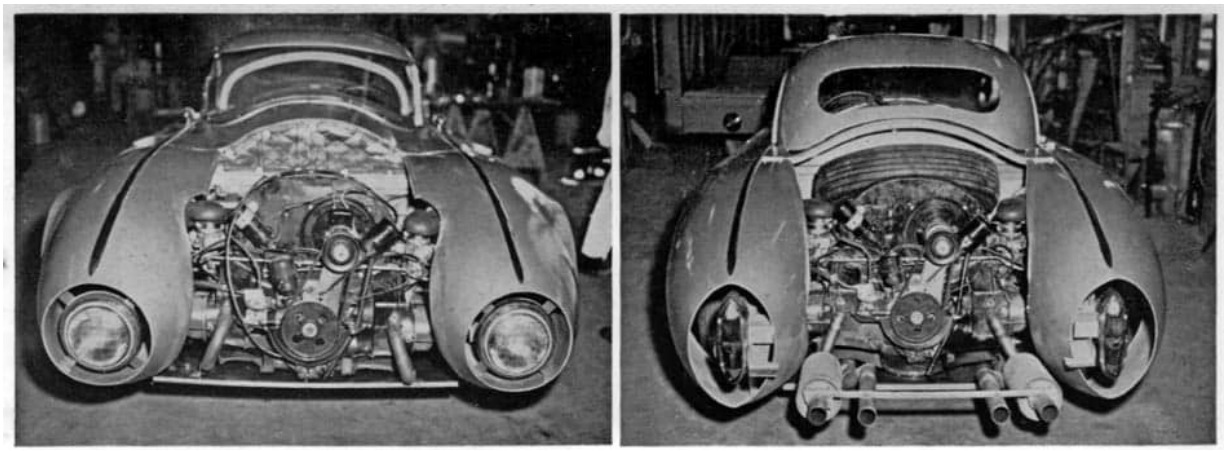
engine was located in the conventional Porsche position, with the second one mounted forward of the front wheels. *Porsche Panorama* in July 1985 told the whole story, of which we can only include a little here.

The idea for the twin-engine set-up came from his 1946 Indy car, which had two Offenhauser engines. It looked like causing a sensation when driver Paul Russo put it on the front row of the grid for that 1946 Indianapolis 500, but hopes were dashed when it went out after just 10 laps. Fageol then went on to build the Fageol Special twin-Porsche-engined car. The front and rear engines shared a common throttle, clutch mechanism and gearshift. For Fageol, however, it wasn't enough; he wanted to go racing with it, and so set about installing superchargers. Several superchargers were tried, first a McCollough (later Paxton Blowers); then he went to Rootes Superchargers. Of course, Fageol Industries was pretty ingenious, and eventually he settled on twin McCollough superchargers, but not belt-driven as normal. He installed two tiny but powerful chain-saw engines to drive the superchargers, thus removing any loss of bhp by belt driving, and avoiding any belt slipping. The car ran at first without supercharging in the SCCA D Modified sports racing class, then in the C class and B class Modified, with supercharging that pushed the power output per engine up to nearly 100bhp. Fageol raced the car in 1954 at SCCA regional events at Cumberland (Maryland) on 16 May, Columbus (Indiana) on 39 May, where he finished 3rd overall behind two Ferraris. On 13 June at Westover Massachusetts, he dnf'd. On 18 September he raced at Watkins Glen Grand Prix, carrying No 73, and finishing 10th, the race winner being Phil Walters in one of Briggs Cunningham's C4R racers.

In 1955, with the engine and superchargers further improved, he raced at SCCA National at Fort Piece, Florida, on 27 February, where he was to finish 5th overall and 1st in Class B in the 150-mile race. However, the Fageol story of racing with twin supercharged 356 Super Porsche engines was to end at California's Pebble Beach Monterey circuit, when he lost control and flipped the car, damaging it severely. It was eventually converted back to a road car.

Lou Fageol (left), with Max Hoffman. (P)

8 August 1953 at Payne Airforce base, Everett, Washington: the Fageol, still being sorted at this event, the Seafair sports car races. (Revs)



The two 356 engines installed in the Fageol. It is said he eventually installed two tiny but powerful chainsaw engines to drive the superchargers, thus removing any loss of bhp by belt driving, and avoiding any belt slipping. (JS)

♦ ♦ ♦ ♦ ♦

Devin-Porsche

The name Devin may not be too familiar in Europe, but in the USA, Bill Devin and Devin Enterprises are very well known. Devin Enterprises Inc was based in El Monte, California, in the 1950s and ’60s. Bill Devin set about providing exotic-looking cars without the cost of a Ferrari or Maserati. At first, he built bodies to clothe chassis from a number of marques – Triumph, Alfa Romeo, Corvette, MG, Austin Healey, to name just a few – and, of course, quite a few 356 Porsches. Whilst Devins were not exclusively race cars, they deserve a small mention, even though they were mostly special bodies fitted onto proprietary chassis, like the 1956 SCCA National Champion which was a Devin-bodied car. The interesting part for our work here is that in 1958 Devin moved away from using proprietary 356 chassis to making his own tube-frame models called Devin Ds. Only a few were made, but they were raced on many of the smaller tracks in the USA in the late 1950s; Devins ran in 136 SCCA races between 1955 and 1963, coming 1st 32 times, 2nd eight times, and 3rd three times.

The Porsche power unit in today’s reconstructed Devin of Gregory Campbell. (GC)

Gregory Campbell's No 356 Devin at the Rennsport Historic Meeting 2015. (GC)

♦ ♦ ♦ ♦ ♦

Pupulidy-Porsche

This pretty little car is the work of one 'Pup' Pupulidy, or to be more respectful Emil Pupulidy, and was created in 1953. Emil Pupulidy's story deserves a book in itself; suffice to say here that he arrived in the USA before World War II, escaping the ravages of the Hitler era. He joined the US forces, becoming a combat engineer, returning to Europe with the US Army. Post war, he entered the aviation industry then set up a company producing stained glass windows. He was to make a return trip to Europe, this time on peaceful terms. During the trip he visited the fast-expanding Porsche works, where it is said he bought a brand-new Porsche 356. Returning to the USA, he went on to win the SCCA G-Production National Championship.

However, it is said that Pupulidy wanted to make a 'special,' and his chance came in 1953, when a delivery of Volkswagens to a dealer

saw one of the cars fall off the car carrier. The damaged vehicle was returned to distributor Max Hoffman (of whom we have already heard) in Manhattan; Emil Pupulidy did a deal with Hoffman and took ownership of the Volkswagen. Pupulidy stripped the car, dumping the bodywork. He shortened the floorpan and began to design a replacement body to be made of the then-new product, glass fibre. The mould shape came from using a wooden buck he'd nailed together and shaped in the basement of his house. Early glass fibreing skills were limited then, and the result was a heavy body! A second attempt delivered a lighter-weight version.

The restored Pupulidy as it is today, seen at a recent Goodwood Festival of Speed. (PA)

The Pupulidy-Porsche at the Laguna Seca Rennsport Meeting in 2015; in the background is a Cooper and a Bobsy. (MS)

We see an entry for a VW in the name of Pupulidy at the Bahamas Speed Week in 1954 for the 'straightway' speed trials, race No 76, where it is thought it unfortunately failed to do anything. The car was entered in the race where the aforementioned Herbert Linge finished 3rd in a Porsche 550 with a terminal speed of 121mph. There is, though, no time recorded for car 76, the Pupulidy. However in the five lap heat classes E, F and G on 11 December, Emil Pupulidy is recorded as finishing 2nd in class G and 12th overall. In its second race, the Bahamas Automobile Cup on 11 December over 30 laps, totalling 105 miles, Pupulidy was 24th overall and 2nd again in class G. In its third race on 12 December, Pupulidy was 16th overall, and this time 1st in class G in the Nassau Trophy Race. It is then said that in 1955 Pupulidy created an aluminium tube-frame chassis and a streamlined body similar to that seen today. Named Pup 1, its power unit was of Porsche origin. It is also said that it was sold, but never raced. Pup 1 was found in 1958 by one Butch Strunk. It was purchased, renovated and raced on the circuits and hillclimbs of the

northeast USA. Acquired sometime during the 1960s by SCCA man Howard Gilmore, who was to keep the car for over 20 years, it was sold on in 1988, and its racing career continued with John Müller in 2003; since then it has been a regular at Rennsport reunions.

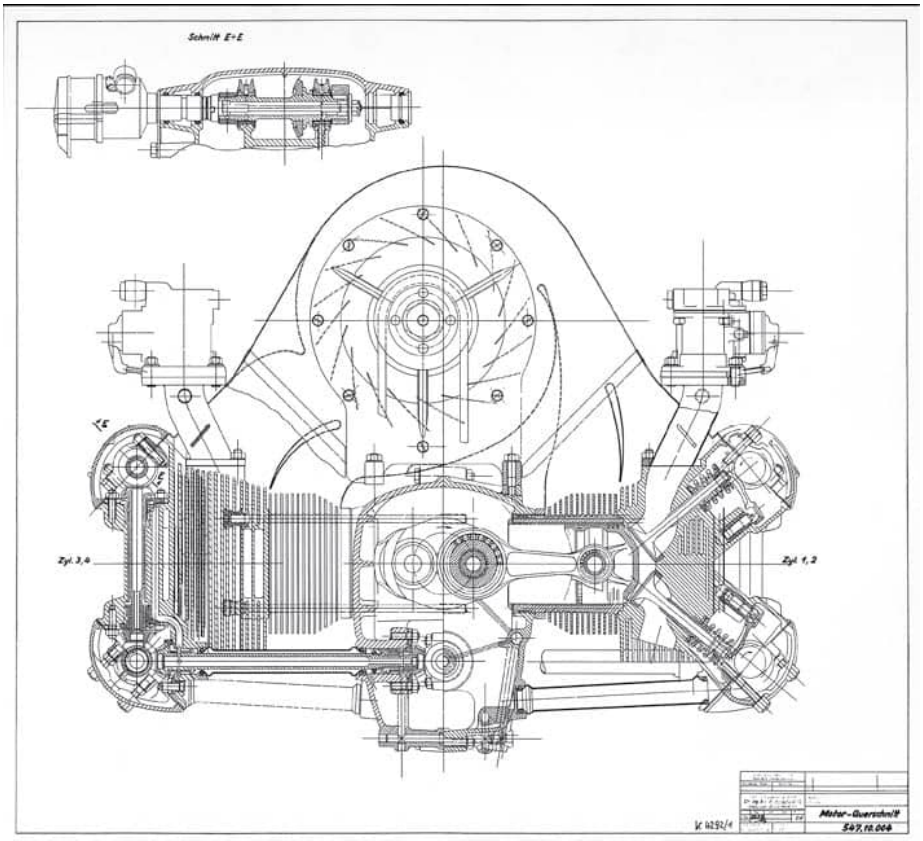
Today the engine is a 1954 Porsche 356A OHV four, aluminium block and cylinder heads; 1720cc (taken out from 1600cc); bore x stroke: 82.5 x 74mm; compression ratio: 12.0:1, giving 150bhp at 7000rpm. Two Solex 40 PII downdraft carburettors are fed by a Holley electric fuel pump. It has a wet-sump lubrication system. The gearbox is a Porsche 741 four-speed manual. The steering is VW; the brakes are 356A with finned alloy drums. It has the style of a centre-seat driving position with a mid-mounted engine. It weighs in at 1200lb (544kg). The estimated top speed is given as 160mph (257km/h).

The 356 engine in the Pupulidy is installed behind the driver in a mid-engine position. The car weighs in at 1200lb (544kg). (PA)

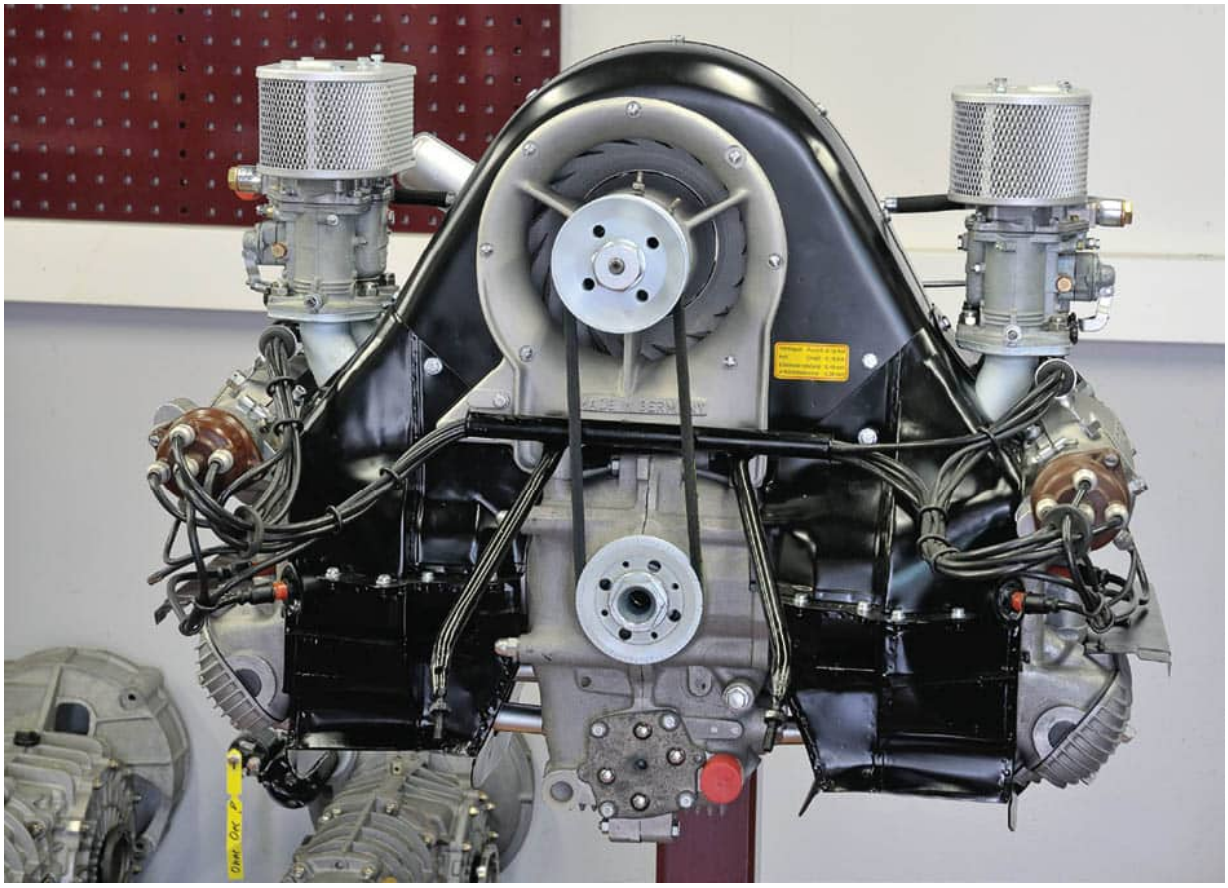
At this point it is interesting to take a look at the engines developed by Porsche during the 1950s:

Year	Type	Cyls	cc	Cars	Power	Notes
1948	356	Flat-four	1131cc	356 001	40hp	Mid engine first car. Proto
1949	369	Flat-four	1086cc	356 2	40hp	Rear engine, Solex carburettor. Development and demonstrator car capable of 85mph
1950	369	Flat-four	1086cc	356 3	42/49hp	New cylinder head design. 49hp was reduced to 46hp for the 1951 Le Mans
1951	506	Flat-four	1286cc	356	45bhp	Development still using two Solex carburettors.
1951	369	Flat-four	1093cc	356	55.5bhp	Engine for the Liège-Rome-Liège race 1951, Solex carbs again. Cars capable of over 100mph
1951	369	Flat-four	1093cc	356	67/72bhp	Ernst Fuhrmann developed. Revving to 5100rpm
1951	502	Flat-four	1488cc	356		Engine design started in 1950; it would be introduced in 1952.
1951	502	Flat-four	1488cc	Glöckler	85bhp	Glöckler/Ramelow developed unit that would rev to 6200. A racing engine.
1952	506	Flat-four	1286cc	356	49bhp	New development with Bosch fuel-injection pump. Not put into production due to cost
1952	527	Flat-four	1488cc	356	60bhp	Engine now fitted with larger Solex 40 PBIC carbs (engine also available with smaller Solex)
1952	528	Flat-four	1488cc	356	70bhp	5000rpm in the originally exported to USA model 356 Super
1952	546	Flat-four	1488cc	356		A longer stroke, plain bearing engine that would have a steel crankshaft
1953	369	Flat-four	1093cc	356	67bhp	Ernst Fuhrmann developed, engine running on alcohol
1953	547	Flat-four	1488cc	550	80bhp	Fuhrmann four-cam engine. Roller bearing crank developed for racing in the mid engine 550 racing sports car
1953	589	Flat-four	1290cc	356		Hirth plain-bearing engine (previous VW-based Porsche units had roller bearing crankshafts)
1953	589	Flat-four	1286cc	356-1300S	60bhp	A Fuhrmann cam engine
1953	547	Flat-four	1488cc	550 LM	114bhp	Three cars at Le Mans 1953 ran with these Fuhrmann engines revving to 7500rpm
1953		Flat-four	1093cc	550LM	72/78bhp	A special unit developed to tackle the 1100cc class at the Le Mans 24 Hours
	547	Flat-four	1488cc	550/Spyder/ RS		The ultimate 550 engine the 1500RS, revved 6500 to 7000rpm; factory racing engines had 125 to 135bhp

1955	616/1	Flat-four	1582cc	356A		Built to comply with the new FIA 1600cc class
1956	616/2	Flat-four	1582cc	356A		1600S Model. The 616 design engine would have a long life through into the 1960s
1957	547/1	Flat-four	1582cc	356 Carrera	115bhp	This type was dry sumped, Solex carbs, peak revs 7000rpm. The Carrera could exceed 200km/h (124mph)
1957	547/5		1679cc			Engine specially developed for hillclimbs
1958	547	Flat-four	1582cc	356AT2		Same as the 616 design but with cast iron cylinders. Carburettors now by Zenith
1958	547	Flat-four	1582cc	356 Carrera GT	125bhp	A highly developed version for motor sports
1958	547/3	Flat-four	1488cc	718 RSK	142bhp	Works racing engines with Weber carbs peak revs 7500. Could go to 162bhp
1958	692	Flat-four	1587cc	718RSK	150bhp	Le Mans 1958 Works cars top speed 155mph
1958	692	Flat-four	1587cc	356 Carrera GT	105bhp	Engine with increased compression ratio; steel cranks with counter balance
1959	692/2	Flat-four	1587cc	356-1600GS		Sport engine for racing and fast road
1959	692/3	Flat-four	1587cc	356-1600GT	115bhp	Four cam. 100 of these engines were built for FIA homologation for 1600cc GT Class



A type 547 engine – a contemporary drawing. (P)



A beautiful piece of engineering: the Fuhrmann quad-cam Carrera engine. (P)

Chapter 3

Growing up – the 1960s

By the end of the 1950s, Porsche was recognised throughout the world as a manufacturer of impeccable pedigree. The Porsche engine was seen to be of superior performance, and was now being used by many individuals and teams to provide reliability and power to replace their previous installations, or as original equipment. Cooper, Elva and Lotus were three of the smaller racing car manufacturers that would install Porsche engines, though it was in the USA that marques using Porsche power would become really popular.

Before we go into the cars, let us begin the 1960s with a look at a member of the Porsche company who would carve a distinguished future as a driver, homologation specialist and Porsche customer race car support guru: Jürgen Barth. He told the author: “I started with Porsche in 1963 as an apprentice, because of my father. We had fled out of East Germany.” (Author’s note: for those of the current and future generations reading this, one has to remember that East Germany was under the control of the Soviet regime – the then USSR. It was forbidden for anyone to cross the inner German border to leave Soviet-controlled East Germany. Before the Berlin wall was built in 1961, East Germany had constructed along its border of 866 miles (1393km) a continuous line of high metal fences and walls, barbed wire, anti-vehicle ditches and minefields. The border was patrolled and watched from watchtowers by around 50,000 armed East German guards.)

Jürgen continues: “My father had been racing until 1956 in East Germany for EMW (Eisenacher Motoren Werke). But then the DDR (East German) government decided to stop racing as it was not compatible with the socialist ideology. Huschke von Hanstein contacted my father and asked if he could race for Porsche in 1957, which he did, but at first he did not want to leave East Germany because of the family; every time he went to the West, driving for

Porsche, my mother had to hand in our passports until my father came back home. Then, one day, at the German GP on 4 August 1957, he won the Formula 2 1500cc Class with a 550 Spyder. (That year the German Grand Prix F1 grid was bolstered by a field of F2 cars.)

"However, on the podium the organisers played the wrong National Anthem. [Author's note: they played the West German anthem; they should have played the East German one to avoid causing offence]. Every time my father went to the West a KGB (Stazi) man followed him, so when he heard the anthem he told his KGB bosses in the East. Luckily, my father, being a well-known racing driver, had a good friend in the government who learnt the same day what happened and warned my father not to go back to his home in East Germany, otherwise he would be arrested and probably put in prison. My mother was informed of what happened, and we had to get out of East Germany, because we feared the KGB would come for us. We left our home at Herold, near Thum, leaving everything as it was, as if we had just gone to the shops. In fact, we went out the back door and walked through a forest, where we met a friend with a car. So the journey continued in the cars of different friends. We changed three times into different cars that drove us to East Berlin; it was 30 November, a special date at that time when people were allowed to travel to go to see relatives, and because of this there were very few controls that day. Remember, my mother and I had no passports, no papers. Once in East Berlin, we went on the underground train from East Berlin to West Berlin. We were lucky: once more there was no border checking. Once in West Berlin my mother asked me if I would like to stay here in the West. I replied: 'Oh yes, please! No school on Monday – yea!' My father met us in West Berlin and we flew to Stuttgart where he had found a home for us near the Porsche factory. My father had started working as well as driving for Porsche, and he was an instructor at a race driving school at the Nürburgring. I used to go up with him to help at the driving school. I was 10 years old. He used to stand on the outside of a corner with his pupil, telling him to watch what I did – I was driving the car! He had taught me to show the way through the corner. On many occasions at the driving school

he used me, driving a 356 Carrera 2 to show the line, driving slowly, but the funny thing was, when he couldn't see me any more as I went round the next corner I accelerated. I got to know the Nürburgring quite well! When I was old enough I did an apprenticeship as a mechanic for 3½ years, and then I did a second apprenticeship with Porsche for business studies.

East German Edgar Barth, winning the 1957 German Grand Prix Formula 2 Class with a 1500cc Type 550 RSK Spyder. (JB)

"After these apprenticeships in Germany you're called an engineer (Ing). Then I went into the Porsche press department with Huschke von Hanstein, doing exactly the things my father had done before, because that was one of his jobs, looking after customers, organising press events and presentations of new cars, and then eventually I got heavily involved in the administrative organisation of motorsport, doing all the reservations of hotels, entry forms, and the homologation. This, of course, involved the rallies too. That's where we started rallying, winning three World Championships, and working with Waldegård, Larrousse and guys like this. It's also where I learned

how to drive properly for competition. I started driving in 1968 in some little rallies, together with John Buffum, who would become many times American rally champion. With these races I worked my way up into serious racing by 1971/72. Also at this time I was occupied doing all the homologations, from 1968 onwards."

We have taken this look at the background of Jürgen Barth because his input to the whole story of *Powered by Porsche*, whilst frequently unseen, is essential to our research due to his knowledge of all the Porsche race cars and customer experiences.

Edgar Barth on the top place of the podium at the Nürburgring, 1957. The West German organiser played the West German National Anthem – the KGB men (Stazi) from the East were not best pleased. Prison awaited Edgar Barth if he returned to the East. (JB)

Class of the 1960s: Jürgen Barth second from the left, 1963. (JB)

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Elva-Porsche

Elva, as already mentioned, was one of the early pioneers, along with Cooper and Lotus, to start to make a business out of motor racing just after the second world war. As for so many others in the 1950s, it was still an austere period. Many individuals, though, started to build specials in Europe, as we saw in the previous 1950s section. Some of the new characters of the 1960s would join those of the 1950s in becoming household names. In the UK, Colin Chapman, creator of the Lotus company; Charlie Cooper, followed by his son John, with the Cooper Car company; Lola was created by Eric Broadley; Alpine in France by Jean Rédélé; to which we can add Jack Brabham and Bruce McLaren, and several others. So it was with one Frank Nichols. Today, even within motor racing, his name

may be unknown or forgotten, but no enthusiast will forget the cars he created, the Elvas. Frank Nichols was born in 1920, and so inevitably was involved as a soldier during WW2. Like many, he paid a high price, being severely injured. It took some years to recover, during which time his skills as an engineer led him into cars, a garage, and a dip into motorsport. He was to meet a Mike Chapman (no relation to Colin), proprietor of Western Light Engineering; a decision to build a racing car was made, and on 27 March 1954 Frank Nichols took to the track, joining the famous 750 Motor Club, which was a breeding ground for young race car designers and builders (as it still is, in fact, today). Nichols started making engine tuning parts under the name 'Elva' whilst racing a car known as the CSM. It was quick, and Nichols soon started getting requests: where can I get one? Why Elva? It is said the name came from the French 'Elle va' (she goes). The CSM was to lead to Elva cars, the first one ready in December 1954. Light and fast, they were in great demand. A variety of different engines could be fitted, and it was probably inevitable that it was not long before Porsche was being considered. By the late 1950s, Elvas were racing throughout Europe and the USA. János Wimpffen's superb work ELVA tells the whole story. Our interest, of course, is in the Elvas that were powered by Porsche. It is thought the first one was in the USA in 1961, when SCCA racer John Coan fitted a pushrod flat-four Porsche engine into a front-engined Elva, calling the car a Pelva; it is recorded as racing in 1963, at Courtland, Alabama.

The lightweight Elva matched with the best development yet. The installation of a 771 flat-8 engine took Edgar Barth to victory on the mountain race at Rossfeld. But it was not a car he favoured and he went back to using his faithful 718. (P)

Returning from the winning climb at Rossfeld, 7 June 1964: Edgar Barth's Porsche-powered Elva-Porsche Mk VII. Note right-hand drive. (P)

In October 1962, Huschke von Hanstein was at the Puerto Rico Grand Prix, a sports car race, along with Porsche dealer Oliver Schmidt and the US racing guru Carl Haas. They saw the previously all-conquering Porsche 718 of Dan Gurney soundly beaten by Roger Penske's lightweight Cooper, powered by a Climax engine. In Europe, the little lightweight Abarth sports cars were also giving Porsche trouble. Hanstein had seen enough; he observed that motor racing was moving on; he wanted something lighter than the 718RSK, and thought an Elva chassis might be worth trying. Talks back in Germany saw Porsche legend Herbert Linge appointed to be the liaison between Elva in England and Zuffenhausen. An engine was shipped to England and fitted to a Mk VII Elva chassis.

Herbert Linge conducted testing at Brands Hatch. The car weighed in at 440kg (970lb) – 130kg lighter than the Porsche 718. Herbert

Linge says: “I heard about these cars but had never seen them; then I was sent to England to see the car. They ordered some engines, and I think Elva was planning to build about 10 or 15 cars with a Porsche engine, so my chief, Mr Rabe, said that we would sell them one engine and see how it went in the car, and if everything was all right, because we didn’t want anything bad to happen with this car afterwards, so I was sent over to England when they (Elva) finished the first car and I did some testing at Brands Hatch. Three days. It was going very well. But I found the frame was not stiff enough: as you drove the car you could see it was bending, so I suggested that they put stiffening tubes in to brace the car up to be less flexible. Then the car felt good. So we delivered some more engines for the next cars. I don’t know how many they finished. Not so long ago, I was in the USA and a guy talked to me at Daytona – I don’t remember the date – but he said he had the car I had driven in Brands Hatch. I asked how he knew, because I had no idea which cars went to America or anywhere else. He said there was some handwriting on the bodywork in there, on which I had written down something about the car which I had tested. He said he found this in this car. Yes; it was my handwriting. We often wrote something on the inside of the body of a car – some note about something specific to that car. So I think it was the original car.”

This is said to be at the Mont Ventoux hillclimb on 14 June 1964: Herbert Müller (camera), Egon Alber, and (right) Edgar Barth, with the Elva-Porsche Mk VII (51). Whatever the location, the picture is wonderfully in period. As for the car, it is recorded that the chassis design principle was to be the inspiration for the next generation of Porsche team thin tube-frame cars, the series 910, 908 and 917. (P)

In Europe, as motorsport fans will know, the European Mountain Championship was a very prestigious series of events, and it is here that this combination again proved victorious. Porsche, having had the report from Herbert Linge, and studied the report from Huschke von Hanstein during his USA trip, had decided it would be an idea to evaluate the Elva chassis themselves. They bought Elva chassis 70P/038, fitting it with a Type 771 flat-8 engine, whilst going the other way to Elva were 15 Type 547 Fuhrmann Carrera engines.

In spite of Herbert Linge having had the chassis stiffened, it seems

that Edgar Barth (father of Jürgen Barth) still found the car rather too lively, compared with his heavier W-RS. But of course it now had an eight-cylinder engine, not the four. He felt that its suspension was the problem, causing it to move around too much on the rough surfaces frequently found on hillclimbs at the time. Jürgen Barth says: “No, my father did not like this car. Herbert Müller, I think, took it over from my father. Both said it was a ‘bumpy car,’ bouncing all over the place, similar to a kangaroo, which is what they called it. My father used it just the once, winning at the Rossfeld hillclimb; the surface there was very smooth, so it did not move around too much.”

Rossfeld was on 7 June 1964; Edgar Barth took victory over the 3.728 mile (6km) course. The winner was decided on the aggregate of two climbs. On a hot, dry day Barth won by 4.66sec ahead of Herbert Müller in a Porsche 904 eight-cylinder. 103 cars were entered, and the fastest race time climb was by Edgar Barth in 3min 15.31sec, but he had gone even faster in practice with a time of 3min 10.47sec. Sepp Greger, also in an Elva-Porsche Mk VII, was third fastest.

Edgar Barth had returned to his familiar Porsche 718 RS Spyder for the Freiburg-Schauinsland hillclimb on 9 August. Barth took victory, whilst Sepp Greger in his Elva-Porsche used at Rossfeld finished in 12th place. Sepp Greger was a rising hillclimb star in 1964, and was also using an Elva that year which was a sister car to the Mk VII used by Edgar Barth.

Anton Fischhaber with his right-hand drive Elva Porsche at the Ollon-Villars hillclimb, 29 August 1965 (chassis 70P/038), 10th overall. (P)

After a very short period, the Elva-Porsche was pensioned off in Europe. However, having learnt from Elva, Porsche designed one of the lightest-ever cars to go after the hillclimb championships: it would be called the Type 906 Berg Spyder, powered by the 771 eight-cylinder engine. Gerhard Mitter would bring the European Hillclimb Championship home to Porsche. Interestingly, the suspension was from Lotus; the chassis was of course a tube-frame one built by Porsche, and so does not qualify for our study here.

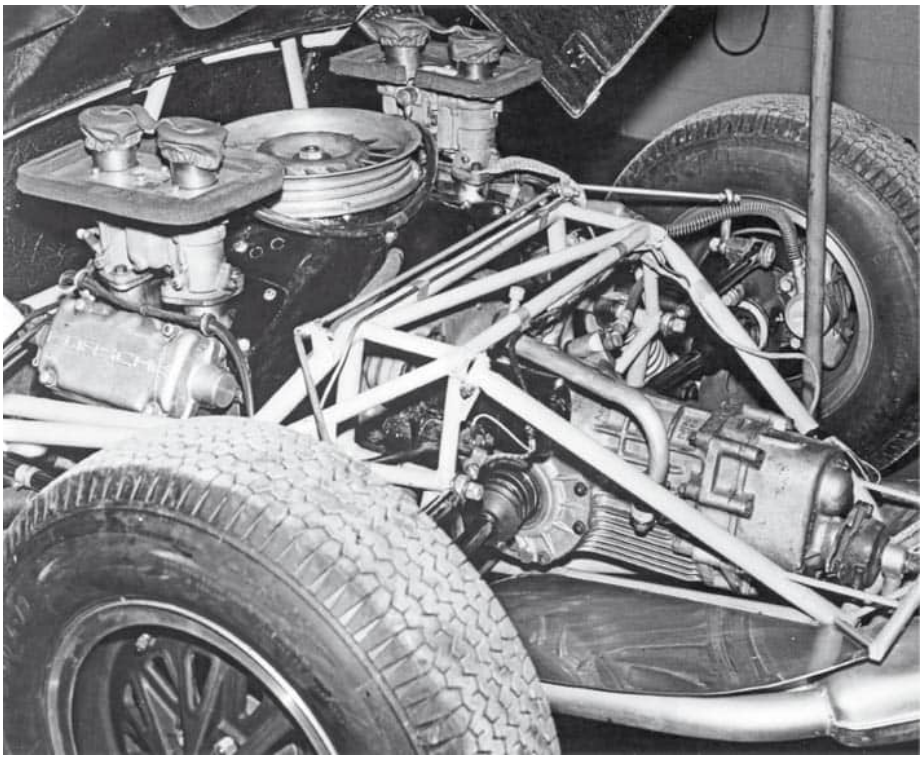
Although the Elva-Porsche period was coming to a close in Europe, things were just beginning in the USA. As we have seen, Huschke von Hanstein had watched Porsche's presence challenged by the Abarths, BMW and Lotus marques. His mind was made up at the Puerto Rico Grand Prix, when the Porsche 718 RSK of Dan Gurney had been beaten. The aforementioned Oliver Schmidt was not only a

dealer, but a Porsche importer/distributor in the USA. When the USRRC (United States Road Racing Championship) came up with a 2-litre professional racing class where money could be won, Mr Schmidt went looking for a car that could win. He knew about Elva and the cars in Europe. However, things did not move quite as fast as Schmidt would have liked, and it was August before a Mk VII Elva-Porsche was ready for testing in the USA.

The first car to go to the USA was entered for a small race in Wilmot Hills; Hap Sharp was recruited to drive it. He won, and also set a lap record. Haas, the team owner, was happy, and the car was prepared to go to an FIA open meeting at Elkhart Lake – the Road America 500 on 8 September 1963. Almost 100 cars were entered in the race, split into two engine capacities – up to 2-litre and over 2-litre – with all the top drivers of the period in the USA taking part. Bill Wuesthoff would drive the Porsche Carrera engine Elva-Porsche. From the start, the Elva shot into the lead, until Bob Holbert in a Cobra got by. That's how it stayed for two hours; as the pit stops came and went, the Elva was putting on a great show against the muscle cars. After some brief negotiations, Augie Pabst, who was co-driving Mecom Racing's Ferrari GTO, was called upon to take over the Elva-Porsche. It was found that, according to the rules then in place, Wuesthoff was likely to reach his limit of allowed distance driven before the end of the race. Someone must have forgotten to check and get a second driver on board! The leading Cobra that was battling with the Elva stopped first. Then Pabst arrived in the GTO, jumped out of the Ferrari and into the Elva-Porsche. Another pit stop for the big cars saw Pabst in the Elva-Porsche take the lead and hold it to the end. It had been an impressive first time out in the big league for the Elva-Porsche in the USA. It is said that Haas received 15 orders for the Elvas after that. However, apart from that one memorable victory, the story ahead would be a chequered one, though generally a successful one.

SCCA racer Ernie Erickson also fitted an Elva Mk VII with a Fuhrmann four-cam Carrera 1500cc RS Type 547. He also raced it at the Road America race on 8 September 1963.

Oliver Schmidt: the Chicago-based importer of Porsches became the liaison man for Carl Haas and Fred Opert (both race team owners) in the USA. Schmidt did the deals between Elva in the UK and Porsche Germany. (P)



Elva chassis: it featured thin-walled, small-diameter tubes, making it very light, yet by the time of the Mk VII its construction ensured it was very rigid. (P)

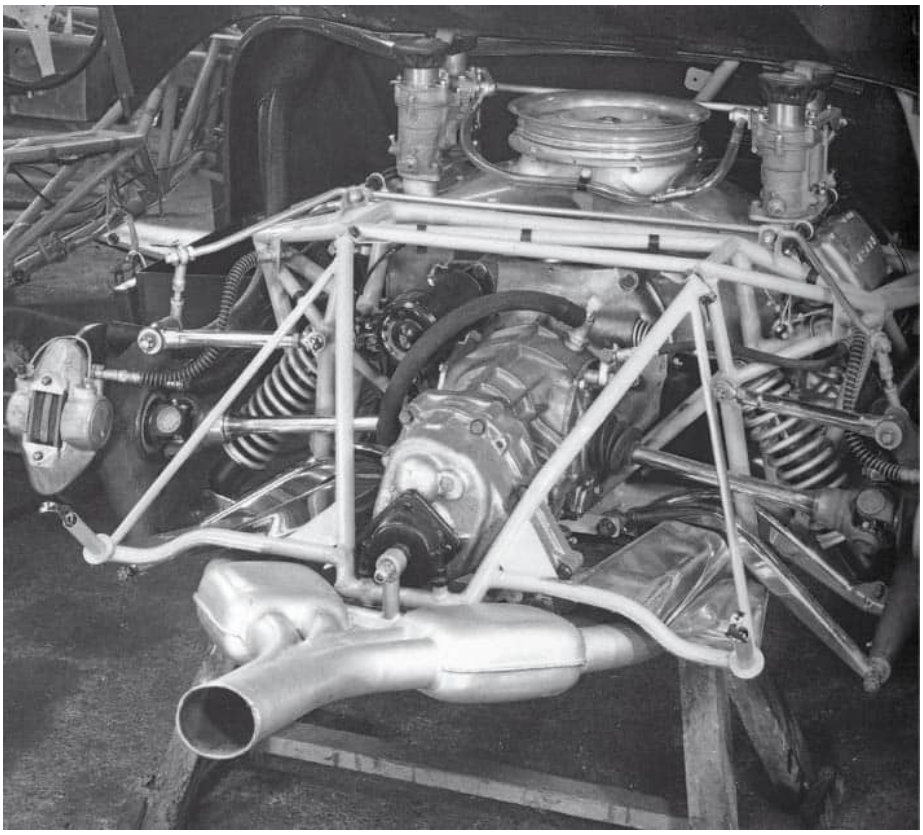
Racing continued into 1964, and a revised new tube-chassis unit, stronger and stiffer than the earlier 1963 version, arrived. Deliveries started to be made to the USA, and in true tradition the American teams made many modifications, after initial performances began to show up faults that drivers felt needed rectifying. In the end, 19 cars were said to have been built for the US market. Joe Buzzetta and Bill Wuesthoff were prime movers in sorting the cars.

The Fuhrmann four-cam engines, as already mentioned, were the backbone to the success of the Porsche engine in the period, and from start to finish some 1703 of them would be built. The Elvas predominantly used the type 547/5 and 5A. Many spare parts were made, and it is certain that some customers modified their own engines in the USA.

Wuesthoff secured sponsorship from Robert Bosch USA and ran most of the 1964 US race season with the Elva-Porsche. In spite of

the American drivers in general still preferring the big US engines in larger cars, 1964/65 would be a great period of racing for the little Elvas. Bill Wuesthoff won the up to 2-litre USRRC class championship in the 1964 season. Joe Buzzetta also became one of the star performers, racing 11 times in an Elva-Porsche during 1964/65, with multiple 2-litre class victories.

The Elva-Porsche car, 70P/044L, originally used by Sepp Greger and others went to Vasek Polak in the US. Jerry Titus first drove it on 30 May 1965, but unfortunately dnf'd.



Inspiration – the type 547 Porsche engine in the rear of the Elva chassis. Similar to the installation in the Mk VII of Ernie Erickson, with an overhead flat fan. (P)

George Wintersteen in his Elva-Porsche at the Augusta International Speedway, 29/2/1964 to 1/3/1964, USRRC races, chassis 70P/035: 10 ov, 3rd in class. Elva-Porsches, mainly Mk VIIs, would continue racing and taking class wins right through to 1969. (P)

The Elva-Porsche of Hap Sharp also at Augusta: 9th overall and 2nd in class. (P)

Here we see some of the impressive period performances of the Elva-Porsches in the USA:

25/8/1963	Wilmot Hills SCCA Regional, 70P/024	Hap Sharp	1st ov (first race in USA)
7/9/1963	Road America 500 Miles USRRC	Bill Wuesthoff/ Augie Pabst	1st ov
28-29/9/1963	Lynndale Farms SCCA, chassis 70/025	Ernie Erickson	3rd ov, 1st in class
29/9/1963	Milwaukee State Fair, 70/025	Ernie Erickson	1st in class
1/3/1964	Augusta USRRC, 70P/30	Hap Sharp	9th ov, 2nd in class
1/3/1964	Augusta USRRC, 70P/024	Charlie Hayes	7th ov, 1st in class
5/4/1964	Pensacola Corry Field USRRC,70P/35	George Wintersteen	4th ov, 1st in class 2-litre
11-12/4/1964	Marlboro SCCA National, 70P/31	Robert L Scott	4th ov, 1st in class
26/4/1964	Vineland SCCA Regional, 70P/035	George Wintersteen	2nd ov, 1st in class EM
3/5/1964	Laguna Seca USRRC round 4, 70P/045	Charlie Hayes	4 ov, 1st in class 2-litre
16/5/1964	Vineland Divisional, 70P/035	George Wintersteen	2nd in class 2-litre
17/5/9164	Winter Hills SCCA Regional, 70P/040	Lee Hall	2nd ov, 1st in class EM

31/5 to 1/6/1964	Bridgehampton SCCA, 70P/039	Joe Buzzetta	2nd ov, 1st in class EM
6/6/1964	Mosport Players 200 Canadian Champs, 70P/33	Bill Wuesthoff	3rd ov, 1st in class 2-litre
6/6/1964	Rossfeld Hillclimb World Sports Car Champs, 70P/038	Edgar Barth	1st ov
7/6/1964	Rosemount (Southport) SCCA Divisional, 70/024	Ernie Erickson	1st in class FM
14/6/1964	Mid Ohio SCCA National, 70P/040	Lee Hall	4th ov, 1st in EM 2-litre
21/6/1964	Road America SCCA National, 70P/040	Lee Hall	4th ov, 1st in class EM
26-28/6/1964	Watkins Glen USRRC Champs, 70P/045	Charlie Hayes	3rd ov, 1st in class 2-litre
5/7/1964	Rosemount SCCA Divisionals, 70/025	Ernie Erickson	1st in class FM
12/7/1964	Mid Ohio SCCA Divisionals, 70P/040	Lee Hall	1st in class EM
18-19/7/1964	Greenwood USRRC GT Champs, 70P/033	Bill Wuesthoff	2nd ov, 1st in class 2-litre

26/7/1964	Continental divided SCCA Divisionals, 70P/047	Bob Betts	1st ov
26/7/1964	Lynndale Farms SCCA Regionals, 70P/040	Lee Hall	1st in 1.6-litre class
26/7/1964	Lynndale Farms SCCA Regionals, 70/025	Ernie Erickson	1st ov
1-2/8/1964	Kent Pacific Raceway SCCA Divisional, 70P/048	Ralph Wood	1st in class EM
9/8/1964	Meadowdale USRRC GT Champs, 70P/039	Joe Buzzetta	6th ov, 1st in class
30/8/1964	Mid-Ohio USRRC Champs, 70P/033	Bill Wuesthoff	5th ov, 1st in class 2-litre
12-13/9/1964	Road America 500 Miles, 70P/040	Lee Hall/Mike Hall	5th ov, 2nd in class
12-13/9/1964	Road America 500 Miles, 70P/033	Bill Wuesthoff/ Joe Buzzetta	4th ov, 1st in class
12/9/1964	Vaca Valley Regional, 70P/048	Ralph Wood	1st in class EM
20/9/1964	Mid America Raceways,70P/047	Jim Johnston	1st in class EM

26/9/1964	Pepsi-Cola Trophy Mosport Canada, 70P/039	Joe Buzzetta	5th ov, 1st in class 2-litre
11/10/1964	Wilmot Hills SCCA Regionals Race 11, 70P/040	Lee Hall	3rd ov, 1st in class
10-12/11/1964	Riverside Race of Champions Race 5, 70P/048	Ralph Wood	2nd ov, 1st in class
6-7/3/1965	Palm Beach International, 70P/050	William Bowman	2nd ov, 1st in class
30/3/1965	Meadowdale SCCA Regionals Race 6, 70P/057	Ralph Trieschmann	1st
4/4/1965	Kirker Creek SCCA Regionals Race 3, 70P/048	Ralph Wood	1st ov
16/5/1965	Palm Beach SCCA Regionals, 70P/050	William Bowman	1st ov

30/5/1965	Meadowdale SCCA Regional, 70P/057	Ralph Trieschmann	1st ov
30/5/1965	Thompson SCCA Regionals Race 6, 70P/031	Joseph Giubardo	7th ov, 2nd in class
19/6/1965	Pomona SCCA Regional Race 5, 70P/044L	Jerry Titus	1st ov
20/6/1965	Elkhart Lake SCCA Road America National, 70P/057	Ralph Trieschmann	9th ov, 1st in class
24-25/7/1965	Willow Springs SCCA National, 70P/044L	Jerry Titus	1st ov

In the USA there would be still more successes, but it should also not be forgotten that Elva-Porsches were quite successful in South Africa, too; for example:

5/6/1965	Kyalami South Africa Sports Champs, 70/067	Dr Dawie Gous	2nd ov, 2nd in class A
20/6/1965	Roy Hesketh Sports Cars Race South Africa heat 1, 70/067	Dr Dawie Gous	2nd ov
25/7/1965	Lorenço Marques, South Africa, 70/067	Dr Dawie Gous	1st ov
15/8/1965	Roy Hesketh, South Africa, 70/067	Dr Dawie Gous	3rd ov, 2nd in class A
9-11/4/1966	Roy Hesketh, South Africa, 70/067	Luki Botha	3rd ov, 2nd in class
28/5/1966	Kyalami South African Champs, 70/067	Luki Botha	2nd ov, 2nd in class
9/7/1966	East London (South Africa) Winter Races, 70/067	Dr Dawie Gous	1st ov
24/7/1966	Lorenço Marques, South Africa, 70/067	Luki Botha	1st ov
6/8/1966	Kyalami Rand South Africa Sports Champs, 70/067	Luki Botha	2nd ov, 1st in class B
21/8/1966	Roy Hesketh, South Africa, 70/067	Luki Botha	2nd ov, 1st in class B
3/9/1966	Kyalami South Africa Sports Champs, 70/067	Luki Botha	2nd ov, 1st in class B
9/7/1967	Roy Hesketh SCC Race, South Africa, 70/067	Koos Swanepoel	3rd ov, 1st in class B
27/8/1967	Roy Hesketh, South Africa, 70P/067	Koos Swanepoel	1st in class
10/9/1967	Kirker Creek SCCA, 70P/050 Mk VIIS	Ed Bowman	1st ov and 1st in class
7/10/1967	Kyalami South Africa (Sports Round 8), 70/067	Koos Swanepoel	1st in class

With that demonstration of how Porsche power helped Elvas to

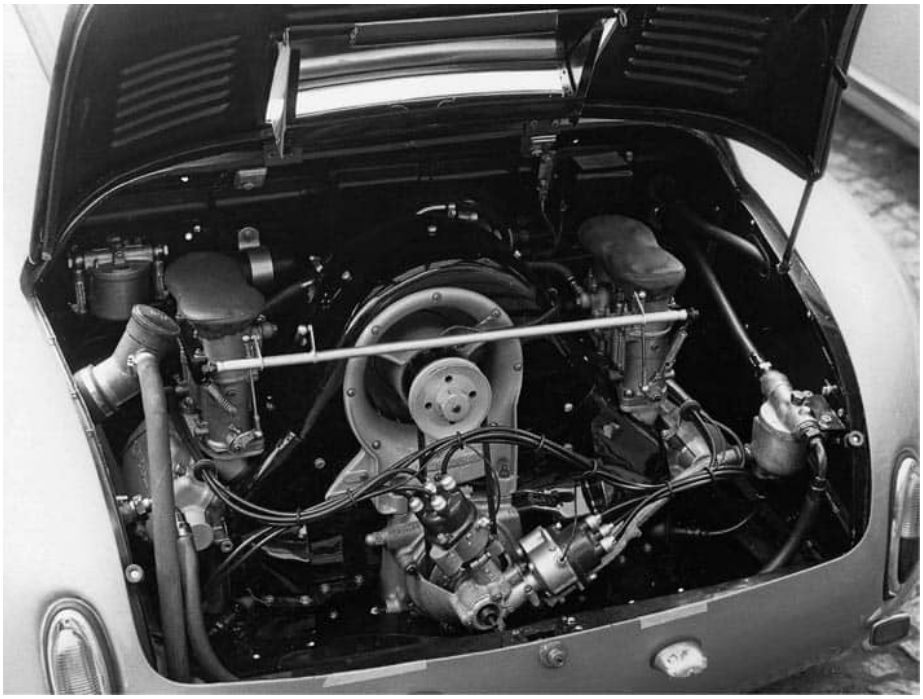
many victories, we move on.

♦ ♦ ♦ ♦ ♦

Abarth-Porsche

Strictly speaking, the chassis of the Abarth Carrera could be said to be a Porsche product, because those were the days of the floorpan chassis, before the all-in-one body chassis unit. However, the Abarth can certainly qualify for a mention here, due to the many changes Abarth was to make to the cars, unfortunately not all to the liking of Porsche. Carlo Abarth is of course not new to our story (see the opening introductory chapter, and the connections to the Dusio family and Cisitalia). As we have seen, Carlo, originally Karl, was an Austrian who raced motorcycles since 1928. He married the secretary of Anton Piëch, husband of Louise Porsche, Ferry Porsche's sister, who had brought Karl Abarth into contact with the Porsche Design Company. By the 1950s he was living in Italy, and married for a second time, his company well established in the Via Trecate in Turin. Carlo Abarth, with a high reputation for engineering expertise, well connected to Bertone, Zagato, etc, and working with stylists of the calibre of Franco Scaglione, received a call to attend a meeting on 18 September 1959 in a bar of one of Frankfurt's top hotels, the Frankfurterhof. At the meeting were Ferry Porsche, Walter Schmidt and Klaus von Rucker.

The distinctive lines of the 1960 Abarth Carrera Porsche GTL 1600cc. (P)



The1600 GS quad-cam Carrera engine, featuring dual ignition circuits, 1960. (P)

The Carrera GTL Abarth-Porsche in the Nürburgring paddock in 1962. (P)

By the end of the 1950s, Porsche's 356 had been given more power, but it had also got 'fat,' and the gain in weight needed to be addressed. Porsche was well aware of the Abarth lightweight coupés, and the tiny, superfast cars of the Austro-Italian. Abarth was asked if he would make a new lightweight car that Porsche would sell and call the GTL; a GT car, Porsche at first wanted 20 cars. Abarth was to build the cars with his own chassis, having copied the parts he thought useful from the existing 356 Carrera chassis, and then bodied it. Porsche supplied all the drawings and photos. Abarth employed the aforementioned Franco Scaglione to create a sleek, long-nose coupé and panel expert, Rocco Motto, to form the shape. However, there were major problems when the engine arrived to be fitted. The body was too small! Much modification took place before the car was debuted at the 1960 Targa Florio on 8 May 1960.

Herbert Linge, Dieter Lissman and Paul-Ernst Strähle took the new

Carrera GTL to a class victory. Two weeks later the class win was repeated, when Hans-Joachim Walter/Paul-Ernst Strähle came in 10th overall, at the head of the GT 2-litre class. At Le Mans in 1960, running in the GT 1600cc class, Linge/Walter took the class victory, and again finished 10th overall, averaging 150.81km/h (90.7mph). This car was regularly checked at 222km/h (138mph) on the Mulsanne straight, as it was then. But there was a problem: although the Abarth was light at 778kg, and the quad-cam 1587cc Porsche dry-sumped engine putting out 115bhp was quick, the build quality was okay for racing but not for production; it was not to the liking of the Stuttgart management, and the decision was made not to continue, after just 21 cars carrying Porsche chassis numbers 1001 to 1021 arrived in Germany.

The Targa Florio, May 1963: in 5th overall, Antonio Pucci/Paul Ernst Strähle in the No 76 1600GS Carrera GTL. (P)

19 May 1963 at the Nürburgring 1000km: Gerhard Koch and Paul-Ernst Strähle in the 1600 GS Carrera GTL Abarth-Porsche. (P)

♦ ♦ ♦ ♦ ♦

Sabel-Porsche

The Sabel cars nearly didn't make it into our story, but in fact research brought up the information that, like the Mong cars of the period, they did indeed race in the 1960s, and still are to be seen today. John Sabel hailed from the small town of Ross near the Golden Gate Bridge, San Francisco, USA. He came into contact during the 1950s with John Fox (mentioned in our Cooper-Pooper story in Chapter 2). Joe Huffaker, of Huffaker Engineering fame, was also involved when all three belonged to the Marin Coupé and Roadster Club. Two years' US Army service in Germany in 1955 had brought Sabel into contact with the cars of Porsche and Karmann Ghia; back in the US, he took to hill-climbing and autocross, with an eye to designing and building a race car on a VW floorpan. It was planned to use the many readily available parts from VW and

Porsche. The first car became the Mk I Sabel. John and his wife Pat Sabel went on to build 38 sports racers, Mks I, II and III, between 1963 and 1970.

John Sabel in one of the first Mk I Sabels, seen here at Marlborough Raceway in 1964. 38 original Sabels Mks 1, 2 and 3 were built. (Sab)

1966: the Mk II Sabel, a coupé of which John says he built just the one. It was built on a modified VW Beetle floorpan able to use VW, Porsche or Corvair power. (Sab)

John Sabel told the author: “The Porsche engines we used were all 356 (1600cc). My first Mk I, now owned by Dr Michael Ballo, has been run in recent times at the Hershey Hillclimb in 2015 and 2016. It was 3rd fastest in 2015, and 2nd fastest in 2016. When I ran the car in the early sixties, we started with a mildly tuned VW, then a Porsche engine. I was always working on new cars, working full time as well as going to university. My last car, the Mk III, raced and won its class a few times in SCCA races in the mid sixties. The coupé was a prototype that I sold to a guy in VR. But I lost contact with him. The car is a probable barn-find somewhere in north VR, waiting to be discovered! The Mk III is now owned by Dick Morel in Eastern Shore, MD. The car is running in vintage racing events. The Mk I weighed about 1250lb (567kg). The Mk III with the mid-engine space-frame was only about 1100lb (499kg). Its frame, complete with roll bar, was only 80lb (36.2kg). During those early years in the sixties, I was fortunate to drive a 356 Speedster. My friend Jim Netterstrom had a 911 that we raced at the Daytona 24 Hours in 1968 with John Kelly; we finished 13th overall and 3rd in Trans-Am 2-litre. We built six Mk

III models, all mid-engine space-frame."

Work had begun on the Sabel sports cars in the autumn of 1963 using a rented garage in Rockville, USA. The bodywork was created in glass fibre from moulds made by Sabel himself.

The first Mk I car would be entered in the 1964 Hershey Hillclimb, followed by an entry in the Duryea Climb. In 1966, Sabel found a buyer in one Ralph Williams, who subsequently took it circuit racing in SCCA events. The car proved successful and propelled Williams to the SCCA Northeast Championship, qualifying with sufficient points to race at the 1967 American Road Race of Champions at Daytona, where the Sabel placed 5th overall in the D sports racing class.

In 1968, Williams moved his car on to a Richard Williams (not related), who again found the car fast and successful enough to qualify for the 1969 SCCA run-offs, but the author understands the car did not arrive. The first Mk I Sabel is then known to have passed to several owners, without further racing, until it was parked up in the early 1970s. As mentioned, many more cars followed on over the years, with the Mk III being probably the most spectacular. Seen in different guises, the Mk III versions would eventually receive the 911 flat-six engine.

1964: Pat Sabel alongside the Mk I with a 356 engine at the Hershey Hillclimb. (Sab)

Looking like a Can-Am car: a Mk III Sabel, this one fitted with a Corvair engine, seen here at Summit Point Raceway in the early 1970s. (Sab)

The ultimate Sabel evolution in recent times: Porsche 911-powered, mid engine Sports prototype racer. (Sab)

One of the Mk Is, now restored and owned by Dr Michael Ballo, seen here at the 2016 Hershey Hillclimb. (Sab)

A Mk III Sabel-Porsche, seen here powered by a Porsche 2.2-litre six-cylinder driving through a Hewland Mk VIII gearbox. It still regularly runs in SCCA Regional events. (Sab)

Bobsy-Porsche

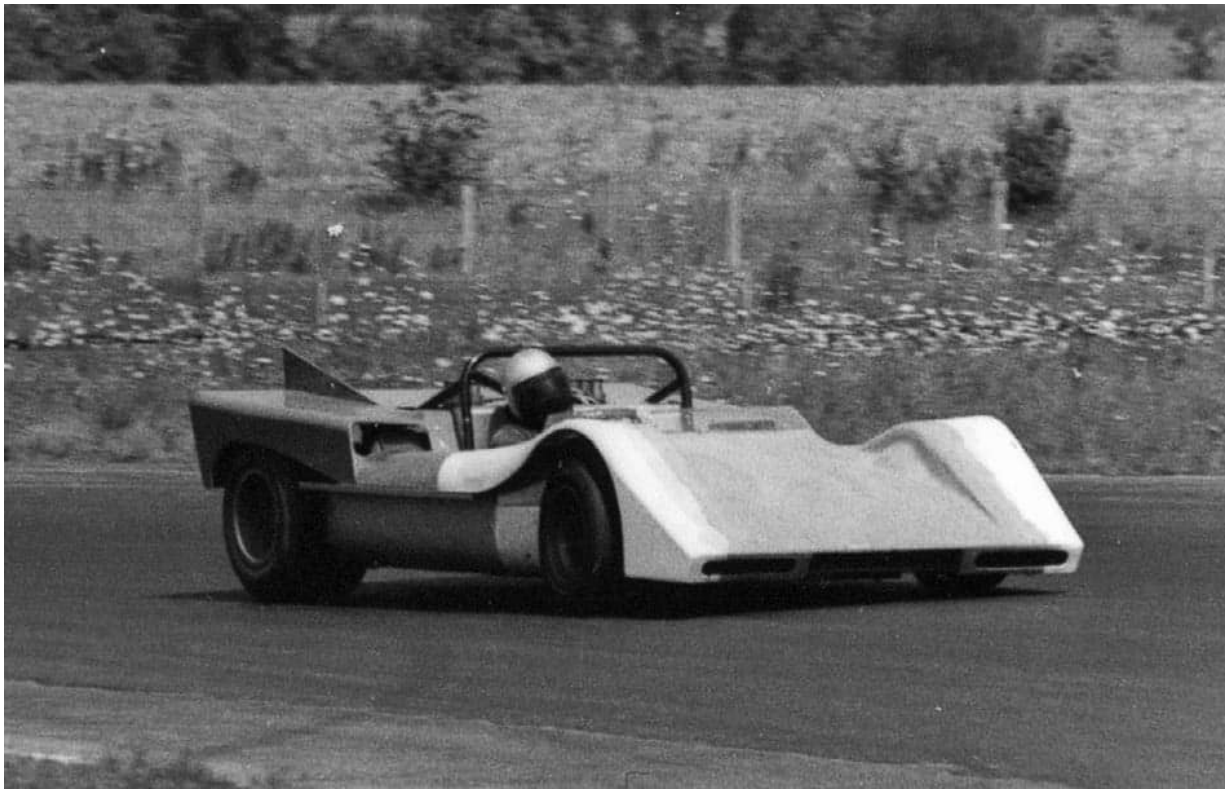
A car known as the Bobsy-Porsche was first seen at the 1962 Cumberland National sports car races, entered and driven by Jerry Mong. It is possible that some of the cars were powered by engines other than Porsche; however, Porsche power did feature in Jerry Mong's plans. The construction of this car came about because of an enquiry and subsequent commission by Allyn Heir and his brother Kaye, thought to be in 1961.

Jerry Mong, the constructor, called the two cars that were ordered SR1s. These early aluminium tube-frame cars had glass-fibre bodies, and were first powered by DKW engines and then Saab. As we saw in the previous chapter, in the 1950s, when the cars of Jerry Mong were called Mongs up to 1961, the work was pretty much a part-time affair. But in 1962 Jerry Mong decided to go full time, and to build cars for a profession. The Bobsy, it is said, is named after his favourite uncle!

The new cars would be called SR2s, and raced throughout 1962

and 1963 with four-cylinder Porsche engines, mostly in SCCA Regional and National races. Chuck Dietrich scored some notable results in the period. John Ingleheart would take over the mantle of success through 1964 along with Kaye Heir. A Bobsy Mk II came along in 1964, followed by a Bobsy Mk III.

Present owner of a Bobsy SR3, Don Anderson, told the author: “Having been a Bobsy owner since 1987, I have followed the history of most of the Bobsy sports racers over the years. As far as I know, there were two original Bobsy-Porsches built initially with the four-cam engines. Jerry Mong did not keep good records of his production, and many cars were never stamped with a serial number, so tracing the history can be difficult unless the original logbooks are available.”



This is the Bobsy SR4 undergoing testing at the Nelsen Ledges track in 1972. It is not known if this car ever went into production. Bobsy-Porsche SR4 was sold as an incomplete chassis to Steven Payne Herbert, and fitted with a 911 engine. That car is currently owned by Davis Irwin, who is restoring it. (DA)

The 1964 Bobsy SR3 Porsche (65), seen at a Rennsport meeting in the USA in the current era. (MS)

The flat-six Porsche-powered Bobsy today. (MS)

Dolphin-Porsche

Dolphin Engineering was established by Robert ‘Bud’ Hull and John Crosthwaite, the latter an English designer who had already worked on projects for Lotus and Cooper. The aim was to build cars for the newly created (1958) Formula Junior class with a 1100cc Fiat engine. At the end of the 1950s, the American car dealer Otto Zipper ordered a car for driver Ken Miles, which he hoped would compete with the Porsche RS Spyder. It was to have a 1600 or 1700cc Carrera engine with 160hp at 7800rpm. The four-cam engine was fitted with Weber carburettors of 46mm and Triumph disc brakes. During 1962, a car was developed under the name ‘America’ by future Carroll Shelby designer Don Maslin (he went to Carroll Shelby in 1964). The body was glass fibre, made by boatmaker Livesay near San Diego. It is thought that 12 cars were built. Initially called the Porphin, its results were limited in the era as can be seen in the accompanying table.

The Dolphin America as seen today at a recent Rennsport meeting at Laguna Seca. (MS)

A selection of some of the better results of the Dolphin America in the 1960s:

22-23/6/1963	Riverside SCCA California	Ken Miles	2nd ov, 1st in class EM
13-14/7/1963	Pomona SCCA Race 6	Ken Miles	2nd ov, 1st in class
13-14/6/1964	Willow Springs Divisional	Dave Jordan	1st in class 2-litre
10-12/11/1964	Riverside Race of Champions Race 5	Dave Jordan	3rd ov, 2nd in class

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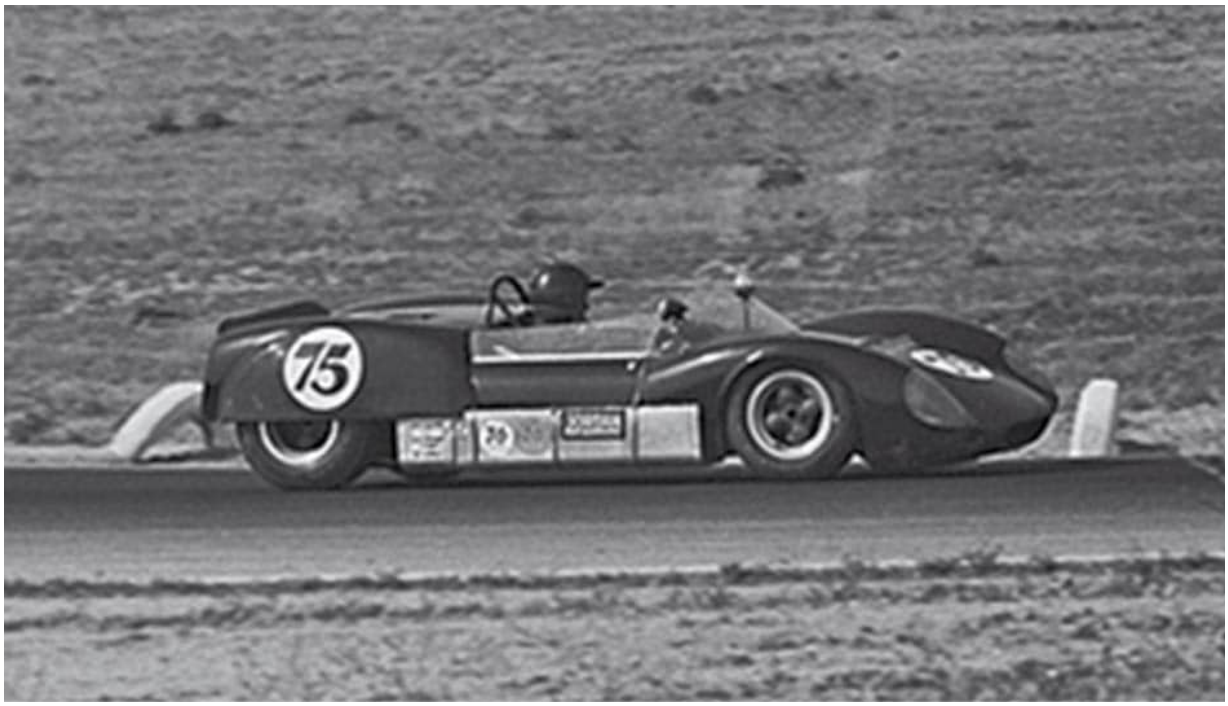
PAM Merlyn-Porsche

PAM Merlyn is said to have originated from a Mk IV Merlyn sports car chassis dating from the early part of 1960, based on the components from a somewhat damaged 550 Porsche Spyder. PAM Automotive, located at 708 North Sepulveda Boulevard in Manhattan Beach, California, was a company created by Scooter Patrick, Hans

Adam and Don Mitchell. Scooter Patrick was an accomplished driver who had begun his race career in 1954; Hans Adam created the chassis and Don Mitchell was the engine technician. The car looked very much like the Kelly-Porsche and Lotus-Porsche of the period due to its Lotus 19 bodywork.



The Merlyn Cyclone Platypus, created by the PAM team, with Miles Gupton in the driving seat. (U)

The 550 Porsche-powered car would be extensively entered, driven with some success by Miles Gupton.

2-3/2/1963	Riverside California SCCA Merlyn Porsche	Miles Gupton	7th ov, 1st in class FM
2-3/3/1963	Dodger Stadium SCCA Merlyn Porsche	Miles Gupton	4th ov
31/3/1963	Tucson Arizona SCCA Merlyn Porsche	Miles Gupton	4th ov, 1st in class
20-21/4/1963	Pomona SCCA Merlyn Porsche	Miles Gupton	4th ov, 1st in class
27-28/4/1963	Del Mar San Diego SCCA	Miles Gupton	1st in class
12/5/1963	Cotati San Francisco SCCA	Miles Gupton	4th ov, 1st in class
26/5/1963	Santa Barbara SCCA	Miles Gupton	5th ov, 1st in class
22-23/6/1963	Riverside SCCA California	Miles Gupton	4th ov, 1st in class FM

13-14/7/1963	Pomona SCCA	Miles Gupton	3rd ov, 2nd in class FM
25/8/1963	Newport SCCA	Miles Gupton	2nd ov
19-20/10/1963	Laguna Seca SCCA 200 Miles	Miles Gupton	18th ov, 8th in class U2-litre
4/4/1964	Del Mar SCCA Regional Race 6	Miles Gupton	1st ov
19/4/1964	Phoenix National Open	Miles Gupton	1st in class
30-31/5/1964	Santa Barbara Regional SCCA	Miles Gupton	2nd ov, 2nd in class FM
28/6/1964	Salt Lake City SCCA	Miles Gupton	4th ov

It is said that the original Merlyn tube-frame chassis was used to create a second PAM race car, namely the Platypus. The engine was removed from the Merlyn and fitted into the Platypus. It seems that Miles Gupton had a penchant for changing the names of his cars each time an update occurred, which may explain why the name Cyclone also appears in some lists. He also acquired a Lotus 19 body which was at one time fitted to the car and explains why the earlier photos differ from the look of the Platypus that we see today.

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PAM Platypus-Porsche

The Platypus, as described above, was a development of the original Merlyn, its chrome-moly space frame supporting glass-fibre

bodywork. In its Platypus format with its four-cam 550 A engine, it would race regularly through the mid-1960s.

Gupton continued to campaign the car in a wide variety of events from club level to several pro races, SCCA and the USRRC series. In 1964, the Platypus was the runner-up West Coast Champion, second only to Frank Monise's Lotus 23B. Old hands from the period told the author that it is thought that two more Platypus cars were created based on the first one. Having begun with the 550A four-cam Porsche engine, a Porsche 901 2-litre engine would eventually be installed. It is recorded that after that it even had an Oldsmobile V8 installed at one time. At least one of the Platypuses exists today and runs regularly at Historic races with a Porsche type 901 engine installed.

10-11/10/1964	Riverside International 3 Hrs 200 miles, chassis 001	Miles Gupton	13th ov, 3rd in class
17/4/1965	Lime Rock Regional	Walter Mann	1st in class EM
2/5/1965	Riverside International USRRC, chassis 001	Miles Gupton	7th ov, 4th in class 2-litre
22-23/5/1965	Bridgehampton USRRC	Walter Mann	12th ov, 3rd in class 2-litre
24-25/7/1965	Willow Springs SCCA Nationals	Miles Gupton	2nd in class CM-GM
25-26/9/1965	Riverside SCCA Nationals	Miles Gupton	5th in class
30-31/10/1965	Riverside 200 GP	Miles Gupton	19th ov
8/5/1966	Laguna Seca USRRC	Miles Gupton	8th ov
30/4/1967	Riverside USRRC	Miles Gupton	13th ov

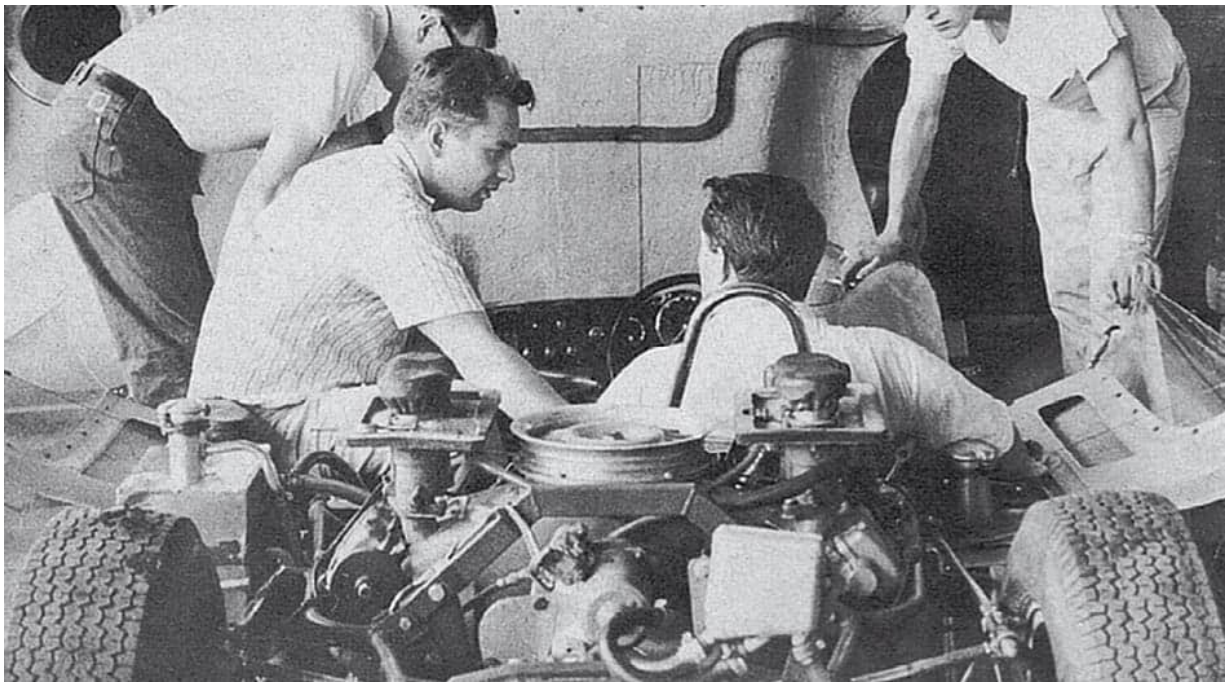
The revised Platypus as seen today, and used frequently in Vintage racing in the USA. (MS)

Kelly Special-Porsche

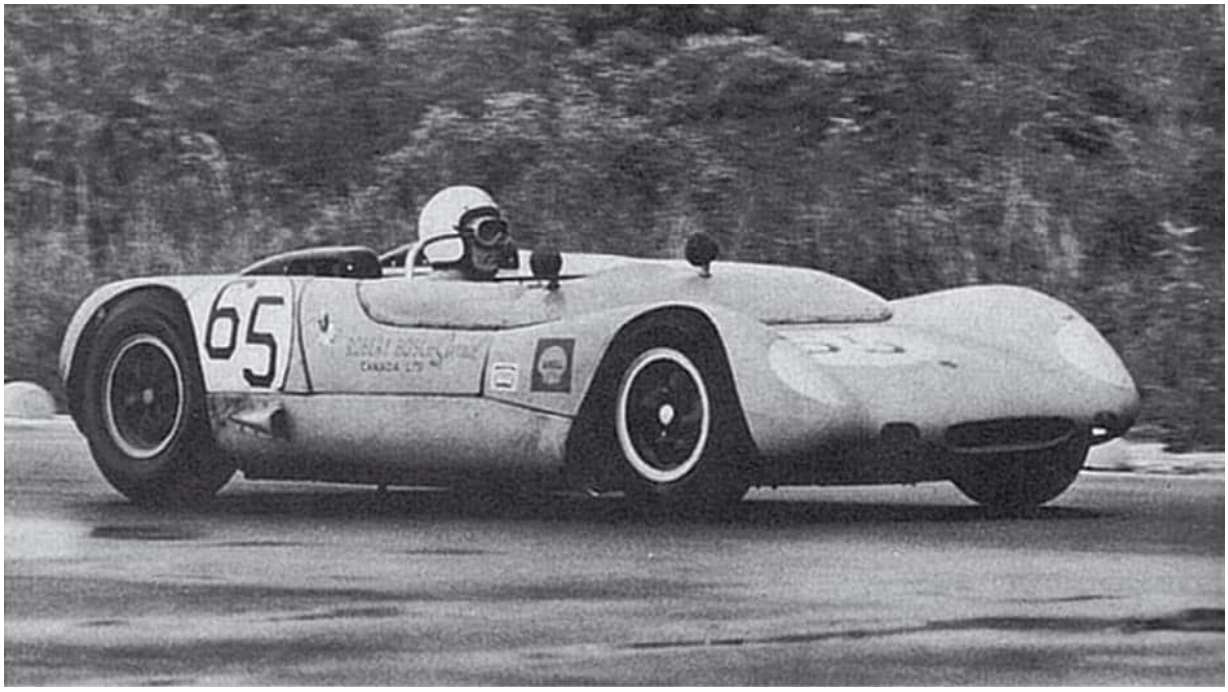
Wayne Kelly started driving competitively in 1958, having acquired a 356 Carrera whilst in Germany on his National Service in the Royal Canadian Air Force. Returning to Canada, he was to finish 2nd in the 1961 Canadian Grand Prix.

He raced regularly in the USA and in the Bahamas at the Speed Weeks. The Kelly-Porsche was often thought by the public to be a Lotus, but in fact it was an all-Kelly special production. It did, though, use Lotus suspension and axles. The chassis was constructed in Canada, as was the bodywork; Kelly said in 1965 that he was racing this car before the Elvas and Lotus came on the market. Canada Track and Traffic of June 1965 has the story of the car and Kelly.

A rare colour shot of Wayne Kelly in action – thought to be at a Bahamas Speed Week. (PW)



The quad-cam Porsche Carrera engine, with a top mounted fan, clearly seen, installed in the Kelly chassis. This is at Nassau 1964; Wayne Kelly second from left. Far right, partially hidden, is Paul Woolmer, who we have to thank for this information. (PW)



Grant Clark at the wheel of the Kelly Special in 1964 in Nassau. (PW)

Horst Kroll also thrilled fans in Canada and the US. He won the Canadian Driving Championship in 1968 in a Kelly-Porsche. (PW)

Wayne Kelly went on to build a second car and also built two dozen Formula Vee cars. He was known for the quality of his construction,

and continued racing his own creations, winning the Canadian Formula Vee Championship in 1965 and 1968. Others winning with his cars include Brian Robertson and Horst Kroll. Kelly tragically lost his life while competing during a race at Mosport in 1971.

1/6/1963	Mosport players 200 CRDA Sports cars	Wayne Kelly	dnf
23/6/1963	St Eugene, Montreal	Wayne Kelly	2nd ov, class SR/ Production
28-30/6/1963	Watkins Glen USRRC Round 4	Wayne Kelly	10th ov, 7th in class U2-litre
7/7/1963	Harewood Acres ASC Races	Wayne Kelly	3rd ov
24-25/8/1963	Watkins Glen SCCAC	Wayne Kelly	5th ov, 1st in class EM
28/9/1963	Mosport Pepsi-Cola CSCC	Wayne Kelly	13th ov, 6th in class 2-litre
26-28/6/1964	Watkins Glen USRRC Champs	Ray Parsons	14th ov, 9th in class
11/7/1964	Harewood Acres LASC	Wayne Kelly	dnf in final, but 2nd ov in qual
13-14/9/1964	Mont Tremblant, Quebec	Wayne Kelly	1st in class
5/6/1965	Mosport Players 200	Wayne Kelly	10th ov, 3rd in class 1

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Lotus-Porsche

Whilst Porsche had used Lotus components on its famous Bergspyder in 1963, it was not particularly interested in anything else Lotus. At the time, Bob Holbert was making a name for himself in the Porsche Spyders in the USA. Skip Barber was experimenting with a Lotus 23 powered by a Porsche engine. It seems his Lotus was the first powered by Porsche, with the following results:

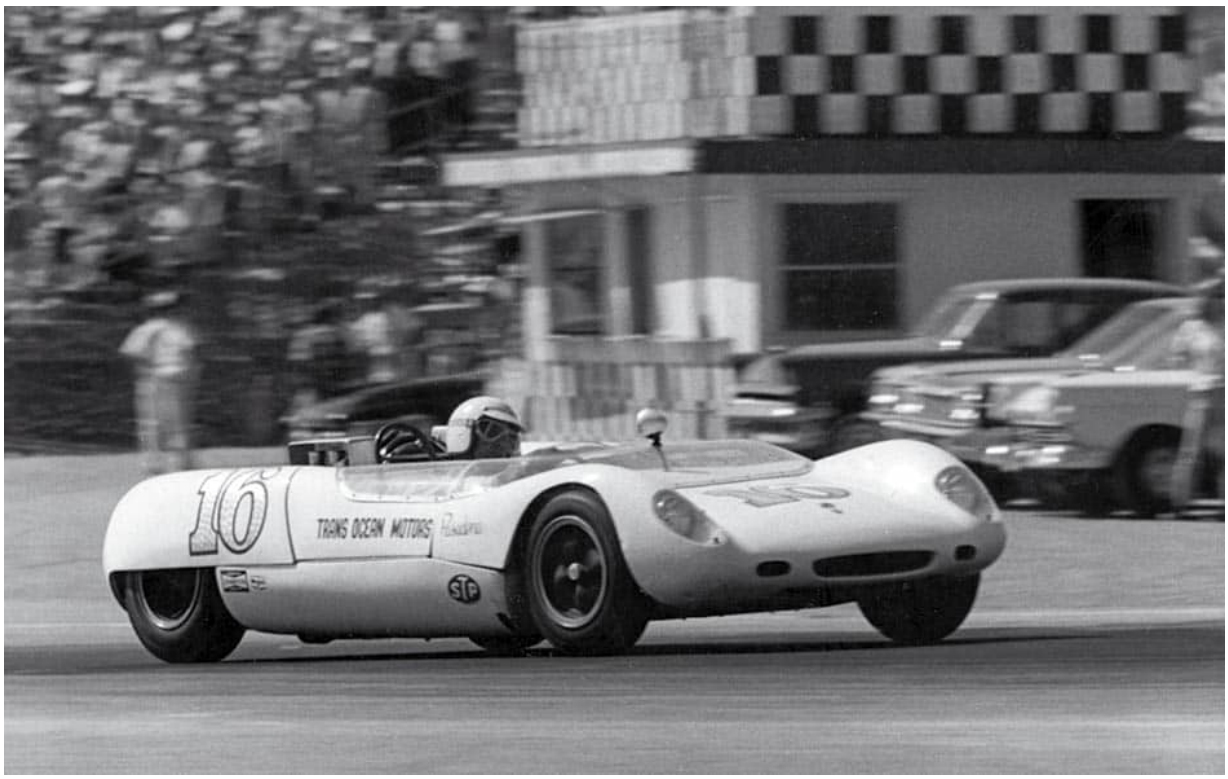
22/9/1963	Mid Ohio USRRC Lotus 23 U2-litre (first Lotus-Porsche race)	Skip Barber	dnf, lap 29 axle problem
28/9/1963	Mosport Pepsi-Cola CSCC chassis	Skip Barber	Result not listed
6-7/9/1964	Thompson SCCA National Race 5 Lotus 23	Skip Barber	1st in class

The car was seen again at the 1965 Bridgehampton Double 500km but dnf'd there.

Another rising star on the North American continent was one George Follmer. He had started to get involved with Porsche Club events, and had met Tom Nuckles, a Pasadena Porsche dealer running Trans Ocean Motors. Follmer is recorded as saying: "Tom was my benefactor and patron. Without him, I wouldn't have gone anywhere. The US Road Racing Championship series caught my eye, so Tom and I decided to see what we could do with a Lotus 23. A car was bought from Lotus for $4000 and we had to assemble it ourselves. We spent many nights fabricating it in Bruce Bureness' parents' two-car garage – Bruce still lived at home – we even had to cut sheet metal and bend it." As it turned out, he found the chassis pretty good, but his initial choice of engine – a sleeved-down Corvair unit – was not. It may have been cheaper than a Porsche, but the competition, people like Chuck Parsons, Ed Leslie and Bobby Unser, were using Cosworth-Ford engines which were quicker and more reliable. Follmer had first tried the Lotus with the Corvair engine on 26 April 1964 at Riverside, but it lasted only 19 laps, going out with overheating problems. Follmer bit the bullet and bought a new engine from Porsche which he fitted into the Lotus 23B chassis.

Fitting the Porsche wasn't as easy as it might sound: various chassis tubes in the engine bay area had to be cut out and replaced to allow fitment of the wider Type 587/3 four-cam engine. A new exhaust system and throttle linkage cable were required, and a new oil tank made. The oil cooler was fitted in the nose and its pipework ran through the chassis tubes. Finally, the rear engine cover had to be modified to take the carburettors and the fan arrangement of that

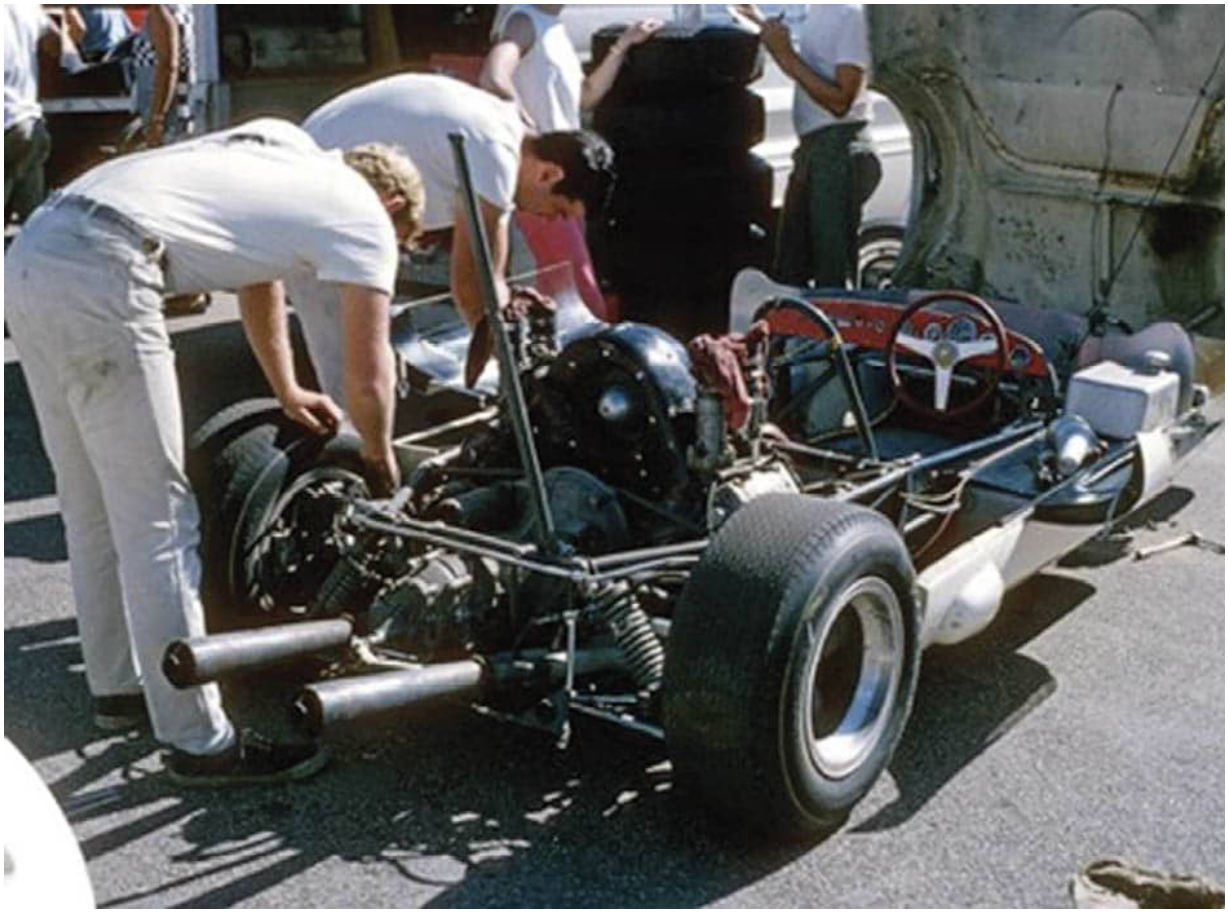
particular Porsche engine. An early setback was experienced when, one cold morning during a test session, a bearing in the engine failed, which meant a complete engine rebuild. For the rest of the season, the team concentrated on sorting out the various problems that crept up on them. This work paid off, and by the end of the 1964 season the Follmer Lotus-Porsche was hard to beat. It first appeared in a national race at the Riverside 200 Miles, with the Porsche four-cylinder engine 587 904, on 10/11 October 1964, when Follmer finished 11th overall. There was more to come, and at the SCCA regional event on 6 December 1964 at Willow Springs, Follmer took the Lotus-Porsche to its first victory.



The Follmer Lotus, racing in period. (VRC)

In recent times, the Trans Ocean Motors Lotus 23B of George Follmer, restored and running at a Rennsport meeting in the USA. (MS)

11th overall in its first outing at the Riverside 200 Miles, followed by a win at Willow Springs on 6 December 1964. 1965 would start with a victory at the USRRC race. (VRC)



The Porsche quad-cam Carrera engine with its original fan configuration clearly visible in this pits shot. (Cliff R)

For 1965 Follmer looked for a series that could be done without spending a fortune, and the USRRC was selected. Follmer, Bureness and Nuckles headed off in the Follmer family station wagon, towing the Lotus behind it on a homebuilt two-wheel trailer constructed by Follmer himself, for the first USRRC round in Pensacola, Florida. Soon times would be changing for the Trans Ocean Motors team, as it started to challenge the established teams, and the V8 Chevrolet-powered Chaparrals of Jim Hall/Hap Sharp that led the challenge bristling with innovations. Hall and Sharp's Chaparral 2a had just won the Sebring 12 Hours, beating the likes of Ford and Ferrari. A shock was in store: as the chequered flag came down at the end of the race, it was Follmer's Lotus-Porsche that crossed the line first.

The Lotus powered by the Porsche flat-four was a revelation

throughout 1965. A series of superb race performances followed, starting at the SCCA Pomona SCCA Regionals in March 1965, and ending with the Championship victory at Riverside.

6/3/1965	Pomona SCCA Regionals Race 5, 23-S-82	George Follmer	1st ov
11/4/1965	Pensacola USRRC GT Round 1, 23-S-82	George Follmer	1st ov

The points tally had started. So it went on all season, with only one dnf at the Mid-Ohio race. Points were awarded to each class equally, so it would be essential that Chaparral got extra victories, because, apart from Mid-Ohio, Follmer and the Lotus-Porsche took a string of podiums in the 2-litre class.

2/5/1965	Riverside International USRRC, 23-S-82	George Follmer	4th ov, 1st in class 2-litre
9/5/1965	Laguna Seca USRRC, 23-S-82	George Follmer	6th ov, 2nd in class 2-litre
22-23/5/1965	Bridgehampton USRRC, 23-S-82	George Follmer	6th ov, 1st in class 2-litre
26-27/6/1965	Watkins Glen USRRC, 23-S-82	George Follmer	4th ov, 1st in class 2-litre

31/7-1/8/1965	Kent (Pacific Raceway) USRRC, 23-S-82	George Follmer	8th ov, 2nd in class 2-litre
15/8/1965	Continental Divide USRRC, 23-S-82	George Follmer	3rd ov, 1st in class 2-litre
4-5/9/1965	Elkhart Lake USRRC 500 Miles, 23-S-82	George Follmer/ Alan Jones	3rd ov, 1st in class 2-litre
30-31/10/1965	Riverside 200 Lotus, 23-S-82	George Follmer	13th ov

The car never needed its spare engine: the one it started the season with was the one it finished with. Remember, this was Follmer's first full year, but as any fan of racing will know, George Follmer was to become a household name in racing circles as he carved out an impeccable career. This victory was transmitted to Huschke von Hanstein's desk in Porsche Germany, at the time head of the Motor Sports Department; he would employ Follmer to race at Sebring with another rising star, of whom we will hear more – Peter Gregg – to race to 7th overall at the Sebring 12 Hours in a works 904 GTS.

We also see a Lotus 23 Porsche in South Africa in October 1965. At the Kyalami Rand Spring Races, the Lotus 23 Porsche of Dr Dawie Gous took 1st overall. Others took up the Lotus-Porsche theme, though the results were not as good through 1966/67 as those achieved by George Follmer in 1965.

George Follmer and the Lotus-Porsche. The spare engine was never needed: the one that the car started the season with was the one it finished with. (VRC)

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During the 1960s, a new engine was to appear: the flat-six Type 901. Just as earlier we introduced Jürgen Barth, now is the right point to introduce a man who was to have a huge influence on Porsche: Hans Mezger would become the legendary father of the new engine, though its initial planning was in place before he came along. Hans Mezger told the author in 2016: “When I joined Porsche at the end of 1956, after I had finished my studies, Karl Ruoff was the chief designer in the diesel engine department and he said he was looking for a new engineer. My reply was ‘okay, but I really want to be working in the sports car department.’ I don’t think he was that impressed, but he said I would be contacted later. It was about two weeks after that that I heard from Mr Egon Forstner; I was offered a

job in the small calculations department where Mr Forstner reported to Karl Rabe. This was the chance I wanted; it turned out to be a very special department, where all the calculations about the whole car engine plus chassis were made. And not just the calculations: we also had drawing boards to design parts. At the time when I joined, 1 October 1956, there was no completely new development in Porsche, either engine or a car, only the race cars, the Spyder and the 4-cam, 4-cyl Fuhrmann engine. My new boss gave me the job to increase the power of the four-cam engine, because in trying to get more power they had experienced many problems. They thought a new man with new ideas would be useful. I was 26 then. They found they had problems with the cam followers, also a lot of problems with valves, because they were trying to improve the power with bigger valves, but each time they tried to increase the lift the valve spring broke. Many, many problems. It was my first job. It took a long time, but we did succeed, with the famous 587 engine in 1961."

Hans Mezger, in his work *Porsche and Me*, explains the beginning of the six-cylinder engine. "Porsche started to think about an engine for F1 and at the same time they started to have ideas for a new production engine to replace the four-cylinder – a new engine, a six-cylinder. The initial ideas were being done by another group. I was put in the group working on the Formula 1 car. In this group we worked on the whole F1 car, everything, not just the engine, and I helped with the chassis design. In parallel, in the other group the six-cylinder was started in the production design dept. They started as the base with the type 745, with camshafts located in the centre of the engine. That engine was not so modern by then, and the design at that stage wasn't new. Also, very soon in the 1960s there were discussions with Ferry Porsche that the F1 engine was not what we really wanted or that Porsche should have for the future. Ferry was not an F1 fan at the time. He was a sports car man, so that's why he said if you make that eight-cylinder engine it must be usable also for the long-distance races. From the beginning it was intended to have a 2-litre version also; later on we made a 2.2-litre of the eight-cylinder. But, in the end it was the need to create the six-cylinder engine that was to become my task. I have been called the father of the flat-six,

but in reality, Mr Piëch had a huge input; his visionary views made us all think better, and he could open doors to get things done." Hans Mezger went on to tell the author: "I was given the job to redesign the already started core of the Type 821/901 engine. I did the layout with the seven-bearing crankshaft, and a redesign of the combustion chamber with bigger intake valves. I decided on a chain drive for the camshaft with a hydraulically operated chain tensioner. I think the main change, though, was to have a dry sump which the normal road engines didn't have then, only the racing ones – the Carrera engines etc, had dry sumps. I remember some people in Porsche said you can't make a racing engine for production; others said it will be too expensive. Well, we built it; of course, no one at the time knew it was going to still be in production way into the present day as a flat-six, albeit somewhat changed over the years from air-cooled to water cooled. Now in 2016 we have gone back to four cylinders!"

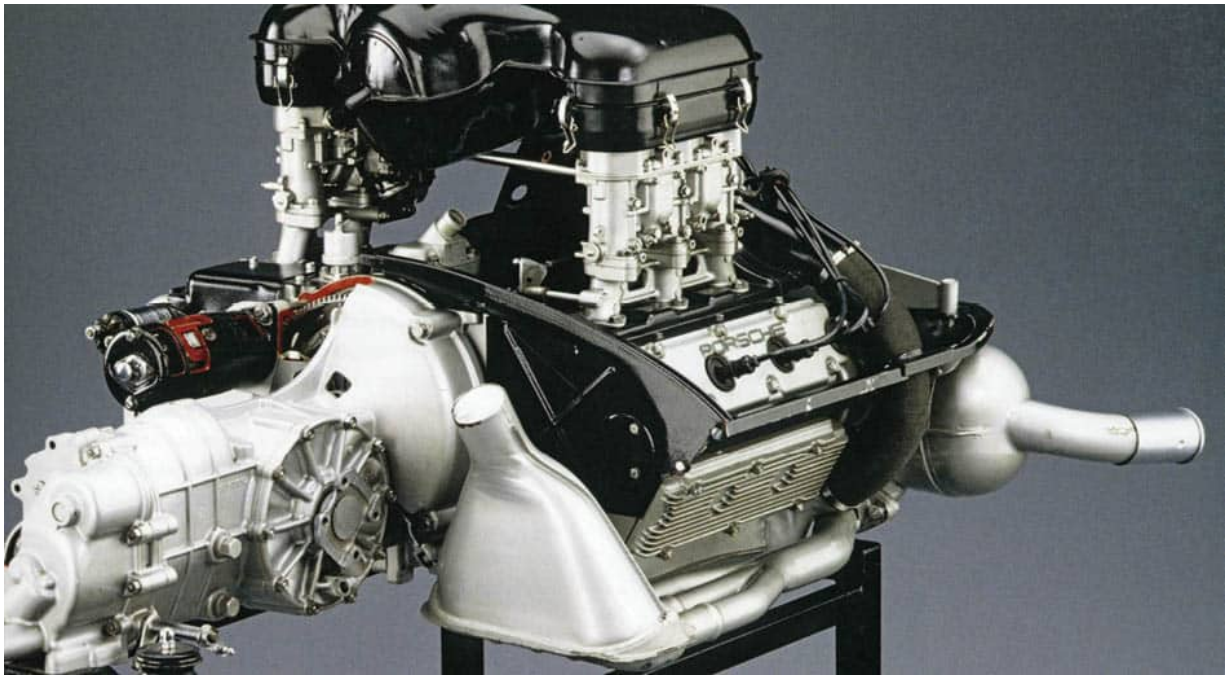
The 901 engine was initially planned for the Porsche 904, originally designed to take that engine, but, as it turned out, the 904 Porsche started life with the 587 Carrera engine, for which there were plenty of parts available for the private buyers of this new race car. Eventually, the new 901 engine came to life in the factory 904-6, in 1964. At the same time, the plan was for the 901 six-cylinder to go into a new road car that was to appear in 1963/4. As the world knows, the 901 turned into the 911, and a legend in every sense of the word had been born. Few privateers or other racing car manufacturers were interested in this engine at first, preferring to stay with the four-cylinder. However, by the late 1960s, Porsche had established itself as a truly major player on the world racing scene. The new car (the 911) and the new engine (the flat-six) were to dominate the rallying and racing worlds, and the racing world for years to come. A new series of cars followed the 904 – the 906 and 910s; they were a revelation – the 908 sensational and at the end of the 1960s came the awesome 917. These race cars are, of course, not a subject for this study, though the 911 engine and the developments that followed would be part of the history that put Porsche at the top of the tree for racing engines. The engine from the 911 model would also prove to be more than interesting when put into

the chassis of another car. So for the next chapter we move on to a new era, with six-cylinders now providing the Porsche power.

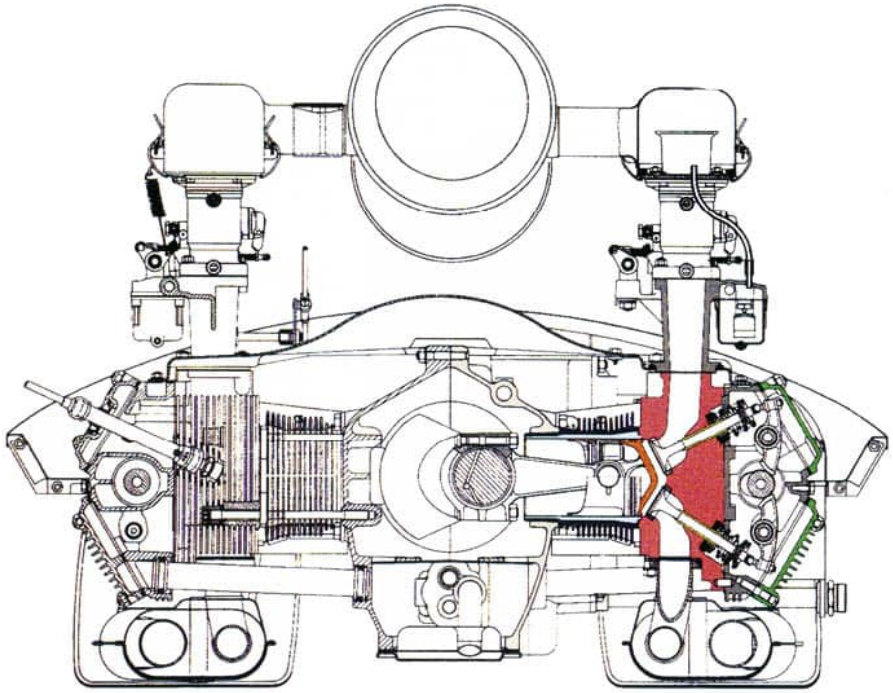
These are engines developed during the 1960s:

Year	Type	Cyls	cc	Cars	Power	Notes
1960	547	Flat-four	1679cc	718RS 60 Spyder	165bhp	Special Targa Florio factory car, top speed 150mph
1960/61	547/4	Flat-four	1587cc	718RS 60 Spyder	150/160bhp	Customer RS racing engines for hill-climbing and racing
1960	692/3a	Flat-four	1587cc	Carrera GTL	115/135bhp	Super-light very fast Carrera, revving to 7500rpm
1961		Flat-four	1966cc	Carrera 2	130bhp	Road and sport engine introduced in the 356B/2000GS series cars
1961	745	Flat-six	1991cc	Study of type 695	120bhp	A development design for the forthcoming new car, the 901/908
1961/3	587/2	Flat-four	1966cc	718 W RS	140/170bhp	Racing engines with Weber carbs, developed with various power bands
1962/3	771	Flat-eight	1982cc	718 Coupé	210/225bhp	First racing V8 Ran at the Targa Florio on 1962 and at Le Mans
1962/3	547/5	Flat-four	1587cc	Dolphin Porsche	150bhp	Car developed in the USA by Bud Hull, Dolphin Engineering
1964	616/16	Flat-four	1582cc	Carrera SC Coupé	107bhp	Developed for the 356 C series, last of the 356 four-cylinder engines
1963/4	771	Flat-eight	1982cc	Hillclimb	240bhp	Lightweight internals, allowed super power for a short time. Max torque 151lb-ft at 6700rpm
1964	771	Flat-eight	1982cc	Elva Mk VII Hillclimb	230/240bhp	Car used due to its light weight; it seems drivers were not convinced of its handling
1964/5	547/5	Flat-four	1679cc	Elva (Mk VII) Porsche	183bhp	Car built by Elva for Oliver Schmidt via Carl Haas for racing in USA, used during 1964 and 1965
1964	771	Flat-eight	1982cc	904/8	220/240bhp	Raced during 1964 both on circuits and hillclimb
1963/4	587/3	Flat-four	1966cc	Carrera 904 GTS	164.7bhp	Hans Mezger-modified 587 four-cylinder, revving to 7250 rpm, developed specially for the first 904 trans axle cars
1965/6	587/3	Flat-four	1966cc	Carrera 904 GTS	185/190bhp	Improved over the year before and in prep for the homologation into the FIA sports car category for 1965
1965	587/3	Flat-four	1966cc	Lotus (23B)-Porsche	170bhp	Engine type used by George Follmer in a Lotus 23, winning the US Road Racing Championship in 1965
1965/6	587/3	Flat-four	1966cc	Phillips Lotus-Porsche	170bhp	Engine type used by Pierre Phillips in a Lotus 23C in USA

1966	901	Flat-six	1991cc	911	130bhp	Standard 911 road engine
1966	901	Flat-six	1991cc	Carrera 904/6	210/220bhp	Hans Mezger-developed unit from the 911 130bhp production engine
1966	771	Flat-eight	2195cc	906/8	250bhp	Ran in the 1966 Targa Florio; a development of the earlier 904/8 unit
1967	771	Flat-eight	2196cc	907 Hillclimb	278bhp	Engine fitted to the 907; also used in the 910/8
1968	771	Flat-eight	2196cc	907 LM	270bhp	For Le Mans 1969, and Le Mans 1970
1968	771	Flat-eight	1982cc	909	275bhp	For the 1969 Hillclimb Championships
1968	901	Flat-six	2996cc	908	335bhp	Super-powerful unit developed from the 911 engine
1969	771	Flat-eight		908		
1969	912	Flat-twelve		917	540/580bhp	The engine for the legendary 917, first raced in mid-1969; max rpm 8700
1969	912	Flat-twelve		917		Raced at Le Mans 1970, lapping at an average speed of 148.5mph
1969	911	Flat-six	1991cc	Factory development		First turbo trial on a 911 engine, but not fitted to a car



Final first example of the engine that would become legendary. (P)



Developed from the Type 821 wet-sump engine; Mezger would create the 901/911 dry-sump flat-six engine. (P)

Chapter 4

New ideas – the 1970s

Whilst this work is concerned with alternative race cars to those made by the Porsche factory, it is not to be forgotten that many of the creative ideas from the factory would find their way into customer cars, or those of competitors. The engines are of course the beating heart, but by the middle of the 1970s we see aerodynamics starting to be appreciated far more than before, and in Porsche, Norbert Singer was to be the lead engineer in this area. He tried many things that would later be developed by others: some worked, some didn't. We will take a short look here at the black art of aerodynamics (as it was then), and this sets the scene for what came later in the 1970s and 1980s.

Ground effects: a big thing in the late 1970s, when Lotus started to understand this side of the downforce argument; until that time it had not really been exploited or even understood, though once more, that man Jim Hall and his Chaparrals had been ahead of the game, investigating ground effects years before. Gradually Lotus, Porsche, and others did become very knowledgeable, and such knowledge would become a major factor for success. (Remember, most companies did not have a wind tunnel in the 1960s when the 917 Porsches and Ford GTs came on the scene.) Norbert Singer, having joined Porsche in 1970, was to study this subject extensively, and in 1976 found himself studying aero for a new car, a speed record car, planned to publicise the new front-engined 924.

Norbert Singer: "The idea of Dr Fuhrmann and Helmuth Bott was to show that the 924 was a real sports car. Dr Fuhrmann wanted to run a series of speed record attempts in the USA, not in Europe at Nardò in Italy, like Mercedes. America was more important for sales. The project started in September 1976 with the planning. At that time we were still busy with the 1976 racing season, and the development of the 935 for 1977.

“The 924 had to look like a street car; because of low drag we would have liked to make a long-tail car, but this was not allowed by Dr Fuhrmann. Therefore we ‘invented’ the open flaps idea at the rear, which we found could work in a similar way to a long-tail car. The tests in April 1977 with a full-scale car showed we could reduce the Cd down to 0.26 with a balanced ‘downforce.’ The drivers were to be Jacky Ickx, Jürgen Barth, Günther Steckkönig and Eberhard Braun, with Al Holbert and Peter Gregg also being involved in the USA.

“However, the project was stopped at the end of the summer because Dr Fuhrmann had received news that Mercedes was planning to significantly beat its own record with a much stronger engine – a Wankel rotary type. The cancellation was to avoid giving Mercedes a chance of gaining more advertising and promotional advantages by beating our Porsche record instead of beating its own. So the project car was never run in anger, and is today in the museum back-up store.”

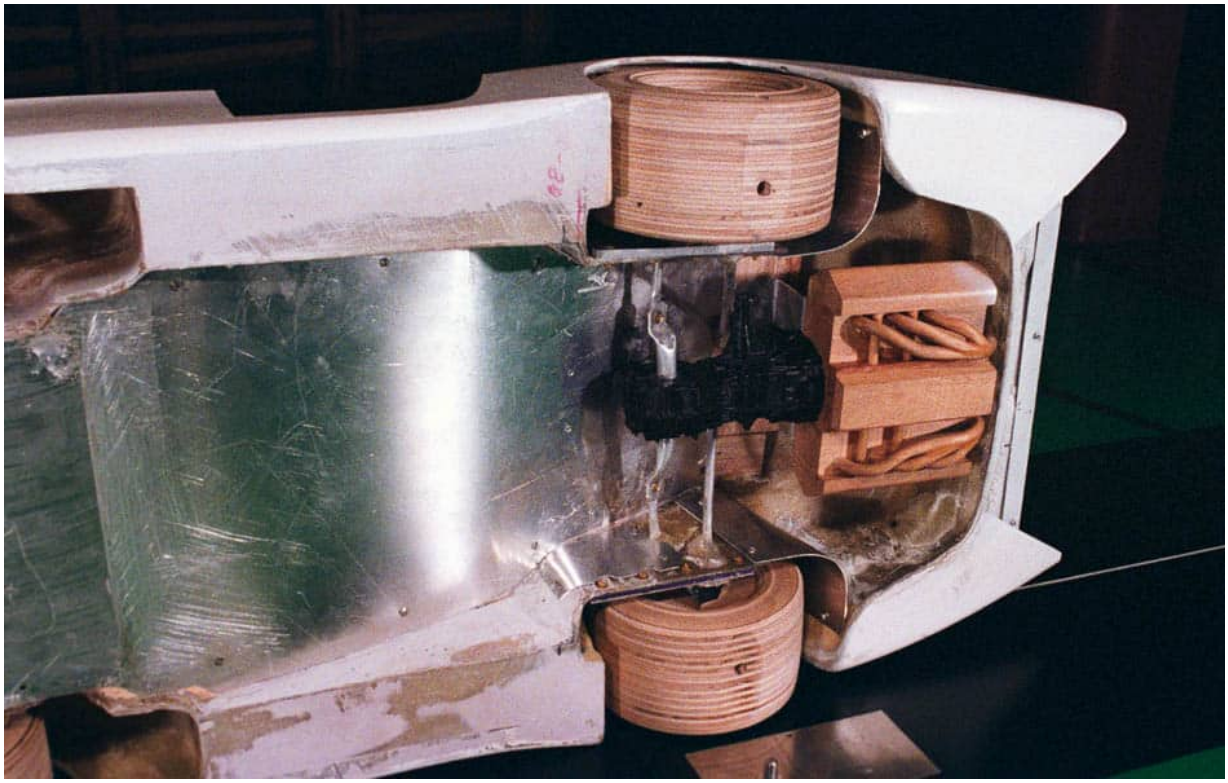
The wing design that gave the same effect as the long tail. Wind tunnel results from the test on 27 April had been promising. The drag coefficient came out at 0.267 to 0.270. (P)

The research team in 1976, led by Norbert Singer (left). (P)

Norbert Singer continues: “In the three years 1976, 1977 and 1978, we did quite a big development on the 935. When you look at the first appearance of the 935, and then look at the Moby Dick, the last one, it’s a big difference. I tried to create a 935 with ground effects. In 1978 Lotus was in F1 with ground effects, the skirts and so on, and I thought, well, probably I should have come up with the idea, but it was Chapman! But we have the 935, which is a development of the 911, and how do you make ground effects on a 911? The engine is in the way, but I had an idea, so I had a wind tunnel model made and we did get some ground effect work. The first idea was to bring air in from underneath via a hole in the floor and channel it where you normally have the rear seats; you duct the air up to and out of the bottom of the rear window, where it comes out passing the air via a wing, to the rear of the car, the design of which would need to be optimised to get the required effect of downforce.” The design Norbert Singer tried was with a shaped floor, steeply angled.

Norbert Singer: “By 1979 we found some ideas started to work,

and then the new regulations came along; we switched to designing the 956, and here we would really make progress. The management said we don't care about the 935 anymore and we won't spend any money. For me it was a fantastic exercise: we learnt a lot on these ground effects trials with the 935."



Singer's wind tunnel 935, planned to be the ultimate development of the 935. Here we see the early signs of the shaped floor. (P)

As is well known, by the 1970s, Porsche was established as the leading brand when it came to supplying fast, comfortable road sports cars – not cheap, but likewise not expensive when compared with the sports cars of Ferrari or Lamborghini, and eminently more practical than those marques. The 911 model could be driven to work during the week and raced at the weekend. A true usable sports car had arrived in the big league. Porsche would take its first outright victory at Le Mans in 1970 with the type 917. Soon we see the 911 morph into one of the great racing cars of the period: the type 935, its engine still based on the 911 but featuring huge development and

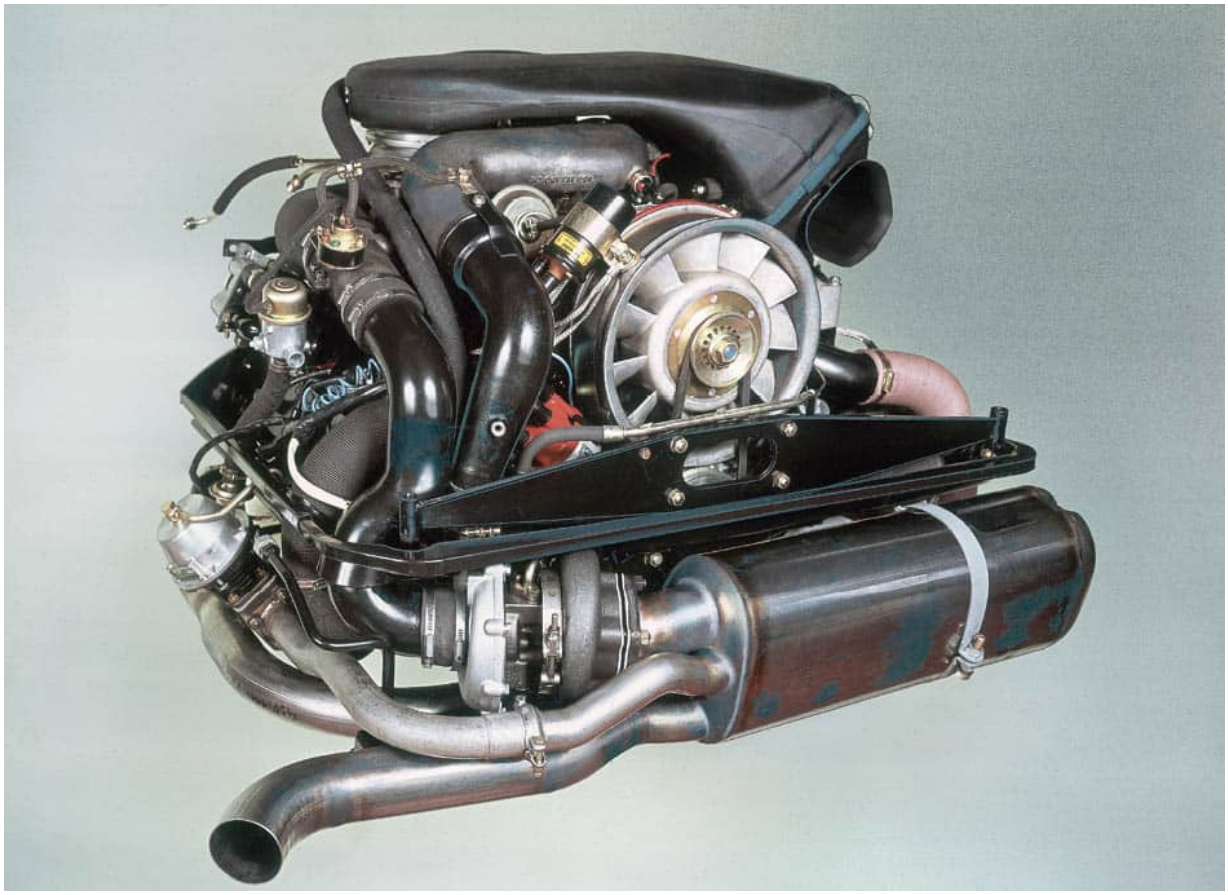
mighty turbochargers. Porsche engines were changing.

Let's take a look at the engines that would be developed during the 1970s:

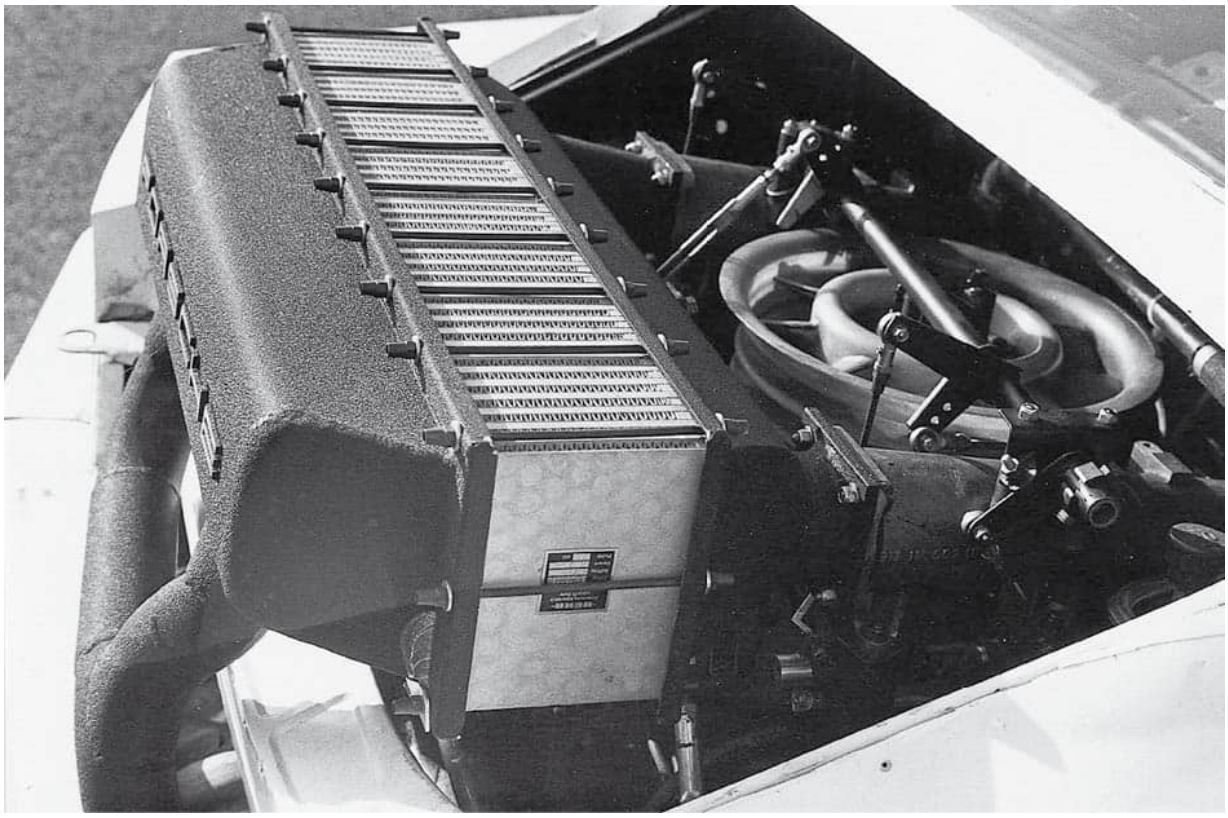
Year	Type	Cyls	cc	Cars	Power	Notes
1970	912	Flat-twelve	4494cc	917K	580bhp	In a car that achieves the first outright victory for Porsche at Le Mans 24 Hours.
1970	911	Flat-six	2195cc	911/T/S	125/180bhp	Engines developed for the 911 series of road cars.
1970	912	Flat-twelve	4907cc	917 LH	590/600bhp	Engine development for 1970 giving increased torque between 5500 and 5700rpm.
1971	912	Flat-twelve	4999cc	917K	630bhp	
1971	911	Flat-six	2381cc	911S	260bhp	Le Mans engines, special developments.
1972/3	911	Flat-six	2.5-litre			
1972	912	Flat-twelve	4494cc	917 Interserie	840-850bhp	Supercharged engines used in the Interseries challenge races.
1972	912	Flat-twelve	4999cc	917/10	950bhp	
1973	911	Flat-six	2687cc	Proto Turbo 2.7	250+bhp	Developed by Valentin Schaeffer for Dr Ernst Fuhrmann to drive. First turbo in a 911.
1973	911	Flat-six	2687cc	911 Carrera RS	210bhp	Used in the 911 that finished 2nd on the East African Safari Rally 1973.
1973	912	Flat-twelve	5374cc	917/30 Can Am	1100bhp	Championship-winning Can-Am 917 capable of 240mph.
1973	911	Flat-six	2687cc	911 Carrera RSR M491	300bhp	A racing motorsport version of the RS.
1973	911	Flat-six	2993cc	RSR Carrera Martini	315bhp	The full 3-litre examples of the Martini RSRs Group 5 FIA.
1974	911	Flat-six	2993cc	RSR Group 4	310-330bhp	Group 4 spec cars for racing. This model was also used in the IROC series in USA with 316bhp available.
1974	911	Flat-six	2.1-litre	Carrera RSR Turbo	450/500bhp	Raced at Monza April 1974.
1974	930	Flat-six		930 Turbo	240/280bhp	
1975	912	Flat-twelve	5374cc	917/30 Can Am	1500bhp	Final version Can-Am spec capable of propelling the car to 236mph.
1975/6	911	Flat-six	2993cc	RS Carrera Hillclimb	310-330bhp	Special lightweight Group 3 competition cars used for racing and hillclimbs.

1976	930	Flat-six	2142cc	934 Turbo	500bhp	Group 4 spec cars for racing. Would win the class in 1977, 1978 and 1979 at Le Mans.
	930		2142cc	935		
1976	930	Flat-six	2142cc	936 Turbo	520/540bhp	Variable boost for racing or qualifying allowed 540bhp to be available. Group 6 car.
1976	930	Flat-six	2120cc	936 Turbo	540bhp	Single turbo (12-valve engine).
	930/73	Flat-six	3-litre	934	590bhp	Called the 934 and a half! Created for racing in the USA in the IMSA series.
1977	930	Flat-six	1425cc	Turbo 935 (baby)	380bhp	Developed for the 2-litre Championships (FIA turbo factor of 1.4 applied).
1977	935	Flat-six	2994cc	935 77 Turbo	630bhp	Group 5 twin turbocharged (Porsche win the World Championship for Makes in 1977).
1977	930	Flat-six	2120cc	936 Turbo	545bhp	24-valve version of the 1976 936 model. Liquid cooled heads.
1978	935	Flat-six	3211cc	935/78 Turbo	845bhp	World Championship Sports Car series (winner at Silverstone 6 Hours).
1979	935	Flat-six	2994cc	935K3 Turbo	805bhp	Run by the Kremer Team – wins the Le Mans 24 Hours 1979.
1979	935/72	Flat-six	2650cc	Indy car	630bhp	Running in test in 1980 574bhp.

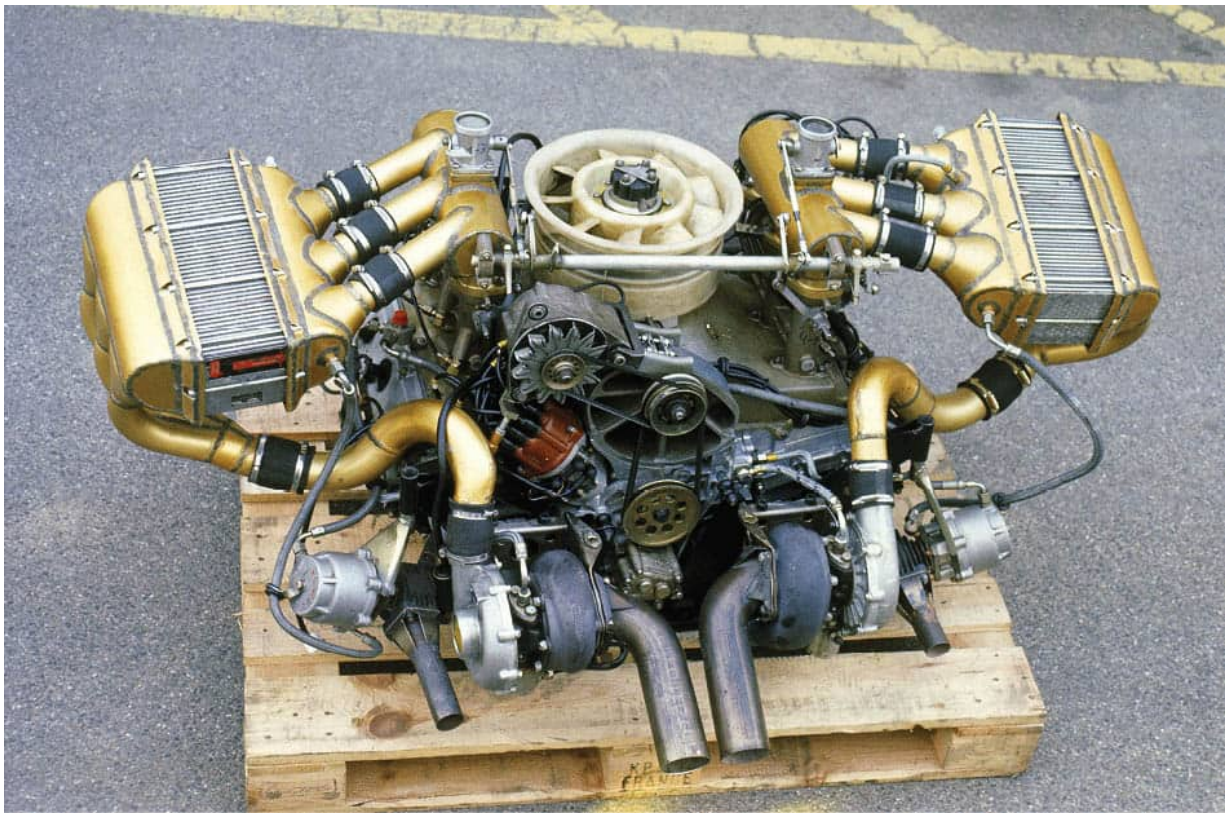
Also in the 1970s we see a huge expansion in companies and teams that would create new cars with a capability to use several types of engine from various manufacturers, not least those that would use a Porsche engine. The days of one man in his small garage during the ’50s and ’60s were drawing to a close. A few new names would come along, but mainly motorsport was becoming a world of big business, and we start the alternative marques of the 1970s here with one very successful company whose influence would spread over several decades.



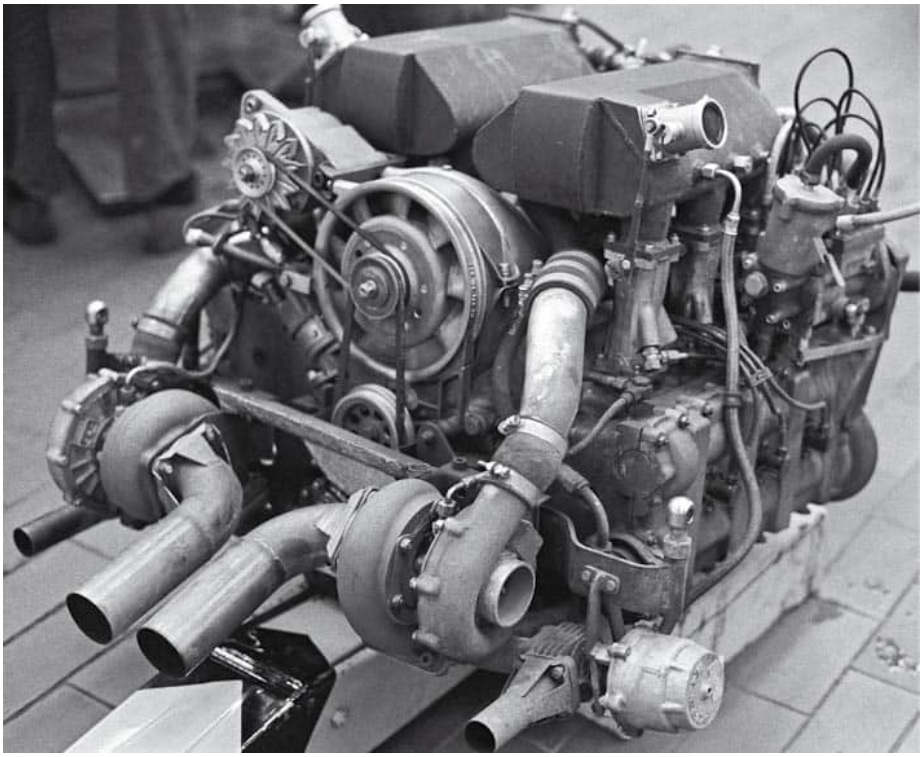
The 911 production turbo engine by 1975. (P)



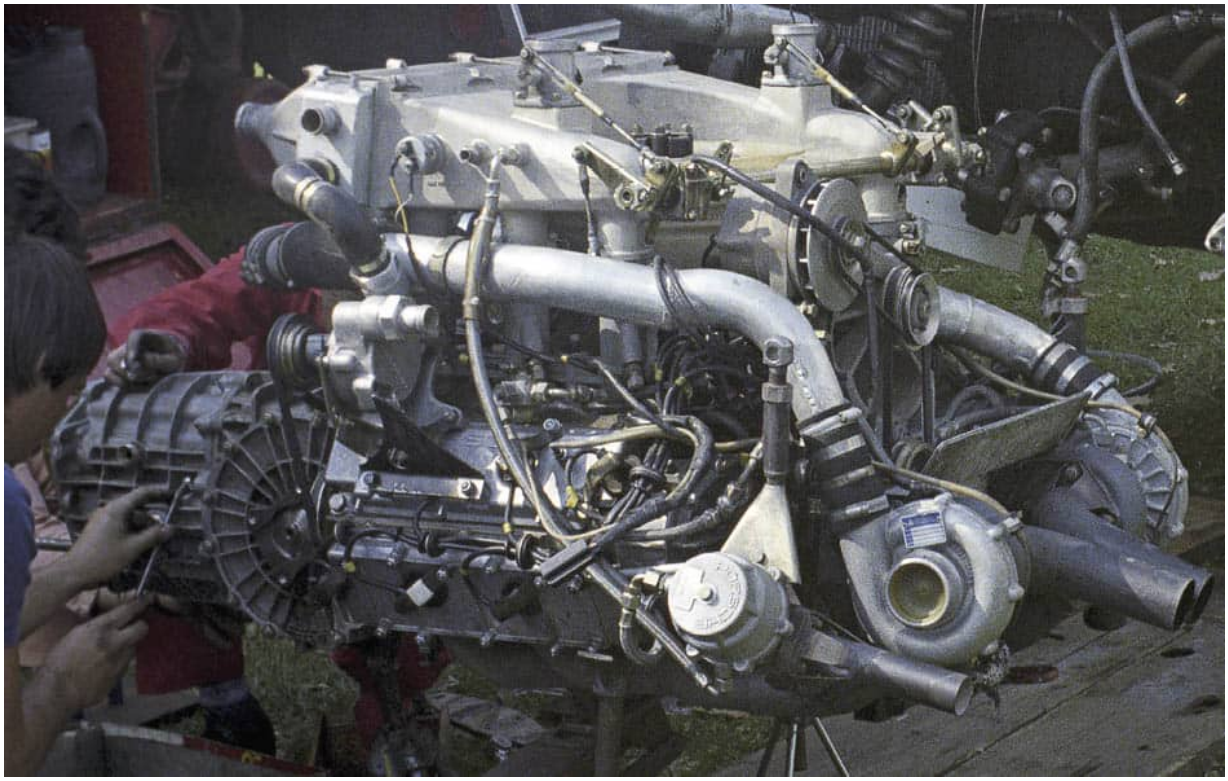
The 935 2.8-litre flat-6 turbocharged unit: 590bhp could be obtained with this engine in 1976. (P)



The 936 twin-turbo race engine of 1977. (P)



Type 935/78 3.2 water-cooled engine, partially built for the 935 (designated ‘Moby Dick’) long-tail car with 750bhp. (P)



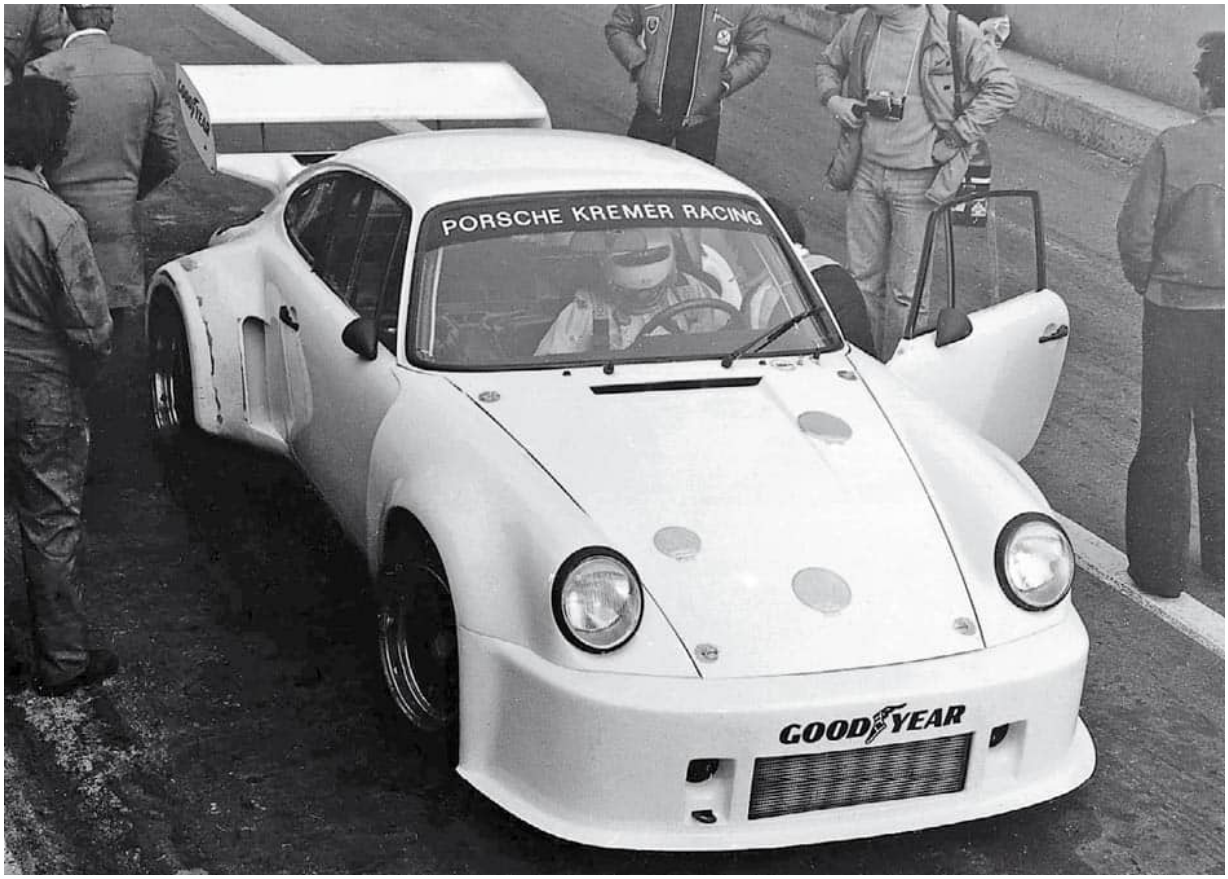
A type 935/77A seen at the Norisring in 1978. (P)

Kremer-Porsche – Part 1

Erwin Kremer started racing back in 1966, first with a Lotus Elan but very soon after with a 356 Porsche. Between that time and 1974, when he decided to concentrate on the business, he made 66 starts and took four victories, all but one in a Porsche.

Based in Cologne in north western Germany, the Kremer brothers, Erwin and Manfred, were to become legendary. The story of the Kremer Porsche racing company begins in 1973, when the Kremer brothers started to specialise in the preparation of Porsche 911s. Of course, they had been running Porsche 911s since 1968, but these were all Porsche-supplied vehicles that the Kremers would tune to their own specification. They also ran a Porsche 914 in 1971, along with the 1971 RSR and the 911T. The Kremers specialised in power, the tuning of the engine, achieving some remarkable results. It is in 1974 that we see 911 RSRs appearing in the records under the specification 911 RSK. A new Kremer version RSK (in this case K for Kremer) was presented to the press in the new Kremer workshops in

Cologne's Robert Perthel Strasse in early 1975. Whilst the 911 RSRs and the 1974 RSKs had a front skirt in pretty much the standard form, at the 1975 opening races at Monza an American-style IMSA air dam, wrapping round the front of the car, was to be seen. It was immediately protested by Kremer's competitors, in the first heat of the 300km race! For heat two they had to revert to the standard form of front bumper. That innovation was a sign of things to come, when the Kremer team, ever inventive, would constantly try new ideas. The RSRs had a 2808cc engine giving around 300bhp, the RSK of 1975 featured a 2994cc engine with 330bhp.



Manfred Kremer tries out the first 935 K1. This car could be called the 'Grandmother,' the start of Kremer's own-car production. The 935 K1 would race eight times in 1976, achieving one win and two 2nd places.

Always testing, here with wing and body modifications; many aero details were attended to as the K1 was being developed. (P)

In the meantime, Porsche itself had been experimenting with updated turbochargers; on the factory cars these had already been seen on the RSR. 1976 saw the arrival of the 934 for the Group 4 class GT, and the 935 for the Group 5 Special production. The Group 4 car was a 2994cc 480bhp turbocharged car featuring the K26 KKK turbo.

Whilst the Kremers were more and more going their own way, they still frequently used Porsche ‘white bodies’ (standard model type bodyshell), but then heavily modifying the chassis, body and the power unit. The first result was the 935 K1, a car that was still pretty much Porsche, and from the factory. However, during various tests K1 would become more and more a Kremer machine. In 1976 the Kremer 935 K1 was developing around 635bhp. The first K1 carried a Porsche chassis, ref 006-00019. The Kremer 935 K1 had its first

race at Mugello on 21 March 1976, when Hans Heyer/Bob Wollek drove the car to 2nd place behind the Martini Racing factory 935 of Jochen Mass/Jacky Ickx.

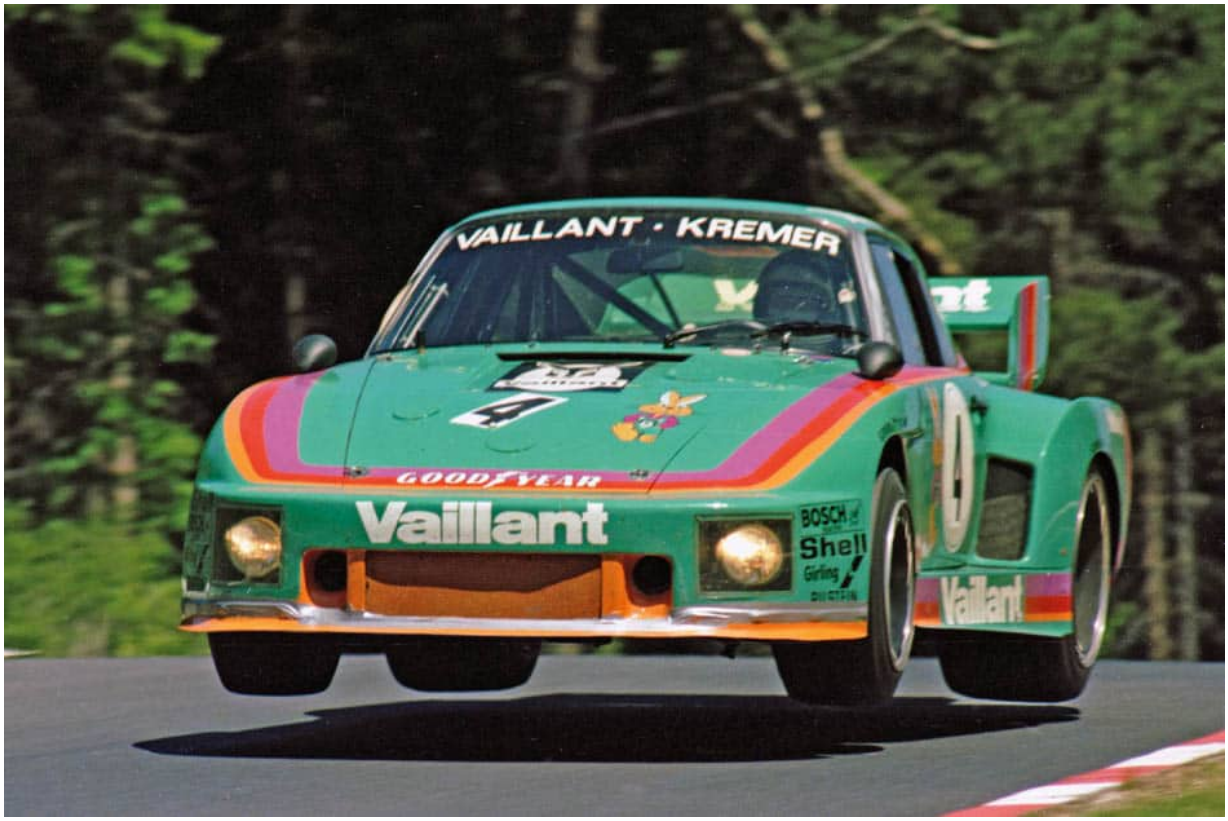
In 1976, the K1 Kremer-Porsche took four 2nd places and one victory, proving from the word go that the Kremers, now at international level, were a force to be reckoned with. The K1 (006-0019) would race on in 1977, but already the brothers had acquired another chassis to develop the 935 007-0004. Again, this was a basic 935 as it left Porsche, but once in the Kremers' hands it became the K2. This car would be painted all over green and started to feature new aerodynamic thinking. Kremer Racing moved to the next level.

By the time of the 1000km of the Nürburgring on 30 May 1976, the car would appear in Vaillant livery, a cooperation that would last a long time. Hans Heyer/Bob Wollek. (P)

The K2 was more powerful: 670bhp as opposed to the 635 of the

K1. This would see the K2 take five victories in the German Championship series. The 935 K2 would race on into 1978 and 1979, but the Kremer brothers also used a 930-type flat-fronted 935, which would lead to the development of the next car – the K3. Porsche had brought out a new model, too: the spectacular 935/78, so called 'Moby Dick.' It would prove to be super quick.

During 1978, Porsche decided to cease development of the 911/935 Group 5 car, but the customer teams like Kremer in Europe, along with the John Paul team and others in the USA, would carry the flag of the 935 well into the 1980s. Achim Stroth was for a long time deeply involved with Kremer. He had joined Kremer in 1974, acting as the sports director at the national Belgium races (running in the championship there for Camel Belgium with a Belgian driver.) Stroth says: "I had first met the team in 1973, when they asked me to translate the contracts with Camel, and I was with them in Brussels to assist with negotiations; after that, they invited me to join the team full time. From then on, I did all the Le Mans races until 1998, and most of the German championships. 1979 at Le Mans was great, with two Kremer cars on the podium."



The more powerful (670bhp) K2 935 at the Nürburgring 1000km, 29 May 1977: Bob Wollek/John Fitzpatrick, a group 5 car stated in Kremer records to be chassis 007 0004. The car finished 2nd overall. (P)

The 935/78 'Moby Dick' factory development, seen here just after roll-out at the Porsche factory. (P)

Achim goes on to tell us: "Whilst all the homologated cars, like the Group 4 and Group 5, had factory 'white' bodies, Kremer would build many space-frame (tube-frame) 935 chassis over the period to equip the bodies. Even a 917 and a 936, built from Porsche factory-supplied drawings and specifications, were created. The 935 K series – K1, K2, K3, K4 – were ostensibly cars with extensive Kremer modifications that became more modified as the K numbers increased. With these came the space-frame replicas."

It might be interesting for the reader to know that the Porsche factory also produced 13 'replica' 930-935 single-turbo cars, chassis numbers 930 770 0901 to 930 770 0913. These were built to be sold to private customer race teams such as Alan Hamilton Porsche in Australia. 930 770 0904 went to the Kannacher team. 0905 went to Gianpiero Moretti (Momo) to race in IMSA. 0907 found its way to Franz Konrad. Racing driver George Loos had 0908 and 0911. 0909 went to Peter Gregg's Brumos company in the USA, where it was

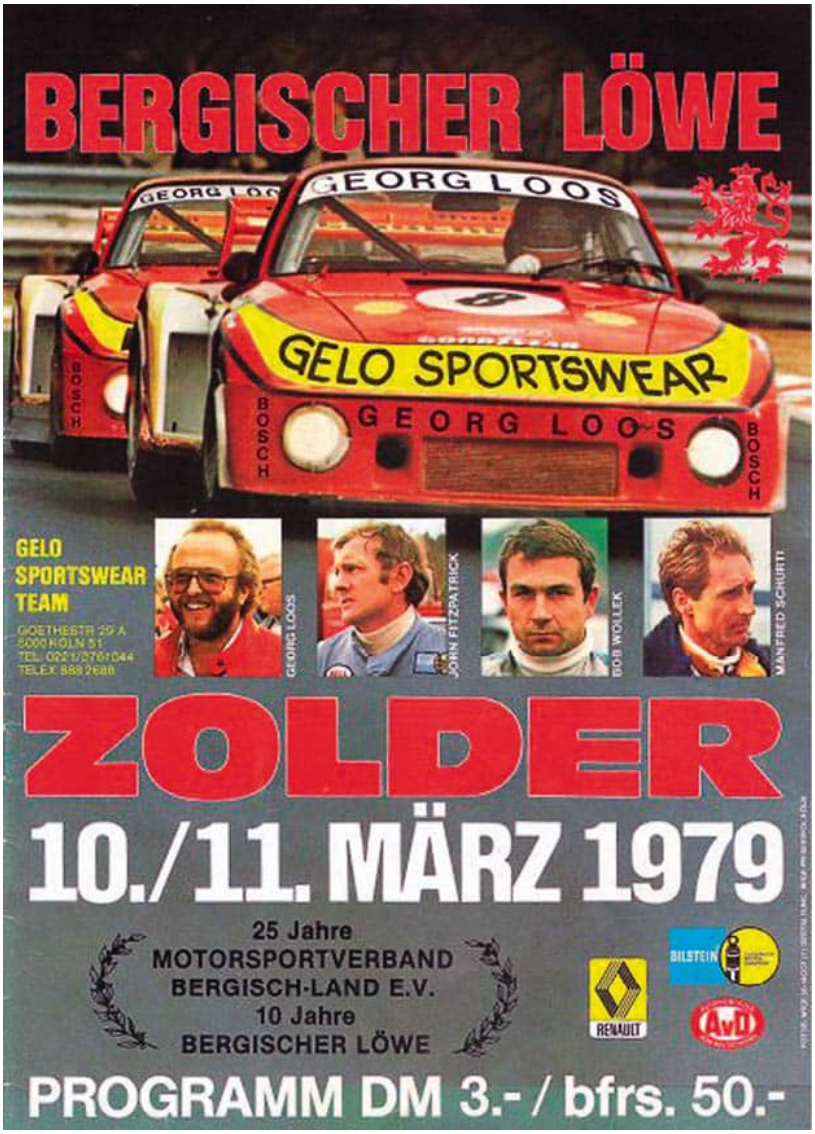
promptly stripped to use the parts in Gregg's 934; it was later rebuilt by Brumos crew chief Jack Atkinson. 0910 was supposed to go to Peter Gregg but instead was sold to Jim Busby in the USA, who added an extra turbo (it went on to win the 1979 Sebring 12 Hours). 0912 changed hands a few times, passing through Kevin Jeannette's Gunnar Racing team at one point. 0913 went to US distributor Vasek Polak, and on to Ted Field (Interscope). (Source: various existing 930/935 studies by Barth, Starkey, Ludvigsen.)

For those who may be interested, we find one of those strange circumstances regarding a chassis number – the Kremer K2. Which was it really? In the Kremer records, it is 935 K2 007 0004, but in one excellent book on the 935, this K2 car is listed as 930 7700903; the 930 7700903 also appears in another eminent work. Fortunately they all have the same race recorded positions. Achim Stroth says: "Kremer records state that 0070004 raced in the Nürburgring 1000km in 1977, and, looking at Kremer habits, it would be a surprise if Kremer raced their second K2, 930 7700903, two weeks ahead of the 24 Hours!"

In 1977/8, the Kremer cars were already well known in the USA. In Europe, Kremer had also started supplying customers, Max Moritz Racing for example, with 911 RSRs, and in 1974 journalist and well-established racer, Eckhard Schimpf, who had driven the 914 Porsches under the Jägermeister colours, got involved in racing with the Kremers, also in an RSR. Schimpf was a member of the family that ran the Jägermeister drinks company; it was already involved in sponsoring the BMW in the German Touring Car Championships when Schimpf brought the Jägermeister sponsorship to the Kremer company, so let's hear from Eckhard Schimpf about Jägermeister:

"You know, there are always cars which play an important role in a person's life. For me, this was the Porsche 914/6. The Roadster and its concept fascinated me on its debut. I didn't have money at the time. But I had borrowed a standard Porsche 914/6 from the Porsche dealer Voets in Braunschweig, and competed at the Monte Carlo Rally. My cousin Günter came to see me – he had been the CEO of Jägermeister. I wanted 500 marks for racing and offered to place Jägermeister stickers on the Porsche. He gave me 1000 marks!

Sadly the ‘Monte’ ended for me in a pile of snow. Our conversations afterwards, though, would lead to the founding of the Jägermeister Racing Team, which I would manage until the year 2000. Those early forays and the decisions that followed formed the backbone to the start of the Jägermeister Team sponsorship program and our work with Kremer.”



(JS)

The Kremer 935 version K3 as it was introduced to the press in a presentation at Hockenheim in 1979. This one is chassis 009 0002, powered by a Kremer-tuned, twin-turbocharged Porsche 3163cc engine giving around 805bhp. (P)

Kremer Racing's 935-K3 009-0002 took victory at Zolder, Hockenheim and the Salzburgring in 1979, Klaus Ludwig claiming all three wins. It would end in a Championship victory with 11 wins in 12 races. (P)

Bill and Don Whittington dug deep into their pockets, feeling that they had something special. They lured Klaus Ludwig to join them. The flat-six 3-litre would take an overall first victory at Le Mans for a Kremer-built car. (P)

The legendary K3 was to win its first race in the hands of Klaus Ludwig at the Bergischer Löwe Zolder meeting on 10/11 March 1979. 935 K3 chassis 009 0002 finished ahead of 19 other finishers, in a race which included many of the serious drivers of the period: Fitzpatrick, Schürti, Stommelen, Wollek, etc. On 8 April, Ludwig repeated the victory performance at Hockenheim, then again at the Salzburgring in Austria on 10 May, though it 'only' managed 2nd at the Nürburgring 1000km, the Group 5 car being pipped by one of the three Loos-entered 935s, when the Kremer car suffered gearbox problems on the final lap. In 1979, the Kremer K3 went on to win 11 of the 12 German Championship series races. Kremer was to build another 935 K3, chassis 009 0015, to run at Le Mans in 1979 in the

hands of German driver Klaus Ludwig, and Americans Bill and Don Whittington. It was a Kremer tube frame, featuring a widened and lengthened body constructed of lightweight Kevlar. This car was an advancement over the previous versions. Aerodynamics were beginning to be understood, though Kremer had no wind tunnel. One former member of the team says: “We used the Cologne Autobahn!” In testing this car proved to be very quick, and US racers Bill and Don Whittington dug deep into their pockets, feeling that they had something special. They paid for Klaus Ludwig to join them. The flat-six 3-litre would take a first overall victory at Le Mans for a Kremer-built car, the team also taking 3rd with a Kremer 935.

The Kremer 935 ‘replicas’ – some said kit cars – were in big demand, and by using Kevlar bodywork over a space-frame tube chassis they demonstrated an advantage, weight-wise. The Kremer ideas were now a long way from the original Werks cars. Their engine also featured an air-to-air intercooler, fitted in a manner that was by then satisfactory to the regulations, Porsche itself having been banned from using such a device in 1976. The next all-Kremer car, still powered by Porsche, of course, we will hear more about in our next chapter as we go into the 1980s. Porsche had stopped building the 935, in anticipation of new rule changes by the FIA for the near future. They would be ready when the change came with the type 956.

♦ ♦ ♦ ♦ ♦

KMW-Porsche

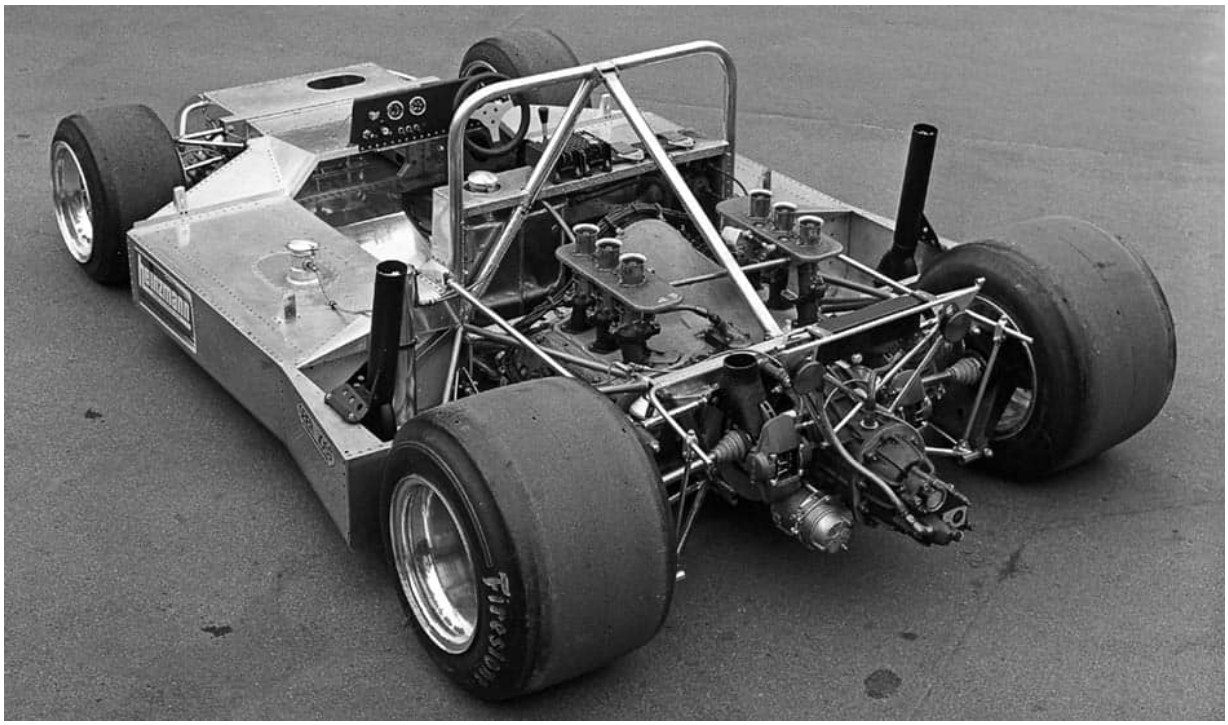
Whilst Kremer was causing a stir amongst the Sports GT Car racing fraternity with its 935s, several designers and racers were tempted to enter the fray with other ideas, like the Sports Prototype series, the Interserie, a sort of European version of Can-Am. One such would be a Sports Prototype car created by Jo Karasek, a well-known designer of various categories of racing cars. With the KMW-SP2 sports car, he created a tiny but mighty car, just 3.5m (140in) long, and weighing in at less than 500kg (1100lb). Its potential was obvious, and when a specially built Porsche 911 R engine was added

that developed over 230bhp, it had great potential to mop up in the 2-litre class. However, the competition for overall victories would come from several of the special 917s with their twelve-cylinder 5-litre 600bhp engines.

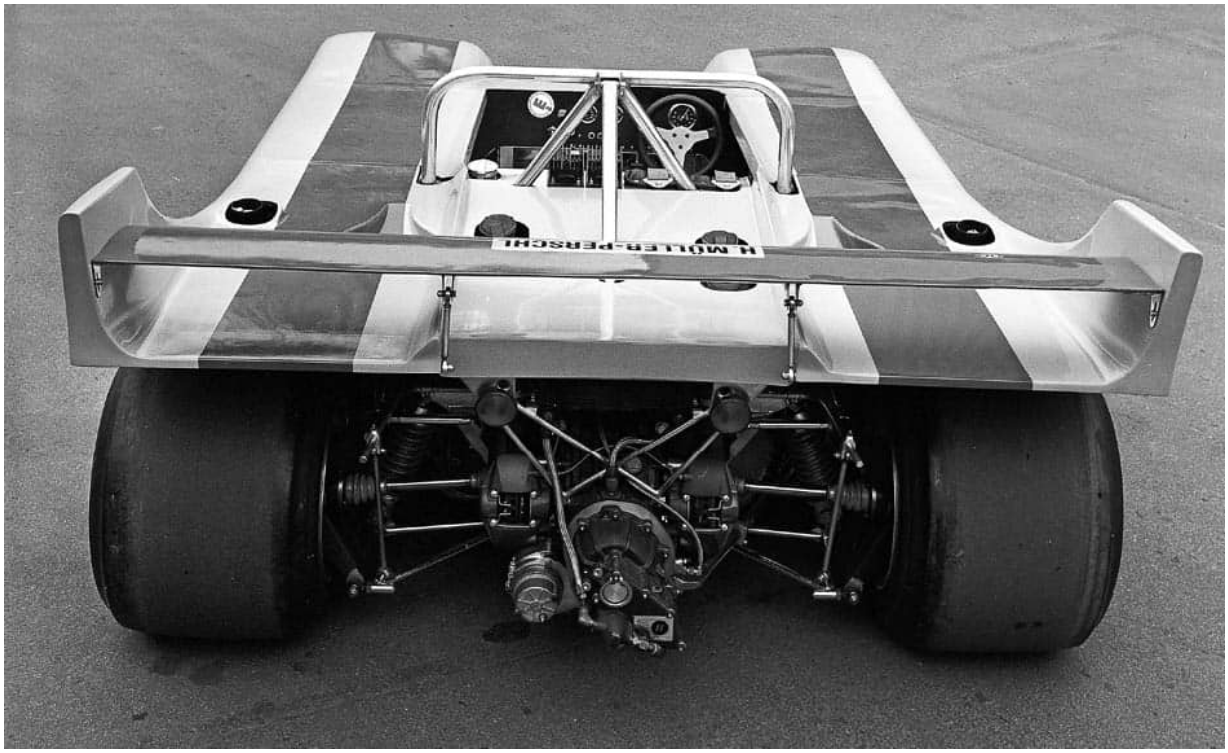
Karasek had also designed the KMW to take a 5-litre engine, the price at the time said to be a reasonable 26,800 DM. Not to be outdone, its 911 R engine was upped to 2.6-litre for racing, and later still was given a turbocharger, which of course put it in a different class; though it was a quick car, the 917 Turbo Spyders were putting out 900+bhp in the early 1970s.

The European Interserie would be the area where these cars would star. KMWs would be seen often, and with Porsche power they were generally fast and reliable, finishing races on 84 occasions in the 1970s, with drivers of the likes of Kurt Hild, Hans Müller-Perschl, Sepp Greger, Dr Siggi Brunn, etc. “Müller-Perschl was also to have the use of a very special engine – the 916/10, a six-cylinder with twin overhead cams,” says Valentin Schaeffer from the Porsche engine development team.

The Jo Karasek-created KMW. The car and its design would form the basis of many similar looking Sports Prototypes. (P)



An aluminium monocoque formed the basic requirements for a chassis that could take several engines, but especially Porsches.



The streamlined shape provided a neat, tidy, almost standard solution to go motor racing in Sports Prototypes, and KMW supplied many teams.

Conventional layout of fuel tanks in side pods, and a detachable rear part where a cradle supported the engine. (P)

Hans Müller-Perschl in the KMW SP-30, 5th at Hockenheim, 16 July 1972. His car was fitted with a special 4-cam 916/10 flat-six.(P)

In 1972, at the ISCC race on the airfield circuit of Sembach, the KMW of Kurt Hild won the 2-litre class. That early euphoria was short-lived, however: with a second car in Race 1 at the Super Sports 200 on 21 May at Silverstone in England, driver Harald Link finished 17th after 31 laps of the then 4.709km circuit. In Race 2 he managed to complete only 16 laps of the scheduled 35. Overall he was classified 11th. At this point, the car had a 2.6-litre 911S engine. The same day in the 2-litre European Championship round at the Salzburgring in Austria, Kurt Hild incurred engine problems that prevented him from starting. Things looked up for Hild in the next round, when he took the KMW SP20 to Mainz-Finthen on 18 June for the Martini International, where he finished 4th. Harald Link in the sister car failed to finish. However, Link enjoyed a better time at the Jochen Rindt Memorial Meeting at Zeltweg on 9 July, an Interserie round, where from 12th on the grid it was to be a 7th-place finish, this time in the one-race event over 34 laps. Three KMWs had turned up: Hans Müller-Pershl was best in practice (9th) and best in the race, finishing 5th overall. Kurt Hild in a second KMW was 6th.

It seems from the records that Perschl's car was to be one of the quickest: at Hockenheim, on 16 July 1972, recording a 5th in race 1 and 6th in race 2, giving him an overall placing of 5th behind two 917s, an 8-litre McLaren-Chevrolet and a Ferrari 512 M. Not bad for a 2.6-litre car. Three other KMWs were not classified. It was Harold Link's turn to finish 5th overall after two races on the 2.3 mile course at the Norisring on 6 August, over 70 laps for each event. Müller-Perschl, though, would dnf.

Harold Link in the KMW-SP30: 9th overall, Hockenheim. (P)

Kurt Hild's KMW SP-30 STP car (right) on the opening lap at Hockenheim, 16 July 1972. (P)

In Finland at the Keimola track on 27 August, Müller-Perschl is recorded as finishing 4th. Link got on the podium in 2nd place at Mainz-Finthen on 1 September. 24 September saw the Interserie circus racing on the mighty full circuit of the Nürburgring, with two races of seven laps. This time, Kurt Hild finished 8th overall, but Harald Link was back in 13th of the 17 classified. 27 cars took to the track for the Prix de Baden Württemberg on 1 October 1972; again a two-race event, this time 22 laps of the 6.789km circuit. Harald Link finished 11th overall, with Hild back in 24th of the 25 classified.

Moving on to 1973, and 1 May would see a revised KMW, the SP30, take to the track in an Interserie race at Imola. All the cars had been updated and were called SP30s and all now had 2.7-litre engines. Müller-Perschl would finish 7th, while new KMW driver Gerd Biechteler dnf'd. It was a dismal day for the KMWs at Silverstone on 20 May, both Müller-Perschl and Hild failing to finish.

The 200 miles of Nürnberg (Norisring) on 24 June saw Link finish

7th overall, but Müller-Perschl dnf'd again. Three KMWs were at the next round on 15 July at Hockenheim; all three went out in race 1 and did not appear for race 2. Müller-Perschl managed a 7th overall at Misano on 19 August at round 6 of the Championship; Link was 10th. At this race Porsche engineer Eberhard Braun was in a sister KMW SP30.

Müller-Perschl at the Prix du Palatinat race at the 'Ring, 24 September 1972; an accident on lap two put paid to his chances. (P)

3 June 1973 at the Norisring 200 Miles: the KMW of Hans Müller-Perschl (12) tussles with Jürgen Barth in the 917 Spider (23). Barth would finish 7th overall, whilst the KMW went out on lap 26.

Hans Müller-Perschl's KMW at the Hockenheim round of the Interserie, 15 July 1973. (P)

It appears according to some records that the engines were now up to 2.8-litre, and at Hockenheim for Round 7 on 30 September, five SP30s were out on the track and a sixth one with a BMW engine. However, only Hild got in the top ten at the end of the day (10th).

A KMW SP20 and an SP30 would find their way to the USA for the Riverside Can-Am races, on 28 October 1973, when the car 22 SP30

of Müller-Perschl would race to 9th overall. The SP20 car 20, also entered by Müller Motors Germany, did not get to start the race.

For 1974, at Neubiberg we find Müller-Perschl coming home 2nd; in England, at Silverstone for the Martini International, he would finish 12th overall, then at Mainz-Finthen on 2 June he finished 2nd overall. On 17 June 1974, at the Nürburgring 300km, Hild finished 12th in a normally-aspirated car, whilst Müller-Perschl now had turbo power but finished 14th – they were the only KMW cars present. At Kassel-Calden on 18 August it was the other way round, with the turbocharged Müller-Perschl 9th and Hild in the normally-aspirated car 11th.

Kurt Hild (18), KMW-SP30, 15 July 1973. An oil line failed on the second lap, putting the KMW out of the race at Hockenheim. (IW)

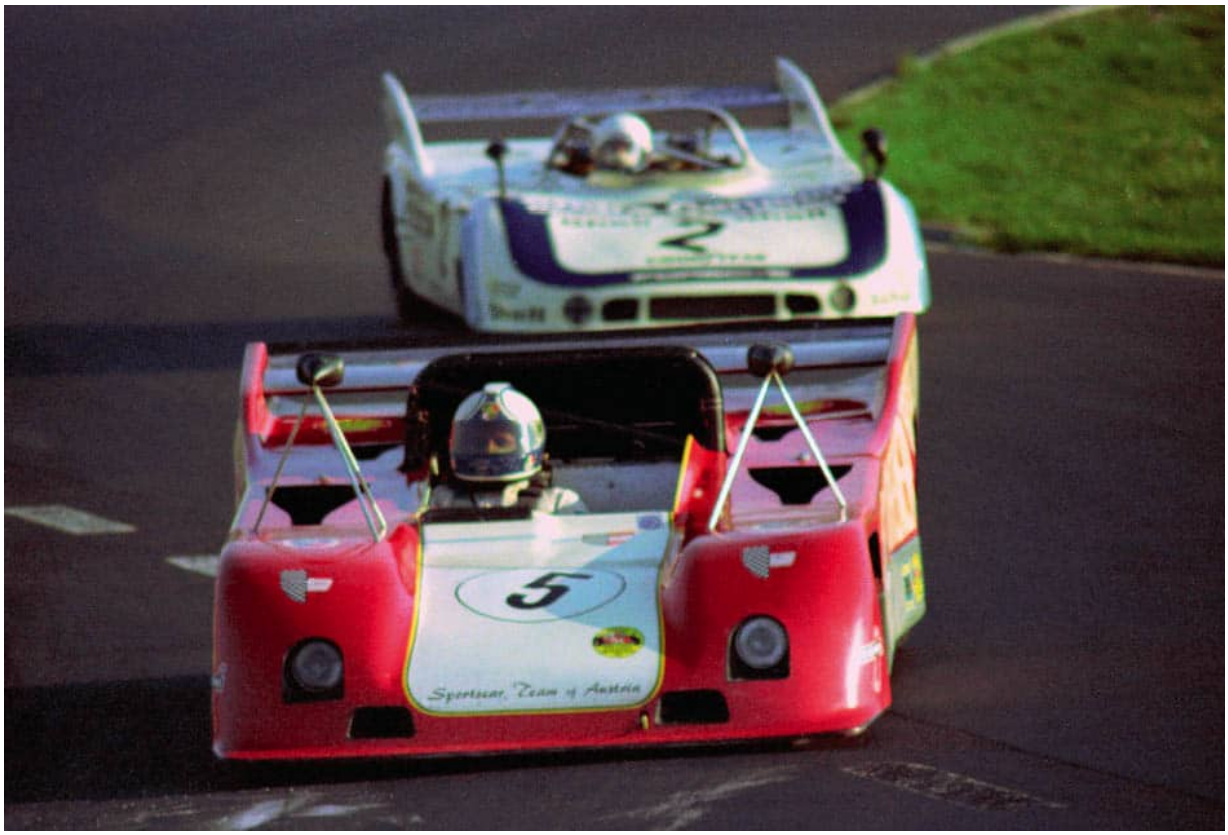
Heinz Schrieder, 8th in race 1 at the Nürburgring, 8 September 1974, KMW SP30. (P)

There would be a 6th for Hild at the Nürburgring on 8 September, with Müller-Perschl 8th. At the Coupe de l'Autodrome de Casale in Italy on 22 September, four KMWs would show. It would be a poor day at the office, with none of the four featuring in the overall classification.

At Hockenheim, however, on 29 September, Kurt Hild pulled off a great drive to finish 6th overall in the 20-lap race that had 16 starters and 15 finishers. Running all season in the normally-aspirated car, Hild finished 2nd in the Drivers' Championship, in what was called the Sports 500 class, but some 17 points behind Reinhold Joest. Into 1975, and with seven rounds ahead Kurt Hild was sticking to his normally-aspirated car. At the opening round at Hockenheim he was 7th overall, and at Mainz-Finthen 6th. At Hockenheim the former Hild car had a new driver, Dieter Dietz, who came home 10th overall in his first drive in the car, but abandoned at the Zandvoort round on 24 August.

Redlefsen Sprint, car 8 at back of this group at the Nürburgring, 7-8 September 1974. (P)

The Sports Car Team of Austria KMW SP30: Günther Eggerman at the Nürburgring 300km on 4 April 1976. (PK)



The KMW SP30-08: Henning Hagenbauer on 10 October 1976 at the Interserie ADC round at the Nürburgring, 11th overall. Sports Car Team of Austria. (P)

KMWs continued to race on into the 1980s, the original four cars growing to at least eight – maybe more. In addition, KMW was to supply bodies and parts of its cars for other constructors. Karl-Adolf Kneip was one of the last drivers to campaign a KMW SP30, as late as 1984. Kneip, a driver of long standing since 1963, appears to have acquired the SP30 in 1977. KMWs enjoyed a long life, and are still to be seen in the current Historic racing arena.

♦ ♦ ♦ ♦ ♦

Tecno-Porsche

The Tecno-Porsche was created in 1974 by Bernd Burger; originally called a Burger P3, it started life as a Tecno Formula 2 car with, reputedly, an impressive history in the hands of Silvio Moser. It is said

the Tecno chassis TOO286 was built in 1968. In Moser's hands it raced mostly in Europe, in the principal F2 races between 1968 and 1971. Like all racing cars, it was to change hands a few times, but it was when Bernd Burger got hold of the chassis that it was decided to create a sports car. The bodywork may be familiar to the reader, and indeed it is: it seems it was KMW that supplied this part of the car. At first fitted with a 1600cc engine, it was not long before this was swapped for a Porsche 911 engine, with which Burger raced the car until 1976. Then it was acquired by Karl Langjahr, who raced the car in both hillclimbs and circuit races through to 1980, regularly competing in the International FIA Interserie races. It is said that after that, the car and engine went their separate ways, until relatively recent times when the car was recovered, restored, painted yellow, and had a Porsche unit installed again. The car still exists today. Unfortunately, the author was unable to find a period image of suitable quality for publication, although pictures of the car can be seen on the web page of the Tecno register.

The Tecno as it is today restored. (TReg)

Circuit racing of the KMW-bodied Tecno-Porsche is recorded as follows:

29/8/1976	FIA Interserie: Prix des Nations, Hockenheim	18th ov, 8th Div 1 over 2-litre
24/10/1976	FIA Interserie: ADAC International, Mainz-Finthen	9th Div 1
31/10/1976	FIA Interserie: ADAC International, Hockenheim	14th ov, 7th Div 1
8/5/1977	FIA Interserie Round 1:ADAC International, Kassel-Calden	9th ov, 3rd
12/6/77	FIA Interserie Round 3: ADAC International, Wunstorf	15th ov, 6th
28/8/77	FIA Interserie Round 4: ADAC Nürburgring Trophy	12th ov, 7th
18/9/77	FIA Interserie Round 5: ADAC Ulm-Mengen	12th ov, 7th Div 1

11/6/1978	FIA Interserie Round 3: ADAC Wunstorf	10th ov, 4th Div 1
27/8/1978	FIA Interserie Round 5: ADAC Ulm-Mengen	8th ov, 4th Div 1
10/9/1978	FIA Interserie Round 6: ADAC Nürburgring Trophy	17th ov, 6th Div 1
27/5/1979	FIA Interserie Round 1:Wunstorf	7th ov, 2nd Div 1
12/8/1979	FIA Interserie Round 5: ADAC Ulm-Leipheim	11th ov, 3rd Div 1
2/9/1979	FIA Interserie Round 6: ADAC Hockenheim	12th ov, 4th Div 1
7/10/1979	FIA Interserie Round 7: ADAC Kassel-Calden	7th ov, 6 Div 1
25/5/1980	Nürburgring 1000km: FIA Interserie Class	14th ov, 8th Div

Behnke-Condor 008-Porsche

Autohaus Behnke was set up by Peter Behnke in the 1960s in the Brienner Strasse, Munich, Germany. They were an importer of Lotus cars in Germany in the period. In time, Behnke decided to create his own cars, and initially the design leaned heavily on that of the Lotus and in particular the Lotus 23. Numerous engine/gearbox combinations were tried over the years: Fords, Alfa Romeos, BMWs, even DKW, but in the case of the Behnke-Condor 008, the 2-litre Porsche Carrera 6 engine would be the chosen one. As with the engines, Behnke tried several gearbox combinations, including the Italian Colotti, the British Hewland, and, of course, the Porsche. The author has not been able to establish exactly how many Porsche-

powered Condors were created, and it is understood that not all chassis were delivered race-ready, customers frequently finishing the cars off themselves with various combinations of mechanical parts and bodies. It is thought, though, that around 17 Behnke Condors were built between 1966 and 1978.

Georg Moritz (no relation to the Max Moritz Racing Team), who would be racing cars from 1963 to 1988, acquired the Condor 008 in 1970, and at first used an Alfa Romeo engine. 1971 proved to be quite a good year, but also included several non-finishes. He then decided to acquire the Porsche engine for 1972, entering six races of regional and national status, but struggled to finish above 5th, and again endured several non-finishes. His first outing in 1973 took him to Zolder on 22 April, resulting in a 3rd on the podium in the 2-litre race. A dnf followed at Sembach on 5 May. Up to this point it was Georg himself doing the entry, but at Mainz-Finthen on 1 July he was entered under the MSC Gottlieb-Daimler title, finishing 4th in the 2-litre class. At Niederstetten on 8 July he took the Condor Porsche to victory in the 2-litre class. He entered the International Interserie Round 5, the South West Cup at Hockenheim, Germany, on 15 July 1973. Moritz took 7th place in the S2 (up to 2.5-litre) class in race 1 of the two-race Interserie Championship round, then 5th in the 2nd race, leaving a final classification overall of 7th in S2.

Hockenheim, July 1973: the Georg Moritz (83 in the background) 2-litre Condor Porsche C008, just behind the 917/10 of George Loos. (IW)

The Motor Sporting Club Gottlieb Daimler entry of Georg Moritz, 7th overall in class S2 (up to 2.5-litre) in race 1 and 5th in race 2, leading to a 7th in general classification in S2. Hockenheim, July 1973. (IW)

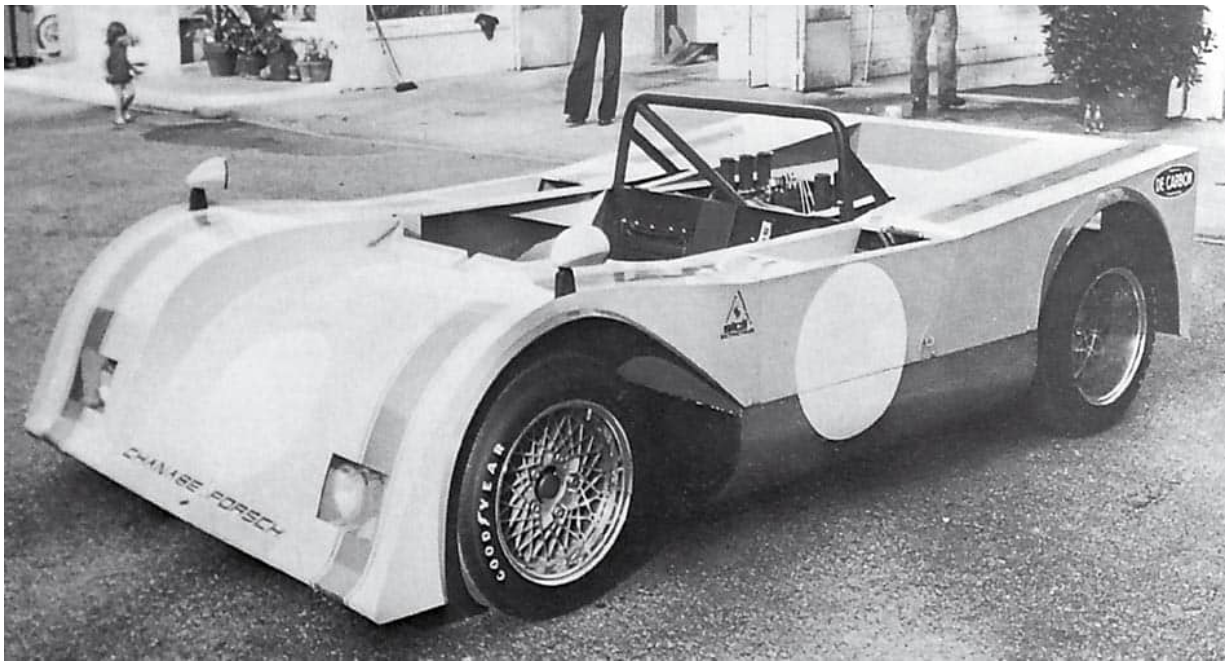
The next outing of the Condor-Porsche was also at Hockenheim on 26 August, when, in an AvD national race, he finished 7th. Round 7 of the 1973 Interserie Championship was also at Hockenheim, this time on 30 September. Finishing 2nd in Class S2 in the first race and 4th in the second race, Moritz finished 3rd overall. He continued to race the Condor-Porsche until the end of 1975. There were a number of dnfs in 1974, but he came 2nd at Sembach on 12 May, and won the Hockenheim Season Finale racing weekend Race G for 2-litre cars. In 1975, on 31 August, he ran the Condor for what appears to be the last time, in the European 2-litre Championship round, once more at Hockenheim, finishing 18th in Race 1 and 11th in Race 2, resulting in an overall classification of 14th.

♦ ♦ ♦ ♦ ♦

Chanabé-Porsche

French motorsport journalist, Jean-Luc Taillade, went to see the original car in 1973; this is what he said at the time: “Jean Chanabé works in his father’s Porsche and De Tomaso agency in Toulouse. Mr Charles Chanabé was well known in motor racing circles in the area as he was track director at the Albi circuit and frequently Clerk of the Course for hillclimbs in the Albi area. Jean Chanabé wanted to create a car of his own; we think the first effort resulted in Chanabé CH1. The car, carefully drafted on the drawing board during 1971, was to see the light of day in 1973. This was of course not a big-budget creation, but it was a serious study in which nothing was left to chance from the safety and reliability points of view. Every effort was made to keep the weight down and strength up. The chassis of the Chanabé CH2 was a development of the CH1, made from square-profile steel tubing, welded in a rare gas atmosphere and boxed in by riveted aluminium panels, a style typical of the period. FIA specifications were followed during the construction. The CH2 front suspension was constructed from unequal triangles, in special high-resistance tubing, mounted with spherical joints. The De Carbon shock absorbers combined with the springs have adjustable trim and adjustment power, the anti-roll bar of course being adjustable, and rear suspension adjustable in all directions. Braking on the original car was by ventilated discs at the front and plain at the rear. Power is, of course, Porsche, in this case the flat-6 1991cc fuelled by Bosch indirect injection, supplying 190bhp at 7500rpm. In the early days this was the test engine, but the Chanabé CH2 was designed to receive engines producing up to 350bhp, and a Porsche 5-speed gearbox. The wheelbase on this almost home-built special is 2.24m, front track 1.6m, rear 1.57m, height 81cm at the highest point of the body, and 98cm with roll cage. Length is 3.28m, and width 1.9m, and weight 580kg.”

The Chanabé-Porsche in recent times, now restored, seen at the Solitude race circuit Old Timer meeting near Stuttgart, Germany. (P)



The original Chanabé CH2 in period, built by Jean Chanabé at his father's Porsche dealership in 1973. (JLT)


CEUX QUI BRICOLENT

la barquette chanabé.ch 2

The interview and article by Jean-Luc Taillade, 1973. (JLT)

The car now has a Porsche 911 engine 901.10, 2500cc with 260hp/7500rpm via Porsche 5-gear 914 magnesium racing transmission ZF limited-slip differential. The author was unable to establish if this car raced in period, as all the usual sources drew a blank.

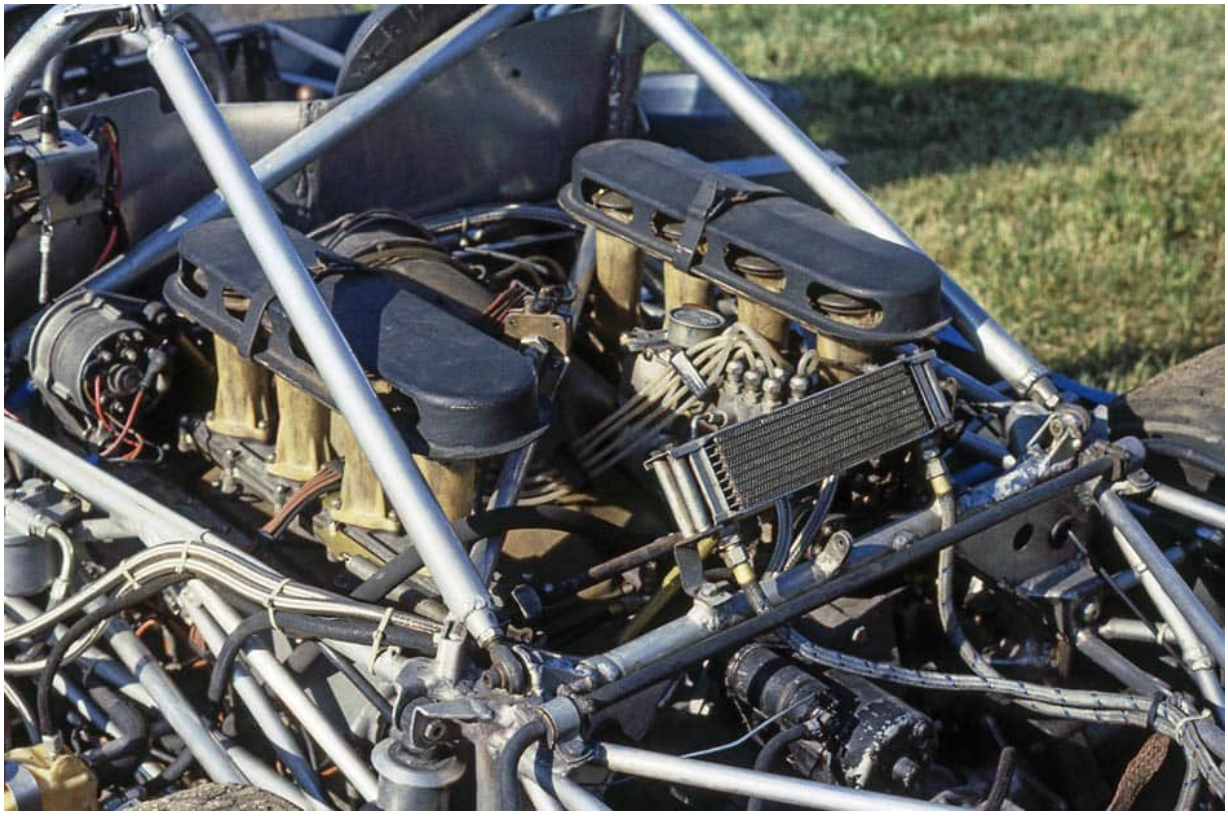
♦ ♦ ♦ ♦ ♦

Deutsch-Porsche

The Deutsch-Porsche originally came from the Porsche racing department in May 1969 as a Porsche 908/2 short-tail, chassis 018, and entered by the factory in June for the 1969 Nürburgring 1000km, where the car came 2nd overall, driven by Rolf Stommelen/Hans Herrmann. 018 was then sold directly by the racing department in October 1969 to regular racing customer Karl von Wendt for his BG Racing Team. In January 1970 it went to Buenos Aires for the 1000km race, and a week later the Buenos Aires 200 Mile race, driven by Willi Kausen and Herbert Schultze; it dnf'd in both events.

Back in Europe, in May 1970, it was raced at the Nürburgring 1000km by Karl von Wendt/Gerhard Koch, finishing 7th overall. In June 1970, after the Nürnberg 200 Mile race, the car was sold to Guillermo Ortega and his Ecuador Marlboro Racing Team. In September 1972, at the 12-hour Marlboro Race at Yaguarcocha, Ecuador, Ortega crashed and damaged the car. It went back to the Porsche factory for repairs, but the damage was so extensive and costly to repair that Ortega put the remains up for sale; it was acquired by one Kurt Lotterschmid. It was then sold on to August Deutsch of Germany, who sent it to be repaired by Lehman-Tuning in Lenggries. Deutsch then began to race the car through 1975 and 1976 as the 'Deutsch-Spezial,' known for its special bodywork designed by Felix Gmachmeier. The engine installed was said to be a 908 flat eight-cylinder 2997cc Porsche, though some records show that in 1975 it had a Rover V8 3.5 engine before the Porsche unit was installed. On 9 May 1976, the now Deutsch-Porsche ran in the Interserie race at Kassel-Calden, finishing 11th in the Division 1 race. At the Zolder Interserie it was 11th. At Hockenheim on 29 August it came 9th, having been 6th in heat 1 and 5th in heat 2 of the Division 1 race. Various drivers drove the car in 1976 – Lothar Shorg, Hans-Peter Plöderl, Kurt Lotterschmid – with varying results. In the early part of 1977, the car ran in practice at the Monza 500km on 23 April, but, although it qualified 32nd on the grid, it failed to make the start! Interestingly, it then shows up in North America, non-finishing at the Mont-Tremblant Can-Am race, but taking 11th overall at the 6 Hours of Watkins Glen, driven by Gary Hirsch. Several non-finishes followed before the car returned to Europe. It was returned to its more conventional 908-style body in the early 1980s, and raced on in Europe through to 1986.

The Deutsch-Spezial at the Zolder Interserie with Hans-Peter Plöderl at the wheel, 13 June 1976; it came 11th overall. (FO)
908 flat eight-cylinder 2997cc Porsche. (MW)



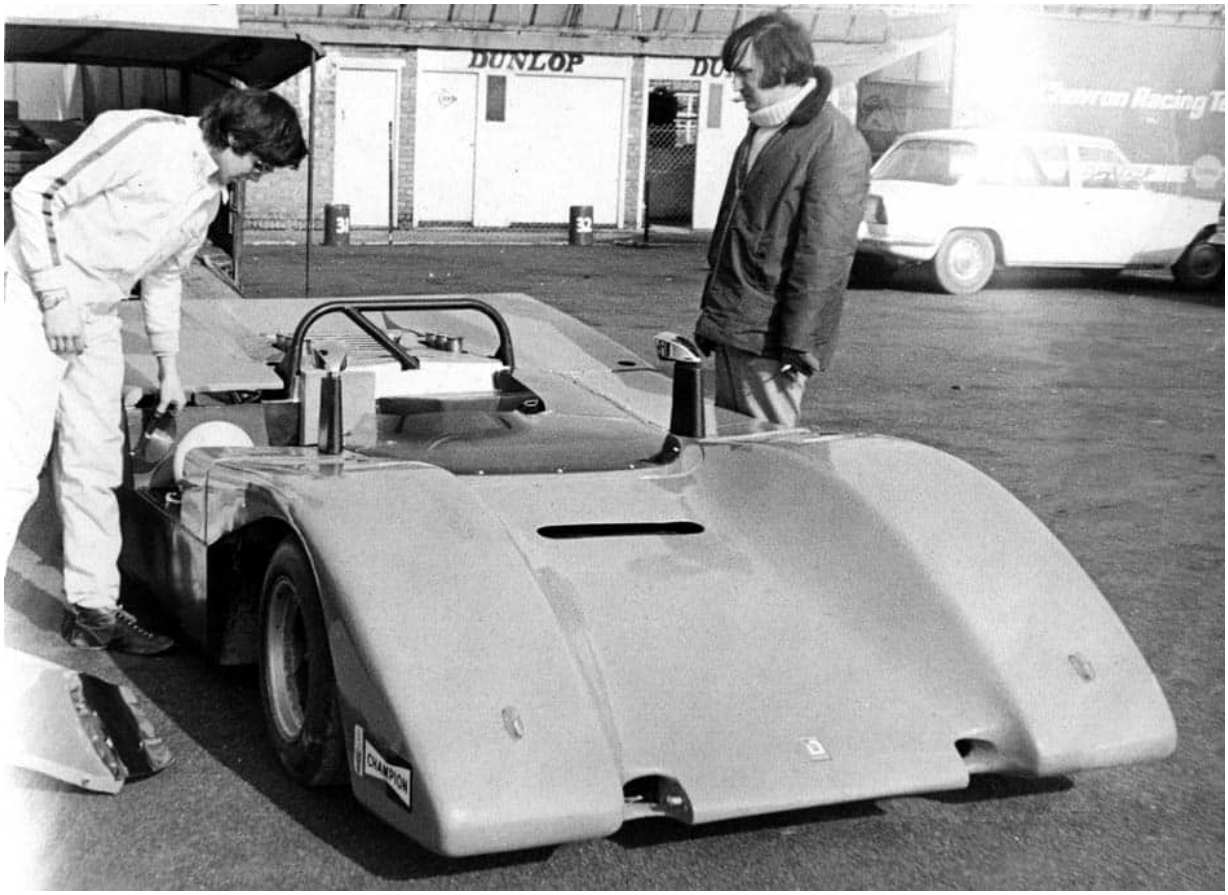
The Deutsch-Porsche in Can-Am trim. The chequered-career car raced in Europe and North America, thought here to be at the Charlotte Can-Am race, driven by Gary Hirsch, 27 May 1978. It suffered engine failure on lap 25. (MW)

Kurt Hild driving the Deutsch-Porsche at Thruxton (UK) Interserie round, 1986. (NV)

♦ ♦ ♦ ♦ ♦

Dulon-Porsche

The reader may know the 750 Motor Club in England. This organisation dates from 1939, when it was set up for the purpose of providing an organisation for owners of the 750cc Austin 7 cars for trials, road rallies and eventually racing. The club has a section that still caters for those early cars but since then, and especially in the 1950s and 1960s, proved to be the breeding ground for many of the motor racing world's great designers and engineers. If you wanted to learn how to build a race car and race it, the 750MC was the place to be. Colin Chapman and Tony Southgate, to name just two of the greats, were active in the 750MC. On a more humble note, even this author was involved as secretary of one of the 750MC centres in the late 1960s. Today the 750MC provides some of the most innovative and creatively designed cars around, and the racing is simply second to none. So it will be no surprise to see that Dulon was born within this arena. Andrew Duncan (the 'DU' of Dulon) and Bill Longley (the 'LON') started up the Maxperenco Products Company in 1967/8. They had created a very handsome road-going sports coupé in 1968, and, started building racing cars, the first being the LD4 Formula Ford. It was the start of a production of dozens of cars that provided the backbone of Formula Ford. Single-seater production continued through the 1970s, and during the period driver Ian Taylor won several championships in a Dulon, against formidable opposition. Longley left the company to pursue other interests in 1972. Dulon had already built a few sports racing cars. Based on a central steel tub with space-frame arrangement front and rear, it was designed in order that the whole rear end, engine and gearbox, complete with suspension, could be removed in one piece. The Dulon LD11P was powered by a Porsche flat-six. Some 190 Dulons, both single-seaters and sports cars, were built before Andrew Duncan called it a day and moved on.



The first tests, Silverstone 1971; Martin Ridehalgh (left). With Les Margetts of Dulon, saloon car racer Bill McGovern assisted with the shakedown of the new Dulon Group 6 Prototype. (KM)

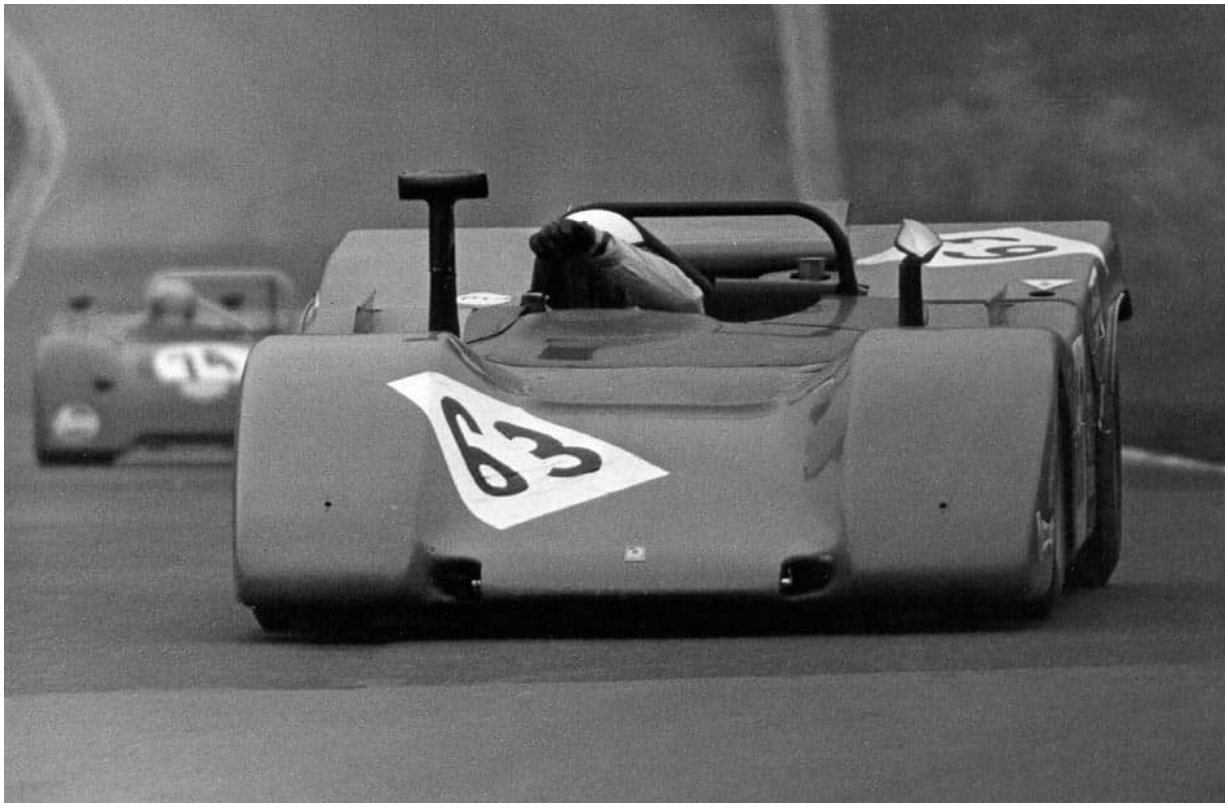
In 1971, Martin Ridehalgh was looking for a new car to race. Martin Ridehalgh: “I started racing in 1965. I had a friend with whom I was at school who was a little older than me, and who set up his own race team in Abingdon (Roger Heavens Racing) in the early 1960s. My first race was in Roger’s 970cc Cooper S at Lydden Hill race circuit, where I amazed myself by qualifying in 2nd position. I think I came in 5th, but was pleased with my first attempt. I then entered the British Saloon Car Championship with a Mini Cooper 1275S, and also started to do long-distance races with the Cooper as a 1300cc prototype. In parallel with these activities I was also doing work with Maxperenco Products of Didcot, designers and manufacturers of Dulon race cars. I helped to run Eddy Cheever for a season to get his international licence in a Dulon before he moved on to his F1 period.

“I was approached by Chris Maltin, who was a Porsche racer and garage owner. We set about designing and building the Dulon Gp6 prototype car with Andrew Duncan and Bill Longley; Les Margetts made the body. The car was specifically aimed at the Group 6 World Sports Car Championship 2-litre class, where the races were mainly 500km, 1000km or 6-hours, so endurance and ease of driving were the construction criteria.

“After testing the car at Silverstone in early 1971 with Bill McGovern co-driving, I started the season in March at the banked Montlhéry circuit near Paris. There was a lot to learn, even though the Dulon was and is a relatively easy car to drive. The Porsche power unit had a similar power output to the Ford FVCs, but a much smoother torque curve. This was especially beneficial in wet racing as power/torque were smooth and easy to manage. All development was down to driver and engineer head-scratching to make alterations to roll bars, spring rates, gear ratios, dampers, etc!

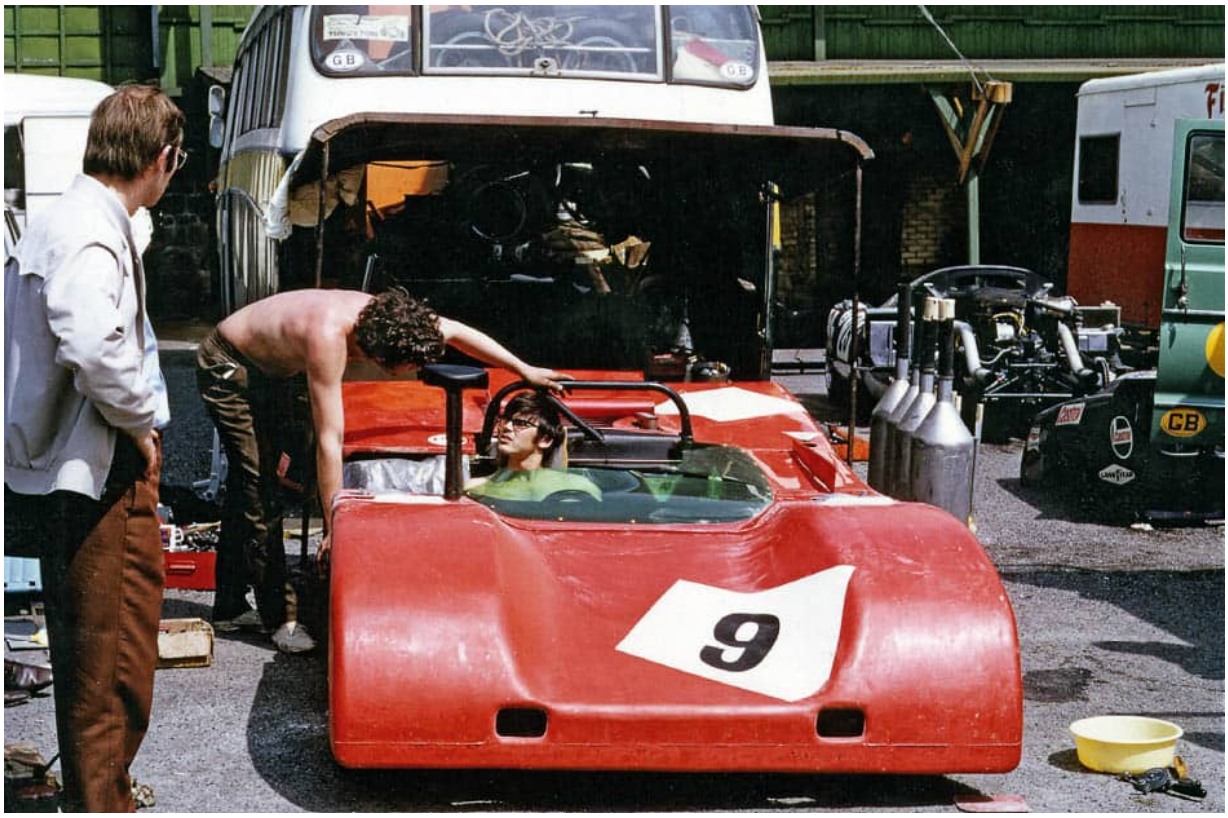
“We were racing at the end of the time when privateers could compete alongside the works teams, and although we had been with other cars before the Dulon, racing on a very limited budget, we managed to travel to circuits around Europe, including all the UK ones plus Montlhéry, Spa, Vila Real, Jarama, Montjuich. Many of the other privateer teams did the same as us, travelling and living (hand to mouth) in the car transporter. On 4 April 1971 at Brands Hatch, we were running reasonably well until a driveshaft seized while Bill was driving. This forced the car into a spin which unfortunately collected Jacky Ickx’s Ferrari. From then on we were known as Porsche’s ‘secret weapon.’”

Driveshaft failure at Brands Hatch forced the car into a spin, making contact with Jacky Ickx's Ferrari. From then on the car was known as 'Porsche's secret weapon.' (KM)



Some laps into the race: the Dulon LD11, Bill McGovern at the wheel, ahead of eventual Proto 2-litre class-winning Dobbie Racing Chevron Ford of JJ Miles and Graham Birrell. (KM/David Beard)

At Spa for the 1000km on 9 May, Martin Ridehalgh was accompanied by Ian Taylor; they qualified 23rd on the 28-car grid. All was going well until 40 laps into the race, where Jacky Ickx and Clay Regazzoni, in their Ferrari 312 B, were struggling to keep up with the 5-litre Porsche 917s. Martin Ridehalgh says: “It was our first visit to Spa, where we had a major accident with Clay Regazzoni!” The report of the race says: “The fine drive of the 3-litre Ferrari ended when it tangled with the Dulon, the exact same fate that befell the same two cars at Brands Hatch.” Maybe it was the magnetic attraction of Regazzoni!



The Dulon at Spa Francorchamps, 1971. Practice went okay: 23rd on the grid, 5th of the Sports 2000s. (KM/Brian Joscelyne)

Ridehalgh: “We brought the remains back to the UK, rebuilt the car and were at the Nürburgring only three weeks later, thanks to the support of Dulon and my mechanics.”

Speedy work saw the Ferrari-bashing Dulon at the Nürburgring on 30 May. But the school of hard knocks was still active, and after qualifying 47th of the 53 starters at the Nordschleife on a rare warm and dry day, the Dulon lasted only four laps before engine failure caused its demise while it was being driven by Hervé Le Guellec. Martin Ridehalgh again: “My competition days in the Dulon sadly ended prematurely at the Nürburgring when the Porsche engine threw a conrod, which virtually cut the engine in two. The expenditure had become astronomic. I had no funds to rebuild the car, and so from 1972 until 1981 it was stored in my garage until an old friend, Keith Martin, rang to ask if he could buy the car. He rebuilt it and it now competes very successfully in Historic Sports Car races, often

winning its class."

A nice footnote to this story was told to the author by Keith Martin: "I purchased the car from Martin in April 1981; I had an eye on the burgeoning Historic movement, even though, technically, the car was still current to Group 6 spec.

"The rebuild took a lot longer than the three weeks Maxperenco took originally. Luckily, they were still in business then, and mechanics Andy and Bert were most helpful with making new parts, advice, setting up, etc. I raced the car on and off at international Historic events between 1991 and 2006, winning class championships in International Supersports (1995), European Sports Prototype Series (1997), and class wins in the World Sports Car Masters Series (2006). It was in 1997 at the Silverstone Coy's Classic meeting that I got Clay Regazzoni out from his lunch in the BRDC suite (!), together with Martin (Ridehalgh), for a reunion photo with a 312P Ferrari. Clay was a real gentleman about it and clearly remembered the original meeting!

"The car was originally built with the 2-litre 906/910 racing engine with Weber carburettors, titanium con-rods and bolts and twin-plug ignition. I installed the 2.7-litre RS engine on fuel-injection. It was modified with twin plug heads (but I only ran single ignition!). The long-term plan is to build up a more correct 906 2-litre engine." (Author's note: this 906 engine build is under way at the time of writing.)

Oops! “The fine drive of the 3-litre Ferrari ended when it tangled with the Dulon, the exact same fate that befell the two cars at Brands Hatch,” says the report of the race. Spa 1000km 1971. (KM)

The Dulon Porsche in the 1990s. (JS)

Reunion: Martin Ridehalgh met up with Clay Regazzoni at a Silverstone Classic meeting, where they swapped stories, joking about the fact that no-one there probably remembered the Spa crash. (KM)

♦ ♦ ♦ ♦ ♦

GLD-Porsche

The GLD only just creeps into our study, but it's worth a mention at least for effort. Sadly the effort was insufficient to allow it to qualify for the 1975 Le Mans 24 Hours. The car was the creation of one Jean-Louis Gamma and was to have been driven by the entrant/owner and Franc Leclerq. The car consisted of a 1967 Porsche 910 chassis onto which Gamma had created a very passable body. However, it is said that lack of testing and the not inconsiderable age of the car rendered it 'hors de combat' before the serious work of qualification began. Gamma had competed in French National races with a 911 and a Jidé Renault in the early 1970s before acquiring the 910, thought to be chassis number 14. It ran in

testing at the 1974 test weekend on 23-24 March, driven by Gamma, recording a lap time best of 4min 33.1sec. At that time it was a targa-top conventional 910. It ran in the 1974 Le Mans as a 910, but ran out of fuel on the 143rd lap, therefore recording a dnf. The car was then modified to create an open sports car for 1975.

The ill-fated GLD, as seen in testing and practice during Le Mans week 1975. (AJFR)

♦ ♦ ♦ ♦ ♦

GSL-Porsche

The GSL is another solo effort that seems to have first appeared at the Nürburgring 1000km, on 9 May 1974. Little is known about this car except that it used a Porsche engine, and was entered and driven by the Swiss Bernd Seidler, who is a little better known than the car. Seidler raced on 23 occasions at international level and classified as finishing on 16 occasions.

The GSL was entered as the GSL BS910 (BS – Bernd Seidler).

The 910 is said to refer to the engine, which is from the 910 Porsche. The car appears to have been yellow with grey arrows. The bodywork may well be of a type created by KMW, who were providing many bodies in this era for owners to attach to the chassis of their choice. Seidler was active on the racing scene from 1966. In 1970-71 he campaigned a Lola T70 in the Interserie, and in 1972 a McLaren M8. In 1974 on 17 June at the 300km of the Nürburgring, we see entered and finishing 29th overall a Porsche 906 GSL, implying that the engine may well have been that fitted in the type 906 Porsches – a type 901 twin-plug engine. On 18 August at the Kassel-Calden Interserie round, the GSL and Seidler come home 12th overall. In the entry list, and finishing 7th overall in the Redlefsen Super Sprint on 8 September 1974, we see the GSL again, then 13th overall at Casale in Italy on 22 September. In 1975, the GSL BS910 shows up at Mainz-Finthen on 15 June in 11th overall. The author was unable to establish what happened after that.

With bodywork shape looking remarkably similar to the KMW at the beginning of this chapter – yellow with grey arrows – the GSL BS 910 had a fairly undistinguished career. (P)

♦ ♦ ♦ ♦ ♦

URD-Porsche

The first we see of the URD 774 is in 1975 at the Hockenheim round of the Interserie challenge on 20 July 1975. Driven by Erich Küstner, the car was disqualified. Why, we do not know.

Ernst Ungar was the man behind the URD operation, based in Grafenau near Stuttgart, and the URD marque can still be seen today. Erich Küstner raced a URD774 at the Karlsruhe Hockenheim ADAC race meeting on 6 July 1975, finishing 2nd in the Sports Racing Prototype class. Driven by Hubert Schmidt, the Ungar Racing Developments Porsche-powered Sports Prototype was out again on 29 August 1976, in the AvD Interserie round at Hockenheim, where Schmidt was 12th in both heat 1 and heat 2, classifying 22nd overall. At the Ulm round on 12 September he was to finish 10th overall. Not

a particularly successful car, its best result seems to have been on 28 November 1976 at the Hockenheim Season Finale: 1st in class LG2. For another URD we need to go forward to the 1980s, and the Kannacher Racing Team, where we see Kees Kroesemeijer in a URD C81 Porsche on 20 March 1983. An accident in practice meant he was a non-starter. Other URDs ran regularly into the 1980s with BMW engines.

Connected to the URD story is a car being called an EBS Porsche Spyder. In 2016 it was up for sale in France, claiming to have been built in 1972 as a prototype at Porsche Weissach by a Porsche engineer, Eberhard Braun. This is incorrect: Jürgen Barth told the author: “Eberhard Braun was an engineer in Weissach, but this car is a URD, and never had anything to do with Weissach, Porsche or Eberhard Braun.” (This point is also confirmed in an article about the car in Excellence magazine, dated December 1993, where it is stated that Braun denies any knowledge of the car.)

In 1978, in a race listed as the Stuttgart Prize at the International ADAC/MCS Hockenheim on 25 February 1978, there appears a car called an EBS. The driver is listed as Ernst Eberhard and he is shown as finishing 2nd in the S1.6 class, but it is not confirmed if this car had a Porsche engine. (Author’s note: during my research, an owner of the car contacted me. He says in his e-mail: “It’s exact to say this chassis is a URD, built by URD with at first an original 2-litre Porsche engine. I don’t know why people call this car an EBS Spyder! This car has nothing to do with Porsche or Weissach.” It seems it had in the early 1980s found its way to the USA to a Mr Nevin, and at some time into the hands of one Dick Hyland, who raced it or tested it on several occasions, then to Australia and recently to France where the present private owner has it.

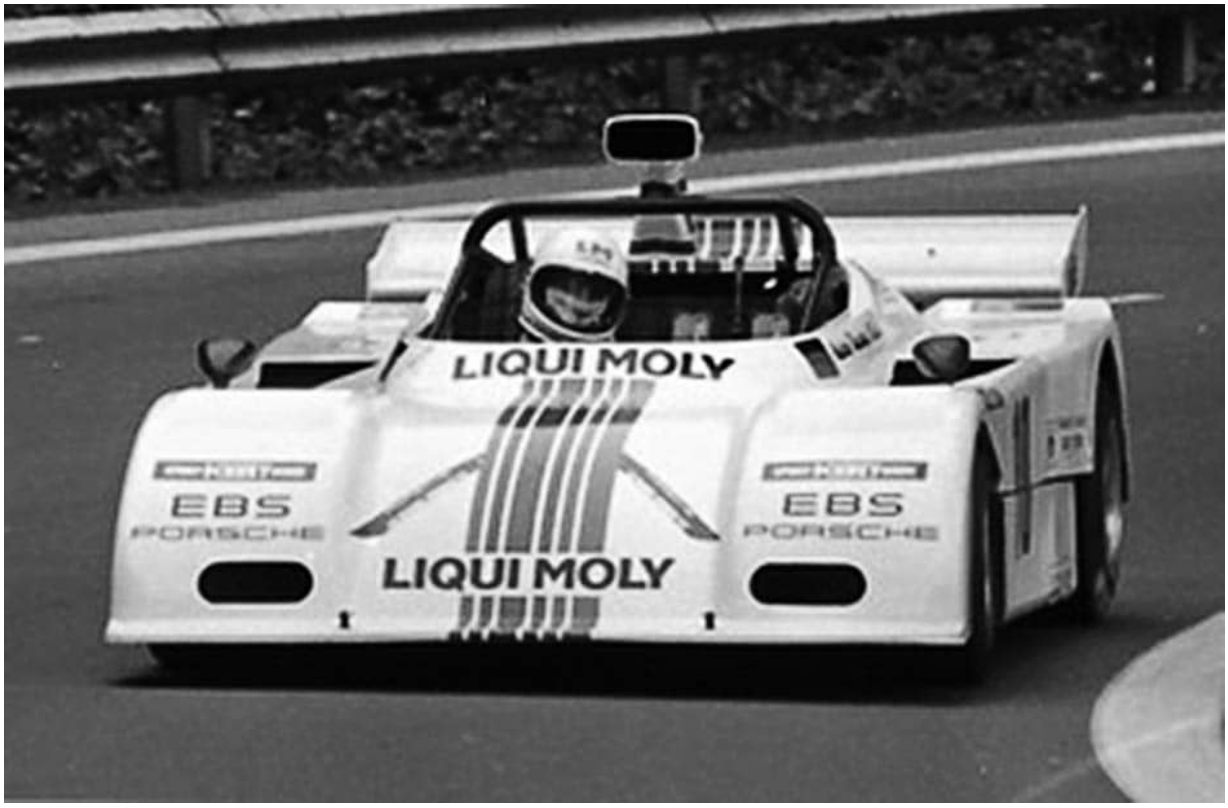
The URD676 driven by Hubert Schmidt: the Ungar Racing Developments Porsche-powered Sports Prototype, seen here in 1976 on 4 April at the Nürburgring 300km. It failed to qualify for the race. (Kooy)

URD C83 at the Spa 1000km, 4 September 1983: Walter Lechner/Jürgen Kannacher/Wolfgang Boller qualified 19th, but failed to finish when the gearbox seized on the opening lap. (Kooy)

♦ ♦ ♦ ♦ ♦

A fascinating car: this URD was last heard of in France, the car having first gone to the USA in 1979, then to Australia, and eventually to France. (RS)

The mysterious URD, called an EBS, seen here at the Stuttgart Retro-Classics 2015, came up for sale in France in 2016. (RS)



The mystery URD in action. Sorry, but we have no idea where or who is driving, in spite of much searching. As a URD it is a non-Porsche-built car, powered by Porsche, apparently by an ex-911 RSR unit of 2.8 litres. (RS)

So far we have seen the early development and many new ideas of the privately built alternative to Porsche Sports Prototype race cars, as well as the GT cars from the likes of Kremer in Europe. In the USA things were taking a slightly different turn. Whilst many European race cars would find their way to the USA, there were some pretty fancy developments going on. The Indianapolis 500 had been the great historic event that influenced hundreds of 'special' builders, before and after the war. Big saloons racing on dirt tracks led to more sophistication and drivers looked towards progressing to ovals or, in the case of saloon drivers, a move up to sports cars. We have seen in the chapters on the 1950s and 1960s that the USA was a positive breeding ground. A Porsche engine was even seen in a Midget racer, more of which can be seen in Chapter 8.

By the 1970s, Porsche had a new car to promote and, as in Europe, GTs were to become big news. One name in the USA that was to provide serious competition right through to today is Brumos Porsche. Peter Gregg had taken over the Brumos Porsche business in August 1965, acquiring the company from the estate of the late Herbert Brundage. By the 1970s, Peter Gregg and the Brumos company were the ones to beat when it came to racing Porsches. Hurley Haywood had come along in 1969 as a young driver to join Peter Gregg, and they won their class in the Watkins Glen Six Hours in a 2.2-litre 911S. Then after a spell in Vietnam serving his country, Haywood returned in 1971 to become joint champion with Gregg in the new IMSA GTU class with their Porsche 914/6. A young Al Holbert was on the rise then, too, racing with his father Bob Holbert's cars, where he had a close connection to Roger Penske (Al Holbert would start his career in a Penske car).

(L-R) Richie Ginther, Jo Hoppen, Elliott Forbes-Robinson – key players at the introduction, and for the next two years of the 914's fortunes in the USA. (P)

Porsche had brought this new car, the 914/6, to the racing scene in 1970. Through the early part of the 1970s in Europe, these remained pretty much standard 914/6 GT-style models. However, Porsche decided to promote the 914 in the USA; sales had been slow, so Volkswagen-Porsche, as it was known then, and its USA competition manager Josef Hoppen, were charged with racing the cars to raise the profile. It was decided the best place to race and get the public on board was in the SCCA regional events all over the USA. Hoppen set up facilities for three different two-car 914/6 Porsche teams to compete in the SCCA-governed races in three geographical regions of the USA. Each VW-Porsche assisted team would get $50,000, and cars to run for the season in the 'C' Production class. In the east, it was to be the team run by Peter Gregg of Brumos, while the midwest

effort would be headed by Art Bunker, Bob Hindson and Kendall Noah. In the west, Hoppen initially spoke to Volkswagen-Pacific, suggesting Richie Ginther could manage their team, as he was already competition manager for the VW-Pacific concern. Alan Johnson, the test driver of the first car, told the author: “Jo Hoppen sent the car to the VW-Pacific Porsche dealership of John Von Neumann. I drove that first car at Willow Springs for a test – that was when Richie Ginther got involved.”

Ginther and his chief mechanic, Harold Broughton, on receiving the 914s in the USA, saw that the cars needed modifying to make them faster. The first job deemed necessary was to completely strip and rebuild them, incorporating, removing or changing everything permissible to get an end-product as light and as fast as the team could make it.

The cars would arrive in the USA as standard 914/6s. Those chosen for racing would then go to Richie Ginther’s establishment on the west coast, where the engines were stripped and rebuilt, using new parts from other Porsches such as the 911T, with crankshafts in the standard engine immediately changed for 911S items. Each of the cylinder heads received valve modifications, plus polishing and porting treatment. Carrera 6 camshafts and specially tuned exhaust systems were also fitted, as were other items permissible within the regulations. The windscreens on the early cars were removed, as was the window behind the driver, to leave what would be a low, sleek-looking racing car.

Ralph Meaney, one of the early customers to get a 914/6, tussles with the Lotus Europa at Watkins Glen in 1970. As can be seen here, the cars were pretty normal-looking 914/6s. (P)

These radical modifications were an example of what was to come. Porsche was watching, horrified that the cars that went to the USA were immediately dismantled and recreated. But Porsche took notice, and, interestingly, itself started acquiring parts from the USA. During a search in the archives in Stuttgart from around this period of the early 1970s, the author found a copy of an invoice for parts. Volkswagen Pacific is in this case the supplier of numerous special parts to Rico Steinemann – US racing parts for the German cars, likely to be the same as the items fitted to the Ginther racers. The invoice includes: Teflon bushes, 21 and 22mm torsion bars, Teflon front stabilisers and rod-end bearing modifications – all items that were definitely non-standard on 28 April 1970, the date on the invoice.

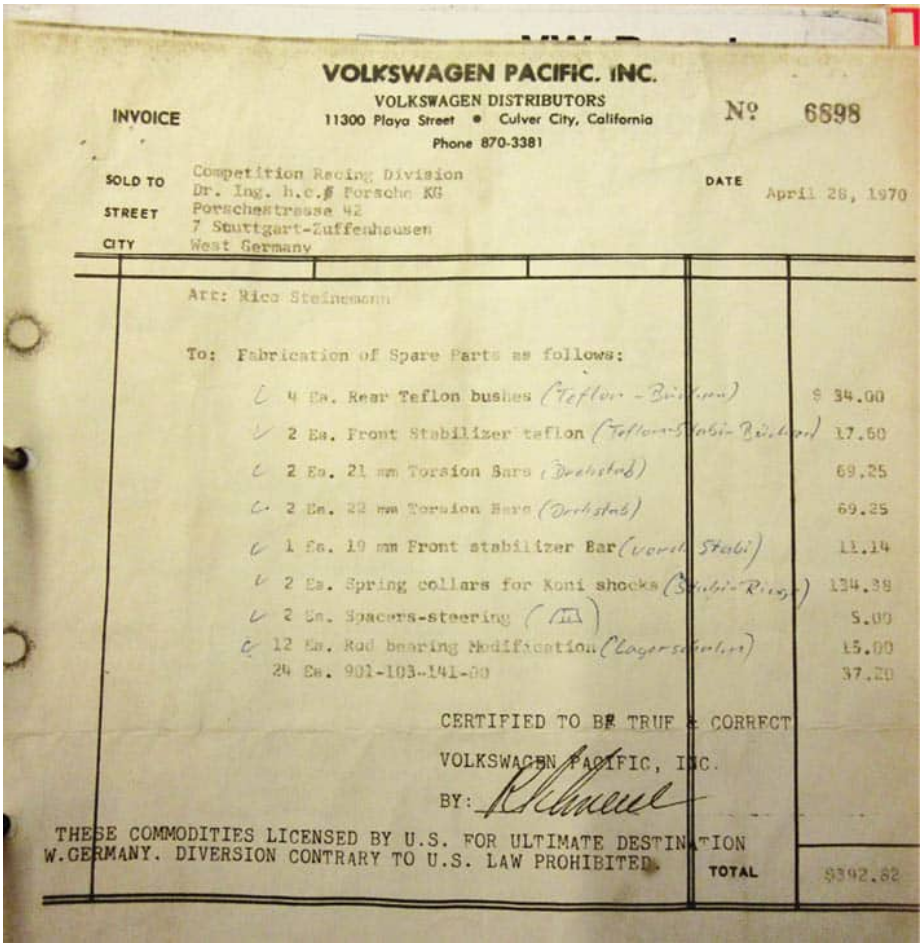
The stripped-out 914s were very fast; so fast that when the SCCA got wind of the new special factory 914/6GTs, it decided even before they hit the USA to ban them in the Production C class. This dispute at the end of 1970 over the Porsches' performance saw a switch in championship appearances to the new, aforementioned IMSA GTU

(under 2.5-litre) class. At the 1971 Daytona 24 Hours, the GTU (under 2.5-litre GT cars) class winners were Jacques Duval/George Nicholas/Bob Bailey in a 914/6 GT (No 5), said to be factory chassis 043 1017, finishing 7th overall.

Alan Johnson in the Richie Ginther-prepared 914/6 – radically modified to run in the SCCA regional races. This image shows one of the early appearances of the 914 on the west coast at the Riverside National meeting in May 1970, where Johnson was to win the 'C' production category. (AJ)

Alan Johnson in 1970: the 914 would be significantly modified from the standard to race in the SCCA series. (AJ)

The legendary Bob Holbert, and son Al Holbert, destined to be one of the great drivers to come out of the USA, outside the Holbert Porsche dealership in the early 1970s, with a Ginther/Peter Gregg-developed 914 C production. (P)



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4 Ea.	Rear Teflon bushes (Teflon - Buchsen)	$ 34.00
2 Ea.	Front Stabilizer teflon (Teflon-Stabi-Buchsen)	17.50
2 Ea.	21 mm Torsion Bars (Drehstab)	69.25
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The evidence of Porsche buying 'tuning' components from America in the 1970s. (P)

Class winners Jacques Duval/George Nicholas/Bob Bailey: 7th overall first time out for the remarkable 914/6 GT, beating 43 more powerful cars. (©P)

The Walt Maas 914/6. Now a silhouette muscle car, it would see action in 1971, ’72, ’76, ’77, ’78, ’79, ’83, ’84, and ’85 with various owners. It had been one of the early 914/6s supplied to Art Bunker by VW-Porsche’s Jo Hoppen, who had organised for Richie Ginther to develop the cars for C production racing. (MK)

A new IMSA GTO and GTU Championship series was introduced in 1971. (The full story of the 914 race cars can be studied in this author’s work Porsche – the racing 914s, published by Veloce.) The early cars and most that ran in the early part of the 1970s were Porsche-created cars. Over the years that followed, competitor marques got faster, which would see the beginning of the demise of the 914 in GTU. This is when the versions of the 914 not created by Porsche started to appear. The cars had begun to get wilder and wilder-looking due to the modifications being done by their American owners. This was to feed a new championship for Trans-Am cars. In general most of the 914s do not fit our criterion of other manufacturers’ cars using Porsche engines, but one or two do, and

one that certainly does was the Walt Maas GTU IMSA car. It was pretty much one last throw of the dice for the Porsche 914 when Walt Maas won the GTU IMSA Championship in 1977. It looked vaguely like a 914, but was certainly an alternative race car, in fact a total reconstruction of an early model given some Walt Maas steroids. The car started life as a 914/6 GT post-factory kitted chassis 043 0332, a car that first went to Art Bunker back in 1970, as one of the Ginther USA-modified cars. It was sold on to Daniel Muñiz in 1972. Maas was nearing the end of an interesting racing career and found himself without a ride in 1976. He acquired a basket case! It is reported that the 914 was completely reconstructed into what we see here by members of the Porsche Club America and Walt's team crew, Jerry Woods and John Clever. Walt Maas, in an interview ten years later, said: "I thought at the time that the 914/6 could be competitive with the Datsuns that were dominating the GTU class. We created a state-of-the-art race car, and we won first time out!"

Garretson Enterprises was the base for the work. Two engines were built: one a 2464cc short-stroke with Porsche 906 internals, and the other a 2494cc long-stroke with RSR internals. Carburation was by 46 IDA Webers. Carlsen Porsche+Audi came on board with sponsorship, and the all-amateur team was ready for action. Walt Maas said in a newspaper interview: "I began to realise we had the possibility of winning the Championship. But we didn't have the financial means – that was our next goal." Maas finished the 1976 season with four victories and two 2nds, giving him 2nd in the IMSA GTU Championship to Brad Frisselle in a factory-supported Datsun 240Z! The 1977 season would see a now-ancient design, albeit a highly modified one, win its second championship in GTU, the last 914 championship win being Gregg/Haywood in 1971. Walt Maas also says in the aforementioned newspaper interview: "We had more horsepower, which was important." The GT class (GTO-GTU) was still a popular series, and it is recorded that nearly half a million fans would see the 16 races that made up the season. Interestingly, it would be the last season in this era when a normally-aspirated car would win the championship.

Maas clinched the 1977 IMSA GTU Championship ahead of Sam

Posey (Datsun 240Z). Over the two years of racing, he racked up twelve wins, three 2nds, one 3rd and one 4th; the Maas-driven car was probably the most successful 914/6 (replica) in the history of the model in that period. Walt Maas is recorded as saying: “After 16 years of racing, that’s my last race. Winning a national championship with the pros with an under-financed operation against a factory team is very satisfying.” This was another classic case of a good driver, a well-organised team, with limited funds, yet with a vision of what could be done with a well-built (almost home-built) car with Porsche power providing the business end. The period of the highly modified 914s was short; this is just one of several, and they can still be seen racing in vintage events today.

♦ ♦ ♦ ♦ ♦

Mid-America in Wentzville, Missouri, 15 May: Walt Maas wins the GTU class in the 100-mile race, finishing 8th overall. The (some might say) antiquated 914 had never been placed lower than 4th since the start in 1976, frequently beating much faster machinery, but it would be a tough fight in 1977 with Sam Posey’s Datsun 240Z. (MK BO)

As we have seen with the 914s, the thinking in the USA was different to that in Europe, where having bought a factory-built car, the driver/team kept pretty much to the original specification. In the USA, the teams routinely took their cars apart and rebuilt them, often with many modifications, to the extent that they were hardly factory cars any more. The new Rs and RSRs would undergo the same treatment. Jürgen Barth told the author that in the USA during the 1970s many of the older 2.5-litre and even 2-litre cars, too, were being upgraded and developed, to an outrageous degree in some cases, in an effort to copy the new Porsches, the RSRs and later 935s that were being delivered from the factory. Guillermo Rojas, who had been asked by Hector Rebacque's father to help get the young future F1 driver Hector Rebacque into racing with the 914 Porsches in 1972, had acquired sponsorship from Viceroy cigarettes, and also an ex-works Martini RSR to which was fitted a long tail – one of the early customer self-upgrades. The author was told that 'mostly' only new RSRs were supplied to the USA customers. However, the American racers always liked to do things their way, and, as several team owners told the author, Peter Gregg of Brumos always completely dismantled his cars and rebuilt them before racing, often carrying out his own modifications. One team boss from the period said: "All the teams modified their cars to a certain extent, often immediately on arrival of the car in the US."

Michael Keyser says: "When we first got our RSR it had the factory bumper, but then we switched to the flat type in 1974 and for all of 1975." At the time, this was not the norm in Europe, although one can see the number 73 RSR of Milt Minter/Michael Keyser/Paul Blancpain at Le Mans in 1974 sporting this type of front bumper.

Getting wider: this is the Toad Hall Racing RSR of Michael Keyser. "Modifications from the standard were de rigueur," says Michael. (MK)

With the plethora of 911s of various denominations that were now seen racing, many complete reconstructions were appearing, with so many changes that hardly any were left as pure factory cars. Sometimes it worked; sometimes it didn't. It is often difficult to identify the updated cars and there were so many that they would fill a book on 911s alone. Often various parts, gearboxes, suspensions, etc, would be switched from car to car. This was the era of 'several parts fits any car,' and in America, unlike in Europe where the teams tended to trust the design and build of the Porsche factory, the race teams wanted to 'do it my way' and tried everything. Even some cars that started out as 2.7 RSs finished up as twin-turbo full house 935s. We will come to those in a moment.

1975 saw changes in planning for the Sports Car World Championship regulations, due to come in in 1976. GT and touring cars were enjoying great popularity, whilst the Sports Prototypes were expensive to make and run, and their popularity was going

through a fade cycle.

Peter Gregg at Brumos was frequently ahead of the game. Brumos would create several cars in-house, but when he turned up on 9 August 1975 to race the long-tail car, and everyone saw he was significantly faster than all the other Porsches, IMSA banned the long tail! Group 5 was the title given to the special production cars that made up what was, in effect, a silhouette formula during the 1970s. Cars needed only to look like those in the standard production classes, though the basis of the cars had to be from the production car.

73 RSR of Milt Minter/Michael Keyser/Paul Blancpain at Le Mans in 1974 sporting the deep front bumper to aid aerodynamics. (MK)

Flat front and now huge rear wheelarches allow for modifications to the original race-winning 1973 Brumos RSR, seen here in 1975. (MK)

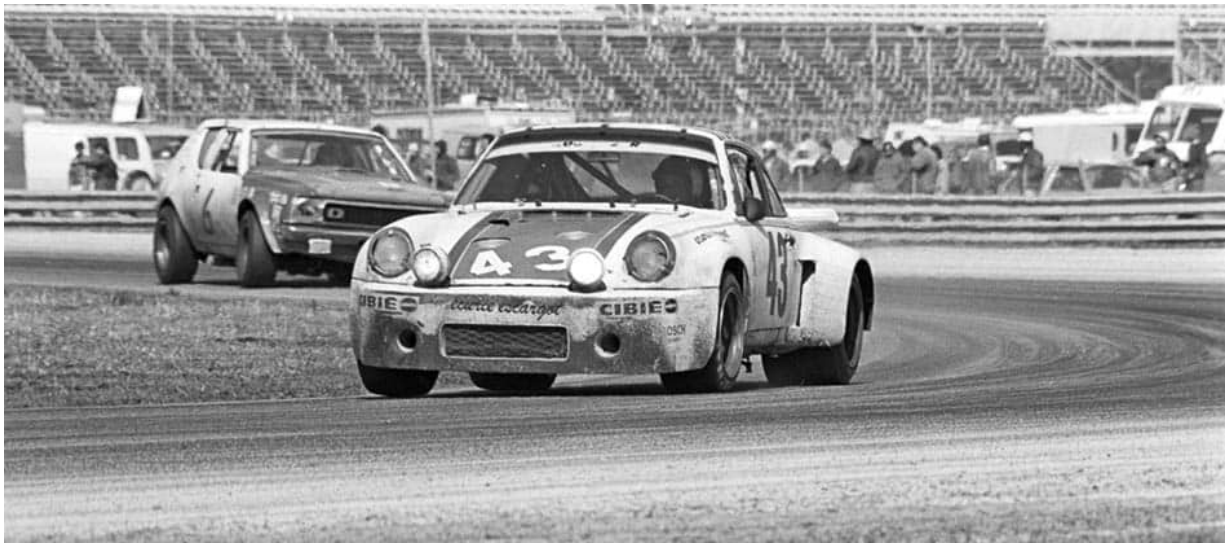
While Porsche was carrying out developments at Weissach that would lead to the new 935 model, Peter Gregg at Brumos experimented with a long tail for his 934 when it raced at Talladega, 9 August 1975. It was banned shortly after. (BO)

1974 Watkins Glen: the Brumos car makes a pit stop – the 911 RSR with slightly less wide rear arches. A demonstration of the many changes that were being made when compared to the car as it was to be in 1975. (P)

The reader may think we are wandering away from the subject of this work, which is about the non-factory-chassis cars, but in the case of the USA, as stated, in the 1970s the blurring of the subject and the American style of dismantling and rebuilding any new race cars means that these cars are worthy of mention, because the modifications, good or bad, would be the birthplace of the next step: home-grown in the USA, tube-(space-)frame cars. Porsche created a 911 derivative which became the 934 in 1975. With its 480 to over 500bhp engine, limited almost only by the boost pressure and its 7000+rpm, the race teams came rushing to buy it. For Porsche it was not a huge step to go to the 930 and 934 Turbo cars from the RSRs, and on to the 935. But with the coming of the new rules in the FIA championships and the arrival of the GTO and GTU classes in IMSA some years earlier, the new 935s would become the wild children of

the grid. Kremer and Joest did it in Europe; now in the USA it would all go a stage further. Whilst the 930 and 934 Turbo Carreras were pretty much similar in type, one might say loosely like road cars, the new 935 for the recent Group 5 regulations was a whole new ball game. Kremer and also Joest would bring their cars to the US. This was made easier because, although Porsche built a few so-called 934½ factory cars, it also made available a full kit of parts for teams to convert the previous 934 to full 935 spec – just what the teams in the USA were looking for.

In Europe, the immediate domination of the new 935 drew the attention of the scrutineering officials, and the CSI (Commission Sportive International) demanded changes to the bodywork; this required mechanical changes and adjustments in cooling arrangements, so although it was capable of winning out of the box, enforced changes necessitated new development. By the time the 935 arrived for the Watkins Glen 6 Hours on 10 July 1976, Porsche was ready with two cars. Both qualified on the front row of the grid, with a car modified from 934 to 935, entered by Egon Evertz, in 3rd position on the grid. However, it was the works car of Rolf Stommelen/Manfred Schürti that came out on top, after a race-long tussle between the cars that resulted in a 1-2-3, some three laps ahead of the previously dominant BMW of Peter Gregg/Hurley Haywood. The American Porsche teams sat up. They had to go 935 to be winners now. But not so fast! At the 1977 Daytona 24 Hours, the amateur team of Dave Helmick took the victory with the boss himself, and driving along with Hurley Haywood and John Graves in their 911 Carrera RSR. It would be the last time a normally-aspirated car won at Daytona in the period. However, in 2nd and 3rd came two 935s, both having problems that required time in the pits, where the slower and aptly named Ecurie Escargot caught and passed the favourites.



1977: the last normally-aspirated car to win at the Daytona 24 Hours at that time. Dave Helmick/Hurley Haywood/John Graves in Helmick's self-prepared 911 Carrera RSR. (P)

Performing qualifying lap times in the final period, John Graves managed to hold off the faster, and coming like a train after pit stops, 935s. The Watkins Glen 6 Hours in July of 1977 was won by a factory-entered 935, with the 2nd-placed car an all-USA team, George Follmer/Brett Lunger entered by Vasek Polak. By 1978, twin turbos would come along for the 935s in the USA, having been seen on the factory cars the year before. Also, for the World Sports Car Championships, Group 6 had gone, and Group 5, the period of the 935 Silhouette, would dominate.

The huge wing extension, its mounting point exceeding the regulations relating to body size, Peter Gregg's idea to get the wing back as far as he could. IMSA and his rivals objected! (JB)

1977 had seen a new company formed that would play a major part in the longevity of the 935 Type in the USA in the years to come: Dave Klym had set up Fabcar, initially to design and manufacture parts for race cars. Soon it would be the whole car, not only for the silhouette formulas that came later in the 1980s, but he would also build chassis for Porsche itself. We will pick this up in a while; for now, the Group 5 era would run until the end of 1981.

For IMSA, John Bishop had introduced a new class in 1976 that allowed tube-framed chassis; it was to be called All American Grand Touring (AAGT). Porsche itself looked at the formula but chose not to follow a request for a car to meet the IMSA spec from their motorsport manager in the USA, Jo Hoppen. IMSA had been concerned about the amount of modifications going on, and only finally relented to allow the 934s and 934/5s into their races late in

1977. It was allowable to use parts of the new 935 in its engine type 930/73; 600bhp was available. With the coming of the Group 5 class came the Type 935. Of course, Peter Gregg got hold of a new model 930-934/5, chassis 7700952. He set about making modifications, and used the car in practice at Road Atlanta, but protests flew over the rear wing arrangements, and it was not allowed to race: the wing hung out too far at the back of the car. What did he do? Extend the body!

However the objections to development riled Peter Gregg, and, having started in the IMSA series, he switched to finish 1977 in the SCCA's Trans-Am series, where the 934/5 could run without penalty. The Brumos car was about to get more powerful, too, as Peter Gregg had sent his crew chief to Weissach to see how the 935 engines were built. He came back with a lot of new ideas. There is a quote in John Starkey's excellent History of IMSA where Jack Atkinson, Gregg's crew chief, says: "We were supposed to tell the factory of any new tweaks we discovered, but we didn't do that until Peter had won three races!" In 1978, IMSA allowed the 935s to race in a new class, GTX, designed for experimental cars. This would morph into GTP in 1981. As we will see, tube-frame cars powered by Porsche would soon be 'the' cars to beat.

Another personality entered the frame in 1977, who would build interesting Porsche-powered cars in the future: Kevin Jeannette, out of Southern California. He started by looking after several teams' cars, including a 934 for the Whittington brothers, who had arrived with lots of cash and a pair of 935s. For IMSA, in 1978, read 'GTX experimental' – in other words, Group 5, as in Europe. Hurley Haywood, who assisted the author in two previous works on Porsches (Porsche: the 924 Carrera and Porsche: the racing 914s, both published by Veloce) is quoted as saying: "The first 935 I drove was at Daytona in 1978. I loved it. 700 horsepower, tons of downforce, big wing, a real rocket ship. 935s needed a certain technique to get them through the corners; everyone had his own technique of massaging the throttle to keep the turbocharger spooled up."

The extended bodywork of the 934/5 7700952. Originally direct from the factory, this is an example of the ingenuity of one of the top US teams: the car is now perfectly legal. Watkins Glen 1977: 6th overall. (P)

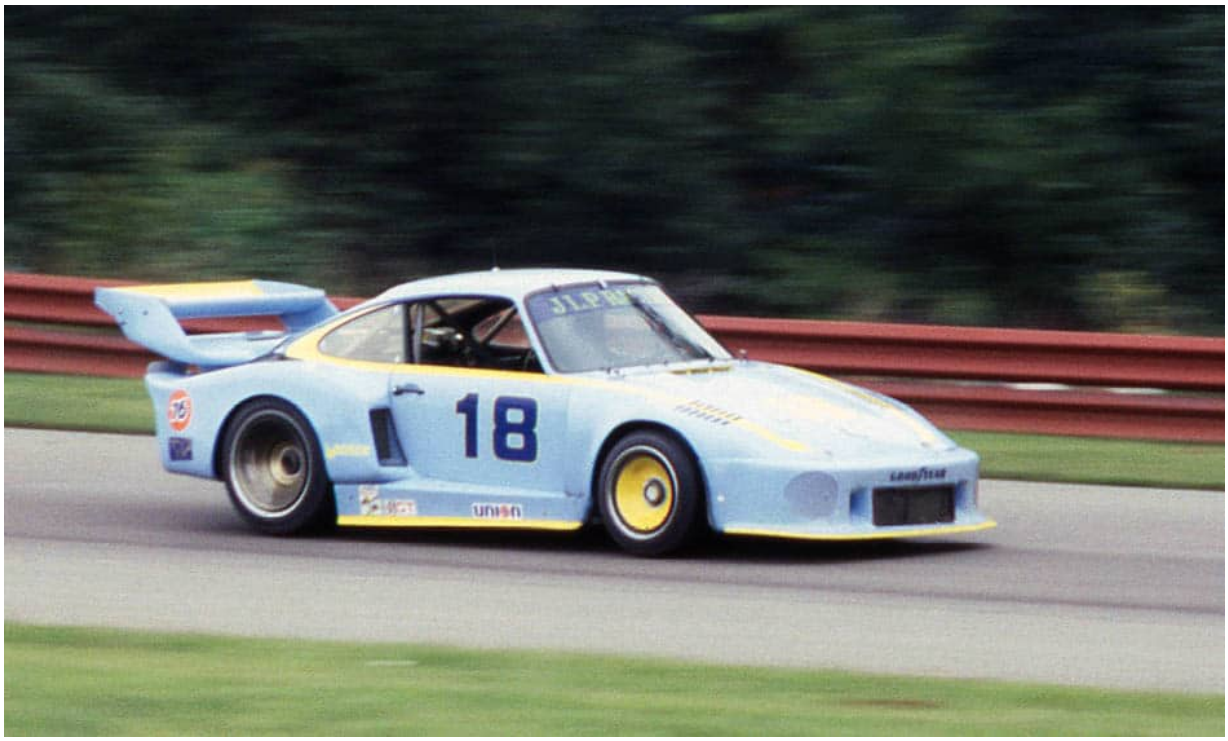
The Whittington brothers' Road Atlanta Jim Busby Special 935, just ahead of the Brumos 935; September 1978. (P)

Most of the 1970s had seen Porsche-supplied factory cars

delivered to customers who did any modifications they wanted. But in 1978 we see a major return of cars powered by Porsche but built completely by others. GTX and Group 5 Silhouettes were to be the breeding ground. Jim Busby was one who at the time built cars; he is quoted as saying: “I will build cars for anyone who pays the bills.” Newcomers the Whittington brothers went to Jim for a car. He got hold of an old 934, and, after some work, provided a 935 for GTX.

New bodies started to be appear, too. One Dan McLaughlin, of American International Racing (AIR), was making Porsche body parts. He had started with the RSRs, but, with the coming of the 935s, a full bodykit was soon available that was said to be more aerodynamic than the Weissach cars. In back-to-back tests it was found that his RSR bodykit allowed an extra 900rpm to be attained over the standard body. McLaughlin’s 935 kits would be in demand.

Then the world of racing was rocked once more when Porsche brought out the aforementioned ‘Moby Dick’ 935/78; it was to be the last of the factory race cars of this type, and would inspire a generation of lightweight tube-frame cars powered by Porsche coming from the works of those not owned by Porsche. Gianpiero Moretti would be going the Joest-built 935 route, Preston Henn, John Fitzpatrick, Charles Mendez, Ted Field and the Whittington brothers (after their first car by Jim Busby) would turn to Kremer-created cars. We will hear of these movers and shakers again soon, and in the case of Ted Field, also Indy cars.



JLP1 on track at Mid-Ohio 1978: John Paul Snr/Hurley Haywood – front row of the grid, but a dnf. (MW)

The Kremer version of the 935, now the 1979 Le Mans-winning Whittington Brothers car (seen here at Le Mans), would go to the Watkins Glen 6 Hours to another victory in 1979. (P)

As we saw in the Kremer Part 1 section, 1979 saw Don and Bill Whittington go to Kremer for their next 935 to take to the Le Mans 24 Hours; remarkably, they won. By 1979, the Kremers had the K3 well sorted, and started to supply wider-bodied examples for their customers. Added to this, they were creating and selling kits of parts, and rebuilding 935s for other regular 935 teams. Porsche, too, supplied a final batch of 935s to the USA for the IMSA series. At Sebring for the 12 Hours, no less than twelve 935s would start. Interestingly, finishing down the field was a totally new car by the aforementioned Dave Klym: the first Fabcar special. John Paul Racing had come on the scene with a 935 at the end of 1978; ostensibly a Porsche car, chassis 930 890 0037, it was called the JLP1. John Paul Snr would have some modifications done, but as we will see in a moment, the JLP1 was just the start.

Home-brew specials were by now a thing of the past. As we have

seen earlier in this chapter, a number of Sports Prototypes had appeared. With the coming of the GTs and Group 5, the factory-built cars – first the 911 RSR, then the 930/4/5s – would become very popular. There were few 'alternatives,' if any, in Europe, and it was, as we have seen, in the USA where the teams were playing with modifications to the acquired factory originals that formed the 'alternative' scene.

With that look at the 1970s, we will now move on to the 1980s and a world of tube-frames and monocoques. The 1980s would see a golden period for the 'Powered by Porsche' sports cars, and some interesting creations among the GTs.

Chapter 5

Power and performance – the 1980s

As we reach the 1980s, we enter a new world of super sports cars that would dominate thinking and, indeed, racing sports cars in general. These machines would influence a decade and more, both in Europe and the USA. First, though, we continue the story of the 935 series. Several cars were being built and run privately, now that the Porsche works team was not running them. Numerous replicas, like the Kremer versions, would continue to be a force to be reckoned with, even though the FIA Gr 5 class was known to be terminating at the end of 1981. The class, having started as Special Production in the early days, had formed the backbone of the GT classes. In the Sports Car class, and in some cases the GT class, the changes in the regulations in Europe and the USA created a new era, and brought about a concentration by design engineers on what was still, even by the early 1980s, an improving technology: the monocoque chassis. Through the 1980s, the aluminium monocoque chassis would lead the field.

History tells us that, back in 1962 at Lotus in England, Colin Chapman – a genius in many ways – oversaw the construction of the Lotus Elan, which had a riveted box section centre chassis. Chapman realised that the stiffness of this design could possibly be used to create a stiffer chassis in his racing cars, as opposed to the tube-frame construction used up to that date. There were, though, attempts by others earlier than this, as we will learn in a moment, and aircraft had been constructed of riveted aluminium for some time. Scrutineers at the 1962 Dutch Grand Prix got a surprise when Chapman's team turned up to race with the Lotus 25, but they could not find anything on the car to object to. A new era for racing cars had begun. The Lotus 25 won five F1 races that first year, with a

further seven World Championship Grand Prix wins under its belt in 1963.

Top racing car designer Tony Southgate, who began his career in the period, told the author: “I do not know when and where all of the various chassis frame configurations of the monocoque type first appeared, or who designed them. However, I do know when I first noticed the various constructions, and I started to create my version. You can guarantee there is someone, somewhere, who invented or produced a design of a frame way back umpteen years ago, so nothing is new; Chapman’s monocoque was not altogether new territory. In the 1950s-60s, popular chassis frame designs were of the small diameter tube type, heavily triangulated. Cooper was different in that it relied on larger tube diameters and less triangulation. The Fry Climax was the first aluminium monocoque-framed race car I remember – I saw it race at Mallory Park in 1957.” (Author’s note: David Fry had built racing cars many years before, but in the mid 1950s had moved his company to Bristol in the UK, making components for the aircraft industry. It was here that he began to use his aircraft construction techniques to create a stressed-skin monocoque chassis. This was at a time when most racing cars still employed a tubular-frame chassis. It also pre-dates the aforementioned Lotus.)

Tony Southgate continues: “The first aluminium monocoque race car I drew was the Lola Mk6, the V8 Ford powered mid-engined Le Mans car of 1963. The Lotus 25 is the most famous monocoque F1 – a beauty. After that, all F1 cars were to follow the Lotus style. Lotus also made a glass-fibre monocoque F3 and F2 car, the Type 27, but it did not work so well. In America, the Chaparral CanAm/GT (Chaparral 2A) car was a glass-fibre monocoque car and very successful. I think the first aluminium honeycomb chassis frame was produced by Lotus.” (Author’s note: Southgate joined Lotus in 1975, where he worked alongside Peter Wright on the Lotus 77 and Lotus 78 until the middle of 1977.) “The Lotus Type 79 (honeycomb construction) in 1978 was very successful.” (Author’s note: it might be interesting to the reader to learn that in the mid-1960s Jim Hall – Chaparral – was also experimenting with glass-fibre and honeycomb

aluminium composite – we are talking 1964/65.) Tony Southgate: “Once established, the aluminium, then honeycomb sandwich aluminium, and then carbon, chassis would become the norm. Carbon chassis took a while longer to become standard due to their enormous cost. The teams I was involved with at the time could not afford them, so stuck to aluminium honeycomb. The McLaren was the first full carbon car, followed at the same time by a Lotus version which was much cheaper to produce. I produced an all-carbon structure Le Mans car when at TWR Jaguar in 1985. Lancia also produced a carbon car at the same time.”

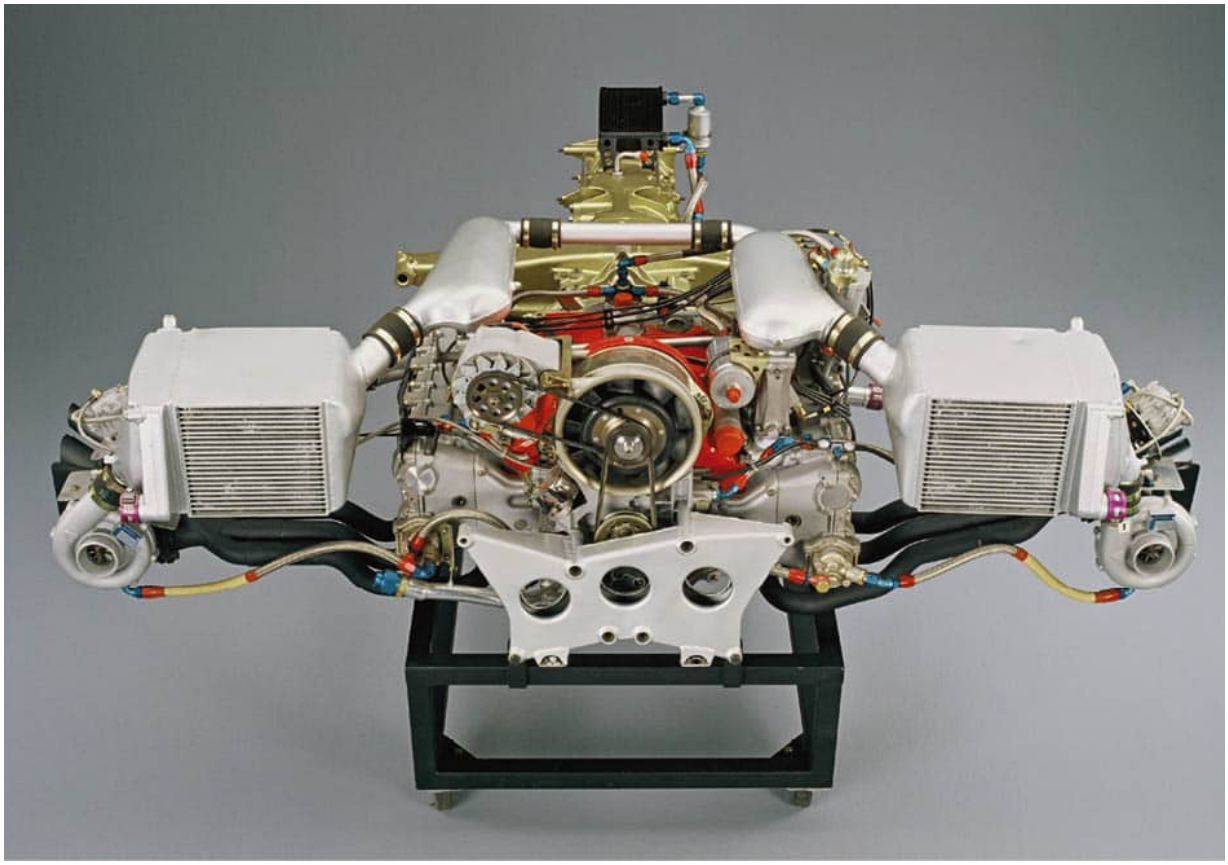
With this insight from Tony Southgate, we have the background for what is to follow, where we find the FIA rearranging the regulations. Like Gr 5, Gr 6 was changing: it would become Gr C. Grs A and N were for Production cars, Gr B for Super Production, Gr C for Prototypes, with GT for the regular Production GT classes and GTP for GT Prototypes. A new IMSA class was also introduced to allow US racers in a new formula to race in Europe: this would be IMSA GTP.

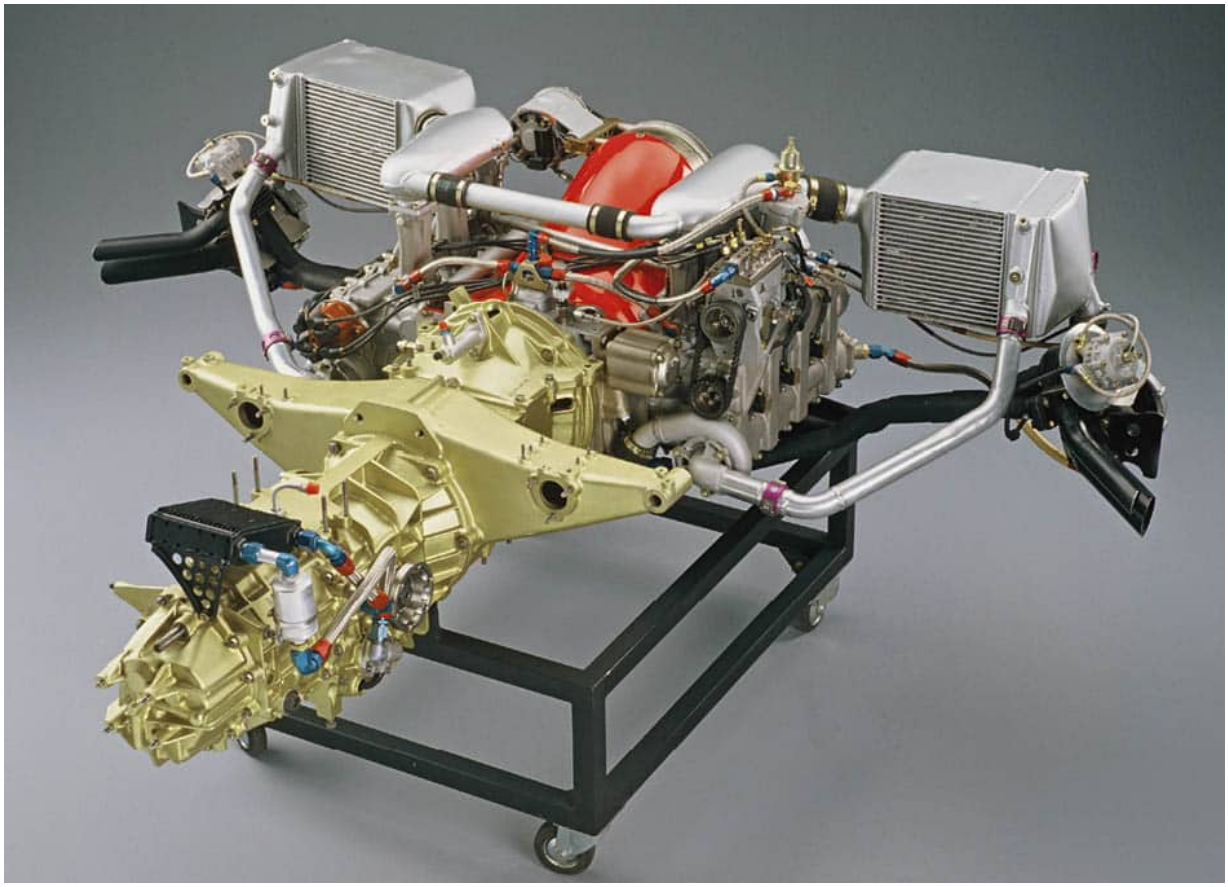
With regulations changing, the new format was to breed a new type of supercar. Due to come into force in 1982, Porsche created the Type 956 to comply with the new format, and then, late in 1983, the Type 962 – cars built to new regulations for Group C and IMSA Prototypes. The 956 however did not meet the new regulations that existed in the USA, due to the position of the driver relative to the centre line of the front axles. However, so good had the 956 idea proven to be, that it gave impetus to the design that would become the aforementioned 962, and was to be ‘the’ car to have if you wanted to win races through the late 1980s and into the 1990s. Also, with the coming of the 956, and then the 962s, we would see other chassis manufacturers emulate, copy, and indeed supply many ‘customer’ teams.

The motive power of the 1980s

As in our previous chapter, where we took a look at some of the engines, we will here take a view of the Hans Mezger-inspired 956 engine that became the base for the future engines of the 962s. This

is the way it looked in several of the cars of the period, and as it would be used in many of the ‘alternative chassis.’ Water-cooled engines, too, appeared, an innovation introduced on a few of the 935s from the late 1970s, previous engines having been air-cooled.





The layout of the twin-turbo 956 engine as it was in the 1980s. It provided the basis of nearly all the 962 power units that followed.

The engines that Porsche created in the 1980s are listed in the table below.

Year	Type	Cyls	cc	Cars	Power	Notes
1980	935/76	Flat-six	2142cc	936/80 Turbo	630bhp	Ran in the Martini-supported 936 to finish 2nd in the Le Mans 24 Hours
1981	935/76	Flat-six	2649cc	936/81 Turbo	630bhp	Wins the Le Mans 24 Hours 1981
1982	935/76	Flat-six	2649cc	956	620bhp	Wins the Le Mans 24 Hours 1982 Gr C
1983	935/76	Flat-six	2649cc	956	620bhp	
1983	TAGP01	V6	1499cc	McLaren MP4/1E F1	715bhp	First racing of the new Porsche TAG engine was at Zandvoort in August 1983
1984	962/70	Flat-six	2857cc	962	650/680bhp	Originally designated a 930/84; first ran Daytona 1984
1984	911	Flat-six	3164cc	953 (911 Carrera)	231bhp	Built for the East African Safari Rally
1984	935/76	Flat-six	2649cc	962C		Porsche factory car for the 1985 season; 4-cam 24-valve
1984	TAGP01	V6	1499cc	McLaren MP4/2 F1	820/870bhp	F1 Championship winner; for qualifying, higher boost was used to give 870bhp
1984	959/50	Flat-six	2849cc		450bhp	
1984	959/50	Flat-six	3164cc	959	232bhp	Designed for the Paris Dakar 1985/86
1985	TAGP01	V6	1499cc	McLaren MP4/2B	860/940bhp	Revved to 13,300rpm
1985	935/79	Flat-six	2649cc	956	640bhp	
1985	962/71	Flat-six	3164cc	March	720bhp	March Chassis
1985/6	962/71	Flat-six	3164cc	962	720bhp	962 IMSA
1986/8	935/82	Flat-six	2994cc	962C	720bhp	24-valve, 4-cam Final version, last 962 ran at Fuji in 1988
1986		Flat-six	2849cc	959	390bhp	Engine in winning 959 at the Paris-Dakar
1986	TAGP01	V6	1499cc	McLaren MP4C F1	910/990bhp	Engine in F1 Championship-winning McLaren, Alain Prost
1986		Inline 4	2479cc	Porsche 944 Turbo	220bhp	
1986	961/70	Flat-six	2849cc	961	640bhp	The racing version of the 959 rally car ran in the IMSA class
1987	TAGP01	V6	1499cc	McLaren MP4/3 F1	960/1060bhp	The max boost for qualifying was achieved at 12,500rpm
1987	961/70	Flat-six	2849cc	961	650bhp	Same engine and car as in 1986 with increased output; Rothmans-sponsored
1987		Flat-six	2869cc	962	680bhp	Winner of the Daytona 24 Hours

The 956 engine was a development of the 930/935/936 used in 1981; initially a Type 935 2.65-litre turbocharged flat-six, it produced around 635bhp. All the 956 car chassis tubs were built at Porsche excepting three, one of which was created by Fabcar in the USA (at the request of Porsche “for Dr Siegfried Brunn,” said Dave Klym). To the author’s initial knowledge, confirmed by Jürgen Barth, only one

956 was built away from the Porsche factory that took to the tracks. It would be built by Richard Lloyd Racing GTi team, utilising the skills of Nigel Stroud and Peter Stevens with input, so the author was informed, of Bob Sparshott, former F1 chassis man. The author, whilst researching this work, also learned of a second 956 chassis being made at GTi Engineering. It is also said that GTi Engineering was the first to use the aforementioned relatively new technique of aluminium honeycomb (an upper and lower sheet of aluminium with a sandwich of honeycomb aluminium, as used in the aircraft industry, in between the two sheets) for the monocoque in a sports prototype.

As already mentioned, the 956 was not accepted in the USA because of the driver's position, with his feet in front of the front wheel centreline: in the USA the feet of the driver had to be behind that centreline. Other US regulations surrounded fuel capacity and roll-over bars.

Thus was born the 962, when in 1983/4 Jürgen Barth and Norbert Singer put forward the idea of a 962 C for the World Sports Car Championship Gr C regulations, and a 962 GTP, a sports prototype, to comply with IMSA's GTP regulations. The author was also informed that Al Holbert played a role in that decision. It became a masterpiece that would kickstart the replica builders. Dirty word? – no, they were just non-Porsche chassis constructions that would race well into the 1990s. The specialist suppliers began to build their own versions of the 962 monocoque chassis. The author was informed that the different chassis tub builders used different spacing and pattern of the riveting, which serves as a fingerprint for those that follow the subject to tell who built what by the pattern.

When Group C was born in 1982, there would be many new teams who would enter the class; it was a class not just for the manufacturer teams, but also for the small-scale constructors. Let us just look at the regulations for a moment. Initially there was no limit on the engine capacity, however the dry weight of the car (without fuel or driver) should not be less than 800kg. IMSA in the USA embraced the class with its own limits, which we will see in a minute. The Gr C class was pretty free body-wise, though the ground-effect moveable skirts popular in F1 at the time were not allowed. Restrictions were

limited to dimensions of body, wings, cockpit size and door openings. Fuel loads would be different in Europe from those in the USA. Initially all races run under Gr C rules were of 1000km or 6 hours, excepting Le Mans in Europe. (Daytona and Sebring were 24 and 12 hours respectively.) Gr C2 was introduced in 1983 to bring in a Junior category, which consisted of slightly smaller cars and a lighter weight, but generally apart from weight, size and fuel loads, most of the Gr C senior class rules applied. In 1984, the minimum weight was increased to 850kg, and 1985 saw fuel-load restrictions in both C1 and C2, as well as a specific drivers' championship for the C2 class separate from C1. In 1986, some races that were of the original scheme (1000km, etc) were to become shorter 'sprint races,' and in the IMSA class turbocharger adjustment in the cockpit by the driver was banned. In 1987 the use of super fuels as used in F1, such as toluene, etc, was also banned. In 1988 there were changes to undertray specifications, ride heights, and an increased fuel allowance in C2. The points awarded per race were also tinkered with. We will stop there with these basics; we have purposely not gone into great detail on each item because that is not the purpose of this work. It is the cars that are the stars, and who made them and chose to run with Porsche power. We will start this decade of the 1980s with the second part of the Kremer story.

♦ ♦ ♦ ♦ ♦

Kremer-Porsche – Part 2

We begin with a car that was not only dated, but was to be a trip of nostalgia; an idea to create a car to run at Le Mans, before the rule changes came into force in 1982.

The Kremer 917 was initially meant to be a bit of fun for the Kremer brothers, so the author was told. The plan was to build a 917 for their own enjoyment – a track-day car, if you like. The design, of course, went back into the 1960s, and by 1980 was regarded as being pretty much out of date.

The Kremers, of course, had access to Porsche, and Porsche was amused by the brothers' ideas, so helped with components, drawings

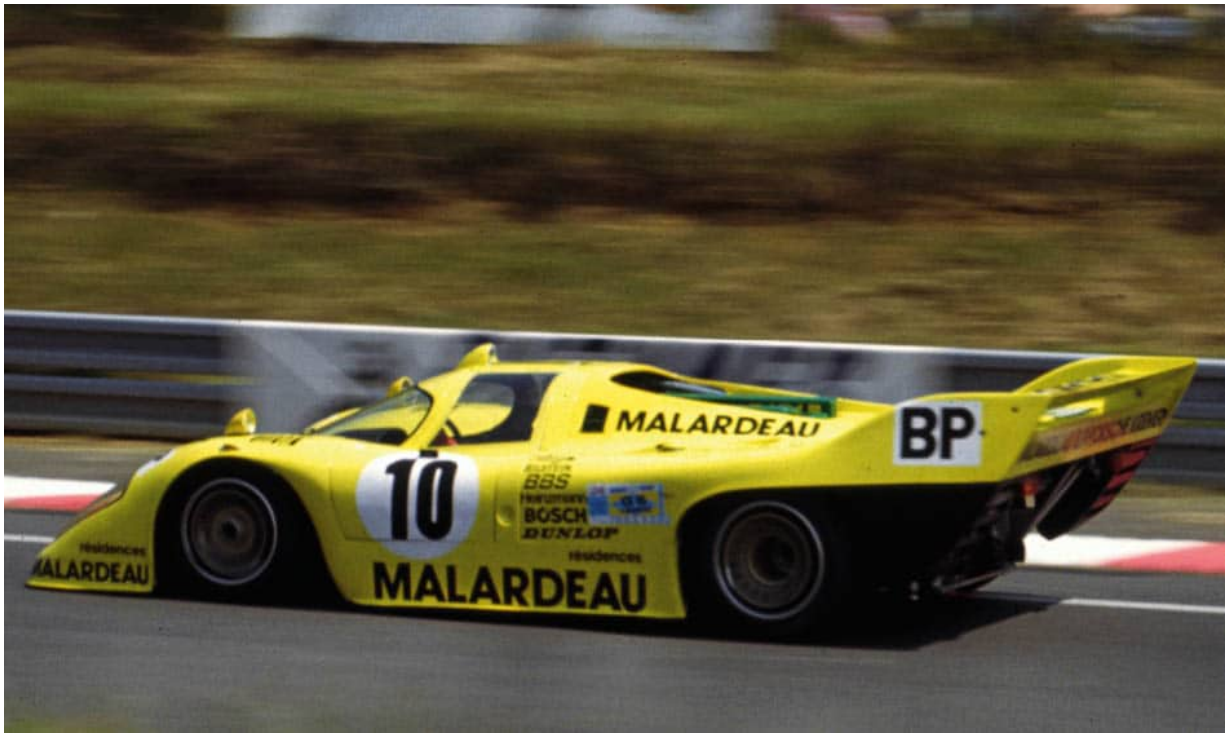
and engines. Kremer Racing built the tube-frame car in its own works.

Kremer had won the 1979 Le Mans 24 Hours with the K3 Type 935, a victory which would boost sales further, ensuring the life extension of the 935, and see Kremer develop the 935 K3 80 – more on that in a moment. With the aforementioned rule changes coming for 1982, everyone was in limbo, not wishing to expend valuable resources ahead of the new regulations. The Kremers' fun car looked great on paper in this period; the press was excited, so they brought it out to play. The Kremer new 917 replica would see Bob Wollek behind the wheel at the 1981 Le Mans.

With a flat-12 engine giving 570bhp, maybe the ultimate evolution of the 917 – the 'K81' – might have a role to play. It looked quick, and its fuel efficiency looked good. However, out on track it was to suffer the fate of so many. It was a design that was found to be simply out of date, the aerodynamics not up to it, and the tyres available were not suited to the car. It was said that Bob Wollek tried hard, but it turned out to be 16sec a lap slower than had been predicted! Even so, the K81 with Bob Wollek/Guy Chasseuil/Xavier Lapeyre qualified 18th on the 55-car grid. However, it wasn't to be: their race ended after seven hours with a broken engine mount.

The Kremers decided to have another try with the car at Brands Hatch in 1981. Amazingly, amongst a seriously competitive field, Bob Wollek/Henri Pescarolo put the 917 on the Brands track (more twisty than Le Mans), on the second row of the grid, 3rd fastest, pole being taken by the C100 Ford of Manfred Winklehock/Klaus Ludwig. In P2 on the grid were eventual victors Guy Edwards/Emilio de Villota in their Lola Ford. It was round 15 of the World Endurance Championship for Drivers. At the start, Wollek got ahead of Edwards, whilst Winklehock shot off into the distance. But the C100's gearbox let go on lap 40. A surprised Wollek, in the Kremers' 917-K81, found he was battling for the lead. Pit stops came and went, and still the Kremer car kept up the fight, until on lap 52 its suspension cried 'Enough!' The problem was serious enough to put them out of the race. It was the end of the Kremer 917 experiment.

The Kremer 917 at Le Mans 1981, built from scratch by the Kremer team in their workshops from factory drawings, assistance with engines came from Porsche, and inspired aero modifications by the Kremer brothers. A great idea, but not successful. (PK)



A 917 for their own enjoyment, said Kremer, a track-day car. It became much more than this, even though the original design went back into the 1960s, and by 1980 would be regarded as being pretty much out of date. (PK)

The Kremer 917-K81 looked great on paper, looked great on track, but time and the tide of technology meant it was never going to be a serious challenge at Le Mans in 1981. (PK)

Brands Hatch 1981: Wollek/Pescarolo; dnf due to suspension failure. (PT)

Kremer K3-80

Arguably the star of the 935 Kremers was the stunning 935 K80, seen here – the well-known Jägermeister 935.

A cool day in August at Zolder: the K3-80-00011 in the pit lane. (P)

Kremer-Porsche 935 K3-80-00011: John Fitzpatrick, from 3rd on the grid to victory on 24 August 1980, at a DRM race meeting in Zolder. (P)

25 May, Nürburgring 1000km – another Kremer 935, K3-80 000-009: Bob Wolleck/Preston Henn/Adrian Yates Smith, 3rd overall, 1st in GTX over 2-litre. (P)

Starting from 3rd on the grid and fastest of the Gr 5 entries at the 1980 Le Mans 24 Hours: the Kremer K3-80 00013 of Rolf Stommelen/Tetsu Ikuzawa/Axel Plankenhorn. Unfortunately, the head gasket failed on lap 167. (FRAJ)

Another Kremer 935 K3-80: this time chassis 00023, fastest qualifier in the IMSA GTX class, starting from the front row of the grid and looking a likely winner. Dick Barbour/Brian Redman/John Fitzpatrick, adding proof to the speed of these K80 Kremers. It ran in the lead for several hours, but just before the finish it was slowed due to a clutch problem and eventually finished 5th overall and 1st in the IMSA class. (FRAJ)

Kremer K4

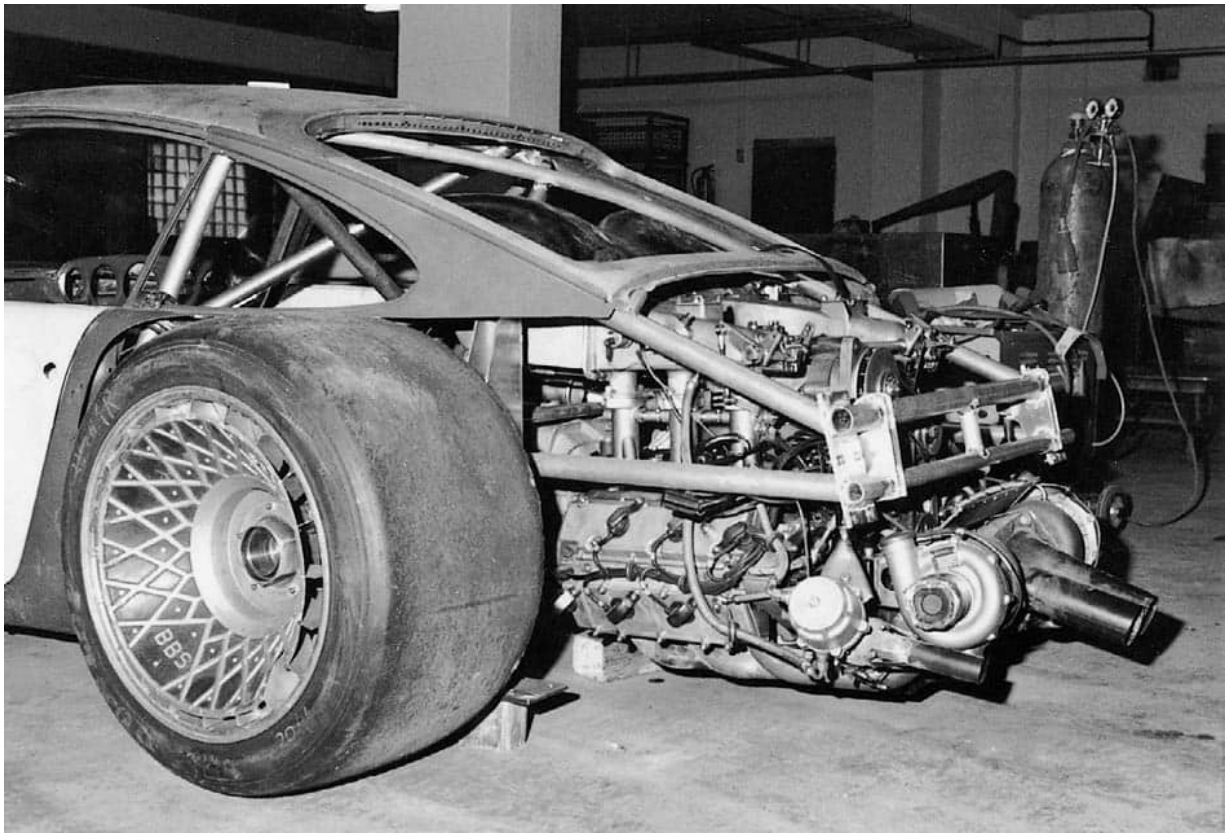
The K3-80 was a stunning machine and it paved the way for the car that followed in 1981: the hoped-for superfast K4. But as we will see, its arrival was to be too late. The problem was that the gestation of the K4 took longer than hoped; the momentum of the K3 was lost and it was only on 21 June 1981 that the K4 was first tested at Wunstorf. Once more, the aero tests – with no wind tunnel – had been done on the Cologne Autobahn!

The ultimate stage of the 935, at least for the Kremer team, the 935 K4 for the 1981 season, was to be an all tube-frame car. Its

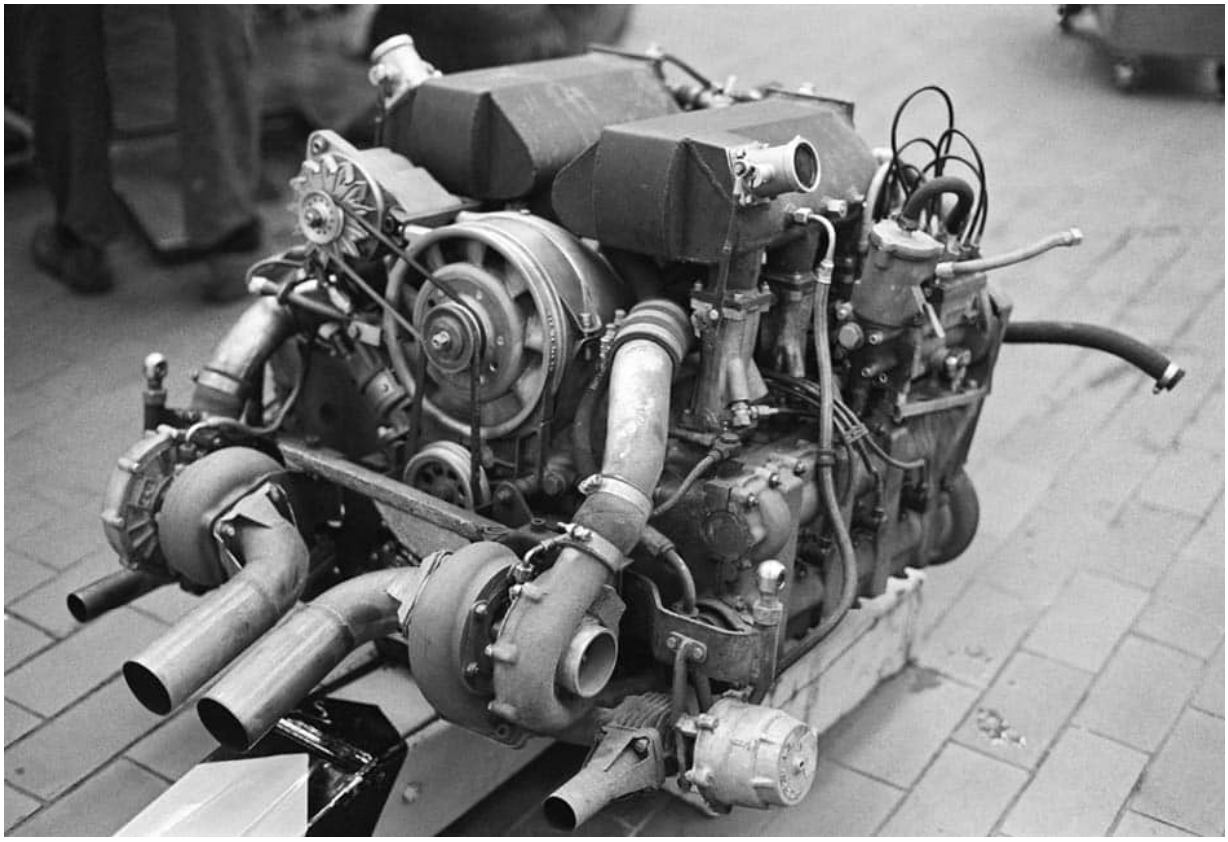
advantages were obvious: a lighter and stiffer chassis, a lower centre of gravity, and better balance of weight distribution than that of the metal-bodied cars. Former Kremer key-man Achim Stroth told the author: “The K3 needed an update: it began to be beaten in 1980 by the Ford Capri of Klaus Ludwig. The Capri was a space-frame car; and it was lighter, lower, stiffer. So this was the way to go. Funnily enough, none of these 935 cars was officially registered as tube/space frames. The homologation regulations required certain main body ‘tub’ parts to still be part of an original production body-shape’s steel body: the main A- and B-pillars, windscreen surrounds, door sills and part of the roof; however, the regulations did not specify what connected these parts to the rest of the body and chassis. The aluminium tubes of the K4 met these requirements, its construction was really just a light cage with sub-frames that served to make the steel ‘tub’ stiffer.” Stroth continues: “Kremer had one of the top drivers, Bob Wollek; they had started to design the space frame during the 1980 season, but the difficulties encountered made it impossible to have the car ready for the 1981 early races – the car broke cover only for mid-season, and out of nine races, Bob finished twice as the winner and four times runner-up. Bob Wollek’s was a right-hand drive car, at his request: so the K4 Jägermeister was built for him like that.

“Wollek was an expert in chassis setup. But you can’t overcome an outdated layout: even though the centre of gravity is dramatically lower than K3, the driver was placed slightly more towards the centre of the car. The space frame allows good space for the fuel cell and front-end components; there was almost nothing common between K3 and K4. Though the front uprights of the K3 found their way into K4, the pick-up points for suspension front and rear are different; intense cooperation with Bilstein aided the construction.”

The 810bhp car could reach 300km/h. The K4 was derived from the shape of the earlier Porsche Werks car, the 935/78. (P)



All tube-frame (space-frame) construction, as we see here with this engine installation: 810bhp, KKK 26 twin turbos. (P)



Twin-turbo KKK 26, flat-six, water cooled, 810bhp: the power to propel the K4s. (P)

The Bob Wollek-driven Kremer K4 ahead of the No 84 M1 BMW of Walter Maurer. (P)

The rear suspension caused a real problem for the Kremers; apparently it took a long time to sort this out. Homologation requirements meant that they had to maintain a swing-arm layout, and this resulted in a huge component. Achim Stroth says: “Uwe Sauer recalls that Erwin Kremer nearly suffered a heart attack when he held this component in his hands. The flat-bottomed car had driver-adjustable anti-roll bars, activated from the cockpit. It took quite some trial and error to get it all working together – a private team like the Kremers couldn’t afford wind-tunnel testing. The A57, highway from Cologne Nord to Düsseldorf, was the test bed for airflow testing. It worked quite well, and only minor adjustments were needed, thanks to Ekkehard Zimmermann – he created the body and aerodynamic design. Zimmermann designed the new rear wing, too, based on just one pillar, and it was Zimmermann’s idea to have the whole tail made from only one piece – lift it off, and you have easy access to all mechanical components. We got the information from those tests with Manfred Kremer driving the K4; Erwin Kremer drove a 928 alongside the K4 and I took photos from the 928 to see what

was happening to the aero streamers."

A second K4, painted black, was built as a left-hand drive car for Ted Field/Danny Ongais, but they never raced it after it arrived at Road Atlanta at the end of 1981. As Achim Stroth says: "Regrettably, the K4 car was in fact too late for European racing: we were all heading fast for 1982 and the new regulations."

As 1982 arrived, we see the start of the new Sports Prototype regulations, and attention would switch to thoughts of Gr C Sports Prototypes. Meanwhile, sales of the Kremer 935s would reach a peak, with many teams in the USA wanting Kremer cars. In Europe, Gr 5 was over. But in the USA, IMSA GTX was waiting. Kremer was moving on, too.

Achim Stroth (right), team manager and racing guru for Kremer for four decades, with the author at the Essen Classic Show in 2016. (JS)

The A57, highway from Cologne Nord to Düsseldorf, was the test bed for airflow testing. Achim Stroth says: "Manfred Kremer driving the K4, Erwin Kremer drove a 928 alongside the K4, and I took photos from the 928 to see what was happening to the aero streamers." (AS)

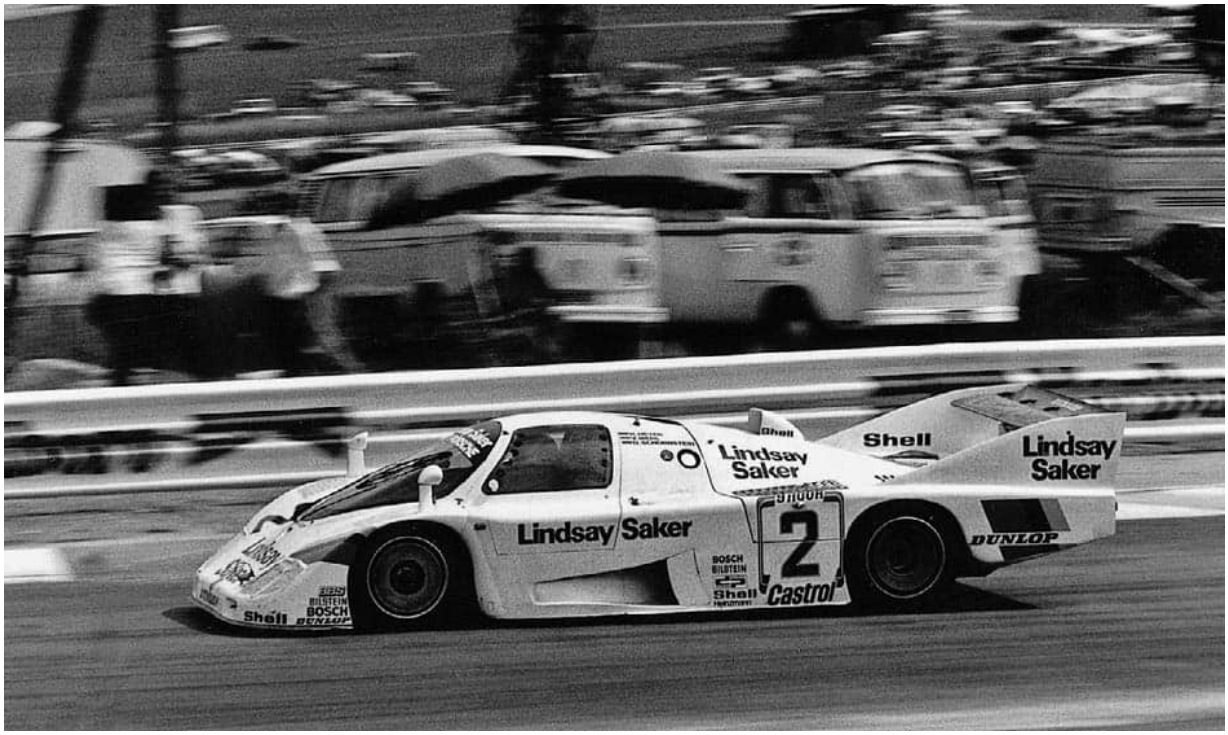
Kremer 936 to CK5

For the new Gr C formula for 1982, Kremer would need a new car; the new Porsche 956 at the time was not available to buy. So the first attempt to get into the game quickly saw the brothers deciding to create a modern version of the 936 – a car developed by Porsche in 1976 as a development of the ageing 908. The 936 had served its purpose well for Porsche itself, but it too was getting long in the tooth when, in 1981, the highly refined famous Jules-sponsored 936/81 of Derek Bell/Jacky Ickx (a newer updated version) won the Le Mans 24 Hours. Kremer, as it had done with the 917, had decided to build its own 936 space-frame car from drawings and details supplied direct from Porsche Weissach. The result was the 936/82, a 2.1-litre, Porsche-powered, stop-gap competitor for national and international races in and around Germany.

Meanwhile, Reinhold Joest (who we will see in a moment) had

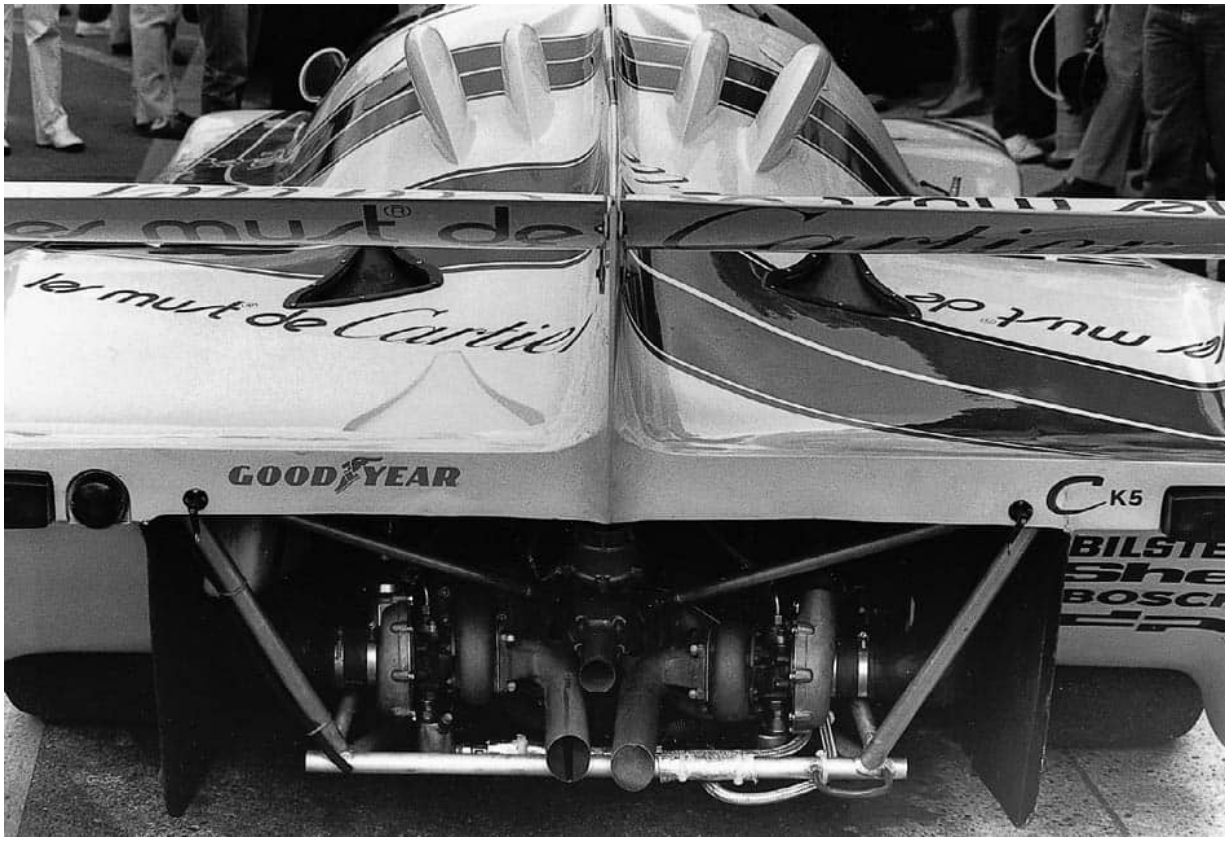
gone another route, and created a closed-cockpit 936, a Type 936 C: the JR-005. This gave the Kremer brothers an idea: to create an aluminium tubular space-frame car, along the lines of a combination of a 908-3 that Kremer had also built themselves, and the 936, but enclosed like the K81 917 and similar to the Joest car. Ekkehard Zimmermann, DP Motorsport, was once more asked to create the body. The plan was to create a car to run in the new Gr C Prototype class in 1982/3. It was called the CK5. In contrast to the Joest variant, the wheelbase of the CK5 grew around 20cm over the Joest 936 JR-005. The Kremer CK5 used 16in BBS wheels, with the brake system of the 935 K3 and 935 K4. The CK5's four-speed transmission came from the 917/10, a Porsche type 920. A 2.8-litre air-cooled turbocharged engine was installed that gave, according to boost, from 630 to 720hp – more than the factory 956 at that time. The arrangement of engine and gearbox in the 936 also allowed the use of some ground-effect aerodynamics: it has to be said not much, but by designing the central fin on the engine cover they achieved improved lateral stability.

The (#8) Kremer 936-82-1, Porsche 2142cc, compression ratio 6.3:1 up to 7.0:1, 540bhp at 8000rpm. Twin KKK (Kant, Kopp, Kausch) turbos, boost adjustable by the driver using dashboard-mounted control. (P)



Kyalami 9 Hours, 6 November 1982: the Joest JR-005 936 C, a closed-cockpit version of the 936. (P)

The aluminium tube frame, Kevlar-bodied Kremer CK5-01: 345km/h (214mph) on the straights, said to be quicker than the Werks 956. Pictured here at Le Mans, on this occasion the car flattered to deceive: its 2344cc flat-six Porsche 550hp failed on lap 25 due to lack of pre-event testing. (P)



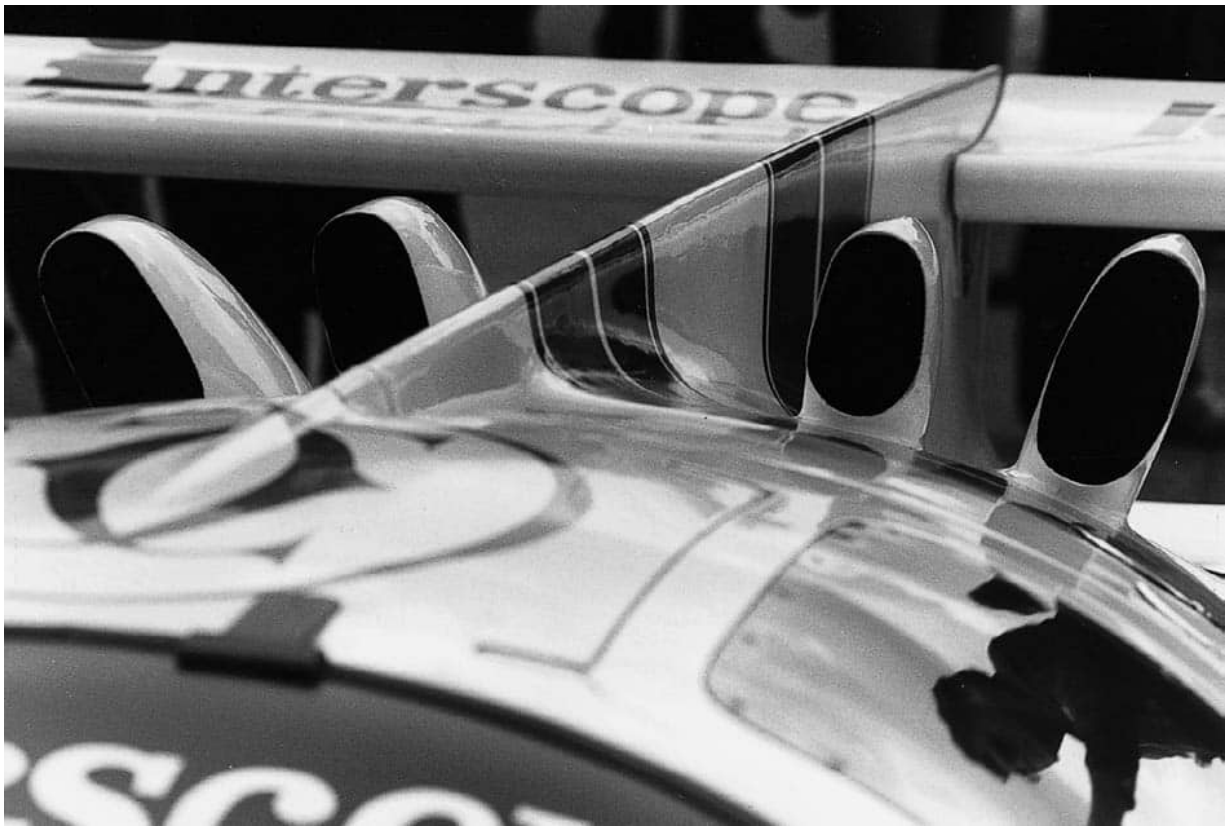
The twin turbos of the Porsche 935/76-developed engine in the CK5-01. (P)

The Kremer CK5-01 first ran competitively in 1982 at the Le Mans 24 Hours, driven by Bill Whittington/Ted Field/Danny Ongais. It was a smart-looking car, but testing had been limited, and at Le Mans it failed on lap 25, when the engine let go. Entered by Kremer, the car was quick in a straight line but less so on the corners, although it had qualified 8th on the grid.

The Kremer CK5-01 achieved one victory in 1982 at the Hockenheim ADAC Hessen Cup on 29 August, in the hands of Rolf Stommelen. Stommelen also scored two 5th places before an enforced dnf at the Spa 1000km: starter failure at a pit stop. He bounced back, though, to 3rd on 26 September at the Bilstein Supersprint at the Nürburgring.

The Kremer team decided at this point that it was time for the CK5-01 to move on. British privateer Richard Cleare and his team would be its next owner. Team member at the time, Peter Twitchen, told the

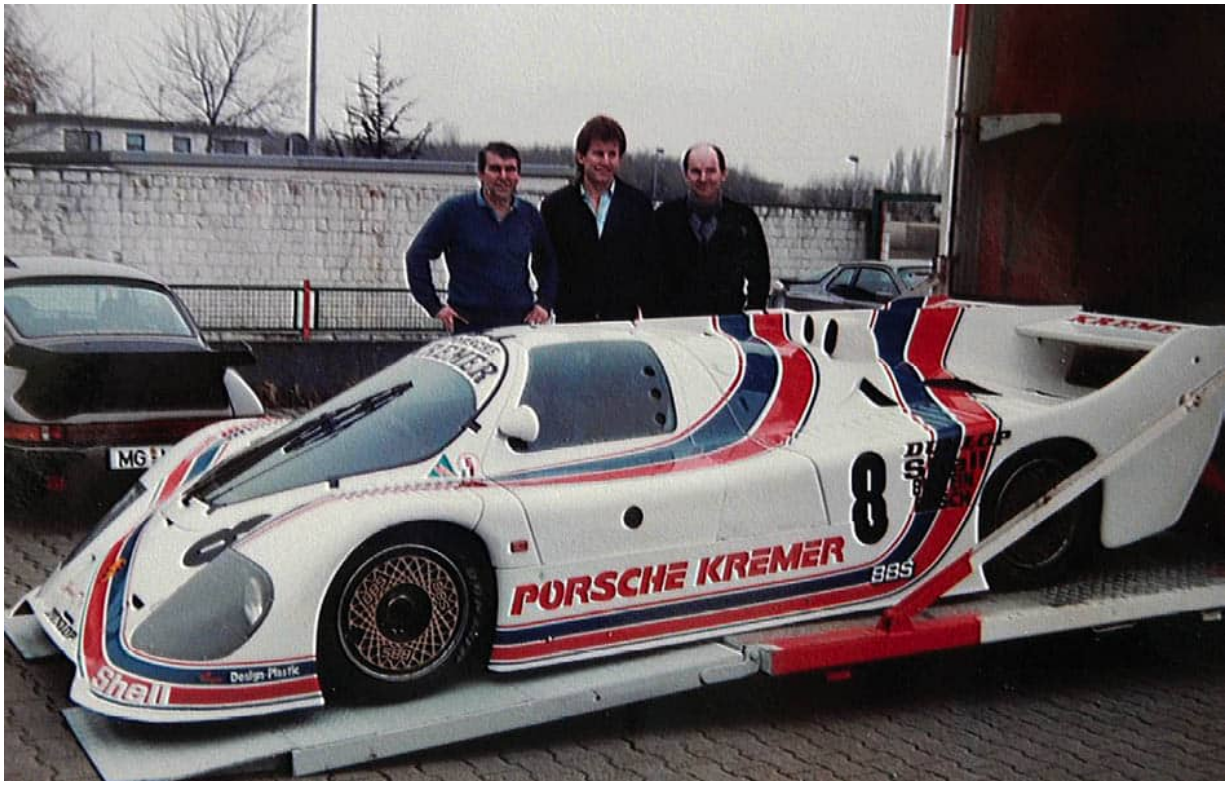
author: “After the sale of Richard’s successful Gr 4 Porsche 934, he contacted the Kremers, and travelled to meet Erwin and Manfred Kremer, where he reached agreement to purchase the CK5-01.” Richard was no stranger to racing at high level, having competed in the Autofarm-entered 934 in the early part of 1980, and setting up his own team to continue racing through 1981/82 in many international races, taking a first in GT with the 934 on four occasions, including the 1982 Le Mans 24 Hours, where he also finished 13th overall.



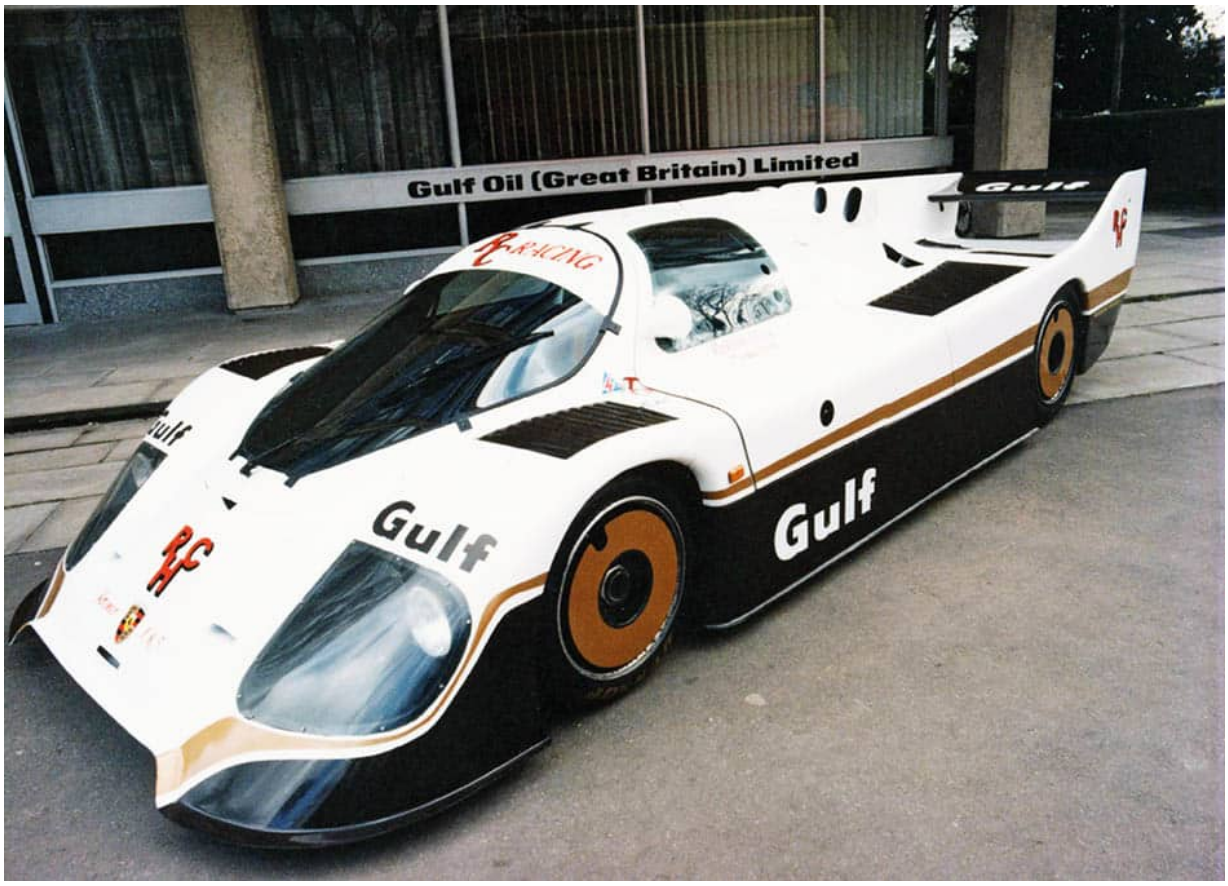
One picture can say a thousand words: here we see the then futuristic fin and air intake positions of the Kremer CK5-01. (P)

The clearly visible dorsal fin on the CK5, seen here on 17 October 1982 at the Brands Hatch 1000km, where it finished 6th in the hands of John Paul Jr/Frank Jelinski. (PA)

3rd overall at the DRM-ADAC Bilstein sprint race from P2 on the front row of the grid: Rolf Stommelen. (P)



Collection day: the truck is about to be loaded with Richard Cleare's new purchase; Don Holland, Richard Cleare, Erwin Kremer in Cologne, 1983. (PT)



The Kremer CK5 in presentation trim and the Gulf colours of the period, on display outside the new sponsor's UK headquarters in Cheltenham in 1983. (PT)

Peter Twitchen: "Richard and Don Holland – his team mechanic – transported the car back to Burnham, where Richard had his oil distribution company base. The car came with some spare parts included in the sale, but Richard further purchased a complete set of body panels from Kremer, and a spare 3-litre 935 engine from Charles Ivey."

Richard Cleare then went looking for the all-important sponsorship for the 1983 season. Success came with some support from Gulf (GB) Ltd. Peter Twitchen: "Once back at the team's base in Burnham, the car was stripped back to the bare chassis frame, and all the mechanical parts were checked, along with the body and panels being resprayed to suit the sponsorship. The car was presented to Gulf (GB) Ltd and displayed outside its offices in

Cheltenham, followed by a Silverstone track test which included an opportunity for journalists to take a Gr C ride alongside Richard or Tony Dron," said Peter. "Although Silverstone was scheduled by the team to be the car's debut race, an agreement through Porsche saw American driver Margie Smith-Haas join Richard and Tony for the opening race at Monza on 10 April 1983, race No 19. The Kremer brothers and two of their mechanics joined the team at Monza to help the car through scrutineering, and also an engine change! This came about because the original 2.8-litre Kremer engine failed in practice."

The first test of the new car, taken directly from Cheltenham the same day as its first presentation at Gulf. The Gulf Richard Cleare Racing Team, (L to R): Don Holland (chief mechanic), Peter Twitchen (team manager), Richard Cleare (team owner/driver), Geoff O'Connor (mechanic), George Hockley (Gulf), far right: Tony Dron. (PT)

Silverstone: Round 2 of the World Endurance Championship. The Kremer CK5-01 chassis, Tony Dron and Richard Cleare, 6th overall of the 27 finishers from 13th on the grid; things were looking promising for the future. (PT

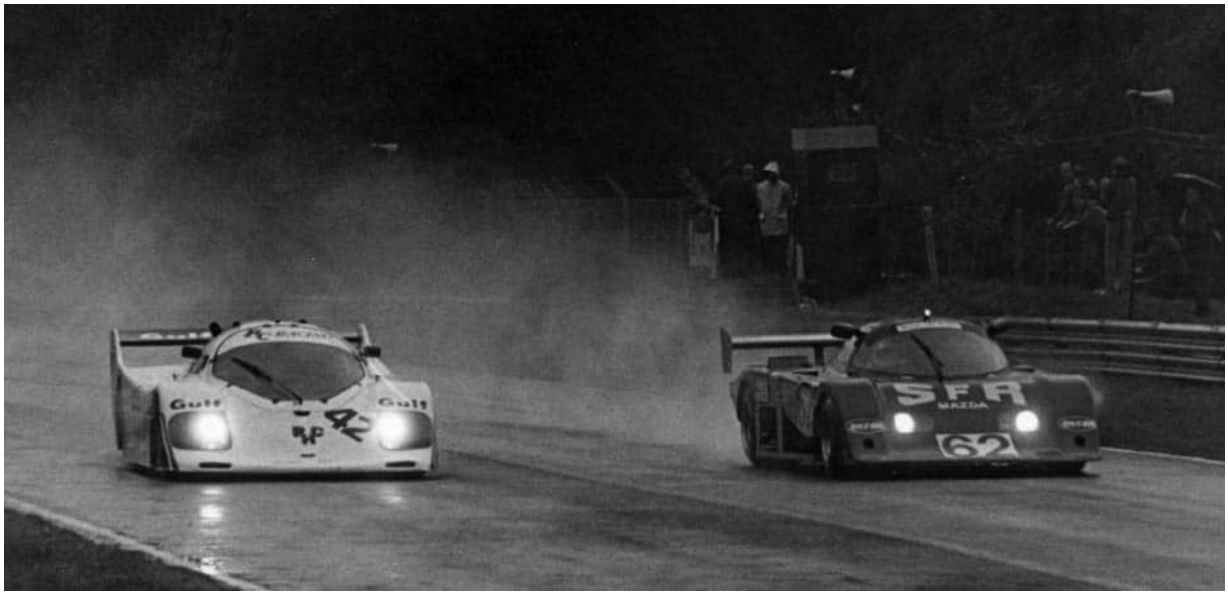
Tony Dron told the author: “The engine failure in qualifying at Monza was spectacular, resulting in a huge fire. I was driving when my mirrors were suddenly filled entirely with flames just behind me. I kept going to the next marshals’ post, late in the Curva Parabolica, where they surprisingly leapt into action with fire extinguishers immediately. Without them the car might have been a total loss. The spare ex-Charles Ivey 935 3-litre was installed. The car qualified 10th.” “In the race, by the time of the first refuelling stop, Tony had moved the car into 8th position,” says Peter. “Margie Smith-Haas took over, but soon afterwards spun off, beaching the car. Race debut over. A month later at Silverstone on 8 May, Tony and Richard started from 13th on the grid, in the car now numbered 42, and drove well to finish

6th, behind five of the then-dominant Porsche 956 works and private entries."

Peter continues: "After Silverstone, the CK5-01 underwent a complete overhaul at the Burnham workshop with Don Holland, new team mechanic Roly Moate, me and Richard preparing the car for Le Mans. The 3-litre engine had been returned to Porsche for a rebuild."

For Le Mans on 18-19 June, Richard and Tony were joined by Richard Jones. Peter Twitchen: "During Wednesday and Thursday practice a detached floor panel lost us valuable set-up time, but using the 2.8-litre engine in practice, and running with race settings only, the car was qualified 24th on the grid. We installed the rebuilt 3-litre engine on the Friday." (Author's note: it is customary that no practice or qualifying takes place on the Friday of the race weekend at Le Mans.) Unfortunately, it was to be a disappointing weekend. Peter Twitchen: "The car retired in the first hour of the race when the factory-rebuilt engine let go due to exhaust valve failure." For a small team this was a real setback. They would have to miss out on several races whilst the engine was rebuilt again. Tony Dron says: "I remember the chassis used to flex a bit, and Richard was for ever having to get new windscreens." The CK5 would come out again on 18 September for its last race of the 1983 season at Brands Hatch. The race, run in torrential rain, again saw the car retire with engine failure, this time with Richard driving; it was the Kremer 2.8-litre unit.

Le Mans 1983: the car retired in the first hour of the race when the rebuilt engine let go due to exhaust valve failure – a pity, as it is recorded as being pretty quick on the straight parts of the circuit. (P)



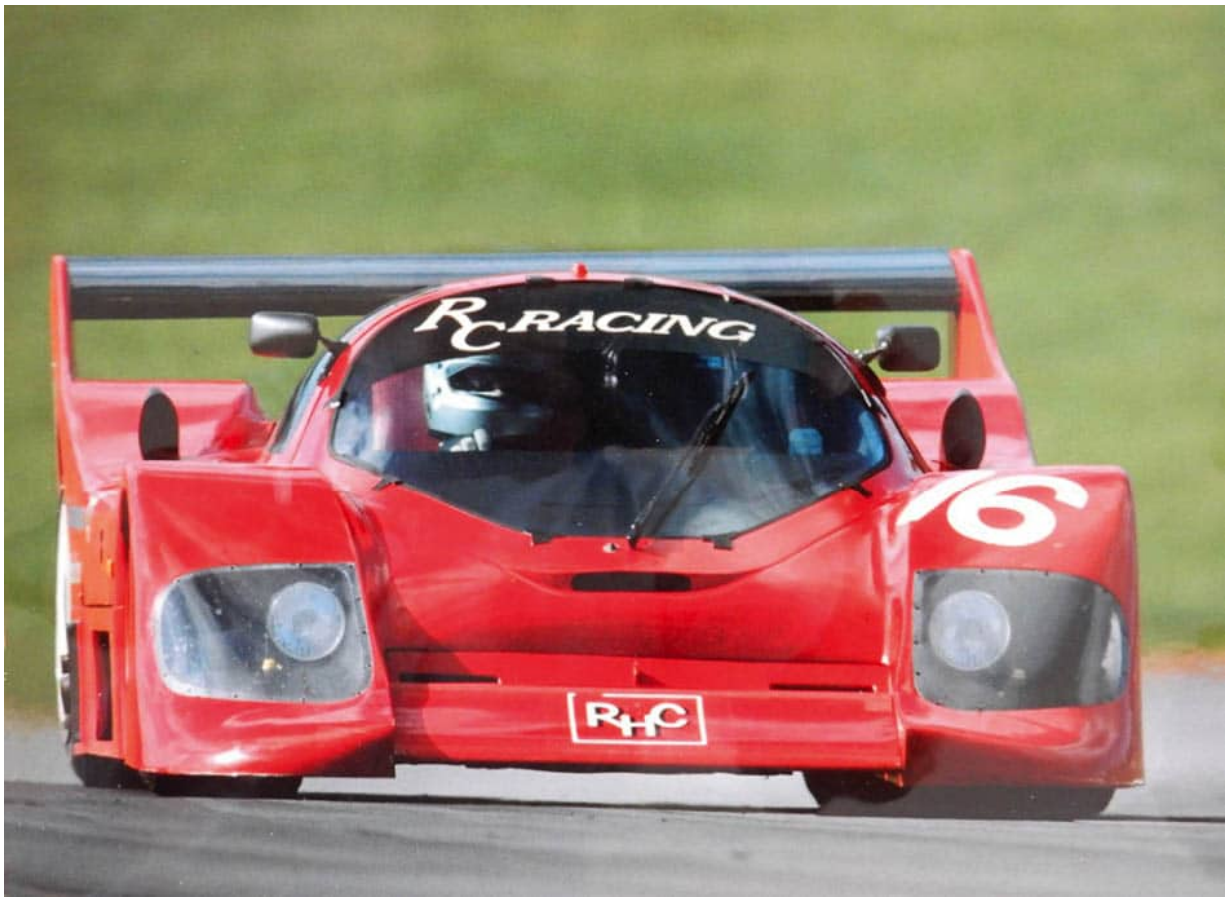
The Cleare CK5 (left), 18 September: its last race of the 1983 season at Brands Hatch. Tony Dron says: "I had a front wheel come off and also loss of rear brakes at one point – dodgy stuff." The race, run in torrential rain, again saw the car retire when Richard had the engine let go on him. This time it was the Kremer 2.8-litre motor. (PT)

Peter Twitchen: "At the end of 1983 we took the car to MIRA (Motor Industry Research Association) for a series of wind-tunnel tests; the results became the basis for a new ground effect package being initiated by Val Dare-Bryan, a freelance design engineer, ex-Richard Lloyd team. For 1984 the Kremer space-frame chassis was also re-configured, the work carried out by Martin Slater at Lyncar Engineering, to allow the introduction of a new front, rear and sidepod body panels. The underbody, which in the original Kremer design had little ground effect, now included a fully enclosed aero package. The trademark dorsal fin and inlet trumpets were replaced by a full-width rear wing, and low-line air inlet. Mechanically, the car changed from using the existing four-speed 917/10 gearbox to a Hewland five-speed unit, lighter and easier to service. Turbochargers and exhaust outlets were now mounted laterally as on the 956s, instead of the original rear position as on the 935s. Little remained of the original CK5 design other than the centre chassis section and the suspension

set-up. The car competed only once, in 1984 at Brands Hatch on 28 July, running No 16, where it was withdrawn when we found the fuel tank was being over-pressurised." (In some records it states suspension failure, but Peter confirms it was definitely the fuel pressurisation problem.)

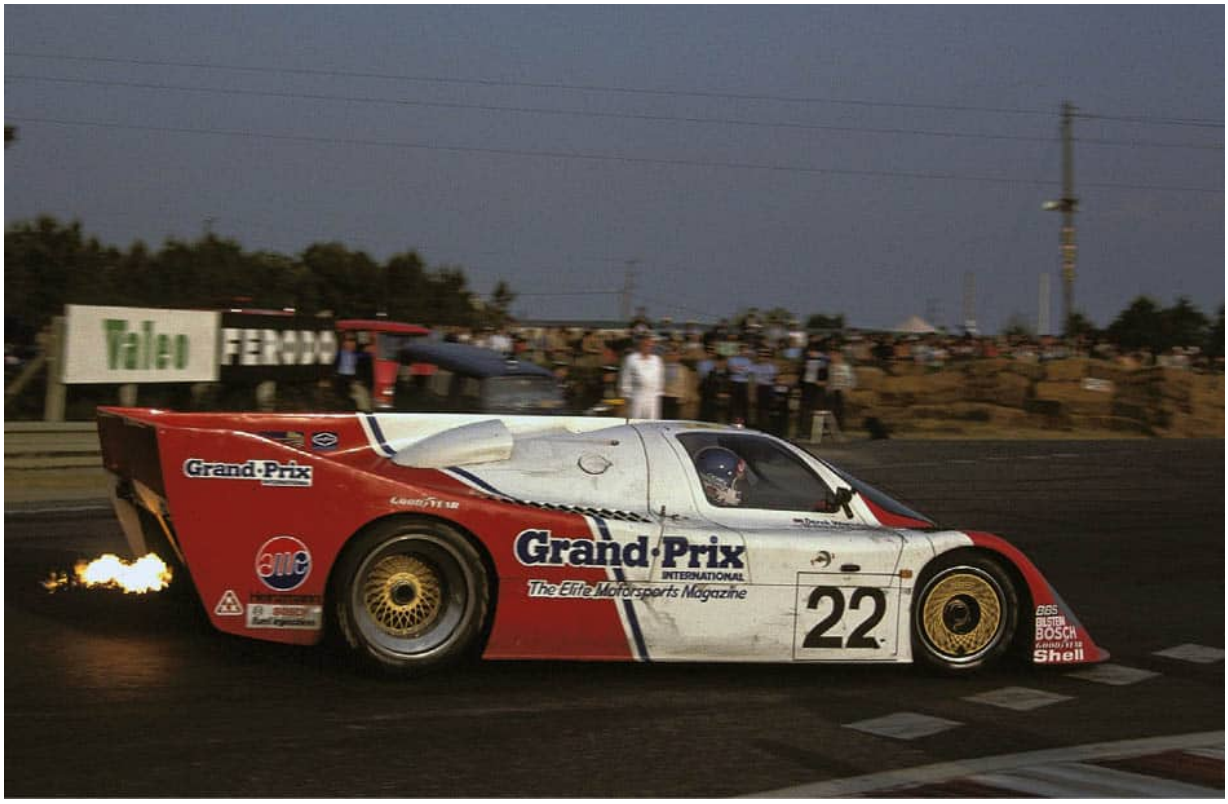
Peter continues: "For 1985 the aero package was modified to include an adjustable wing section set into the front nose panel, and the adoption of 19in rear wheels to replace the original 16in design." The car ran at Brands Hatch in 1985 with Richard Cleare and David Leslie qualifying 18th, retiring on lap 59 with exhaust manifold fracture. It was at this point that Richard Cleare decided to look for a replacement race car: we will read more about this in the section on March Engineering.

When Richard Cleare acquired the CK5-01, the Kremer brothers had already decided to build a second 936-based car, and this became the CK5-02. It was to enjoy a good run, apart from a disappointing start in its first race at Le Mans in 1983. Entered by the Kremer brothers with sponsorship from *Grand Prix Magazine*, the car looked as spectacular as ever, but it was to end in tears after just 76 laps, when exhaust failure led to the demise of the car. It raced on 3 July, netting a 13th-place finish in race one, and 5th in race two of the Norisring Trophy 200 Miles. It was a non-starter at Spa for the 1000km, but at Brands Hatch on 18 September, Franz Konrad and Kees Kroesemeijer finished 12th.



A now-modified Richard Cleare Kremer CK5. Peter Twitchen explains: “We tried several different aero modifications during our time with the CK5, and here we see the different nose with an airfoil section replacing the conventional smooth front end; this is at Brands Hatch, 22 September 1985.” (PT)

CK5-02, Le Mans 19 June 1983: Derek Warwick/Frank Jelinski/ Patrick Gaillard. Having qualified 14th of the 54 cars, making it eligible to start the race, a broken exhaust led to a dnf on lap 76. (P)



Dusk descends at the 1983 Le Mans 24 Hours in this atmospheric period shot. The car would race again shortly after at the Norisring on 3 July, netting a 13th-place in the Norisring Trophy race with Frank Jelinski driving. (P)

There was a wasted trip to Kyalami for the CK5-02 due to a disqualification at 196 laps following a push-start during the 1000km Round 7 of the World Endurance Championship.During 1984, the 02 car would enjoy one victory, a 3rd, two 4ths, a 5th, and a 6th in numerous rounds of the European Interserie Championships, mostly in the hands of regular Kremer driver of the time Kees Kroesemeijer. It would also find its way to Australia for the 1000km Sandown Park World Endurance Championship race; Kees Kroesemeijer/Jesús Pareja-Mayo/Peter Janson were the drivers who qualified the car 16th, resulting in a 17th-place finish.

A third CK5-03 was made but ran infrequently, with a best result of 3rd overall at the Siegerland Interserie race on 9 September 1984. In 1988 a CK5, thought to be the CK5-1, also showed up at the Tampa

World Challenge on 27 November; it was to finish 9th, driven by Norbert Przybilla and Kurt Hild, a familiar name from an earlier period.

Kremer then decided to take the route of everyone else, acquiring a 956 factory car. Achim Stroth told the author: “For 1984, we kept the 956 Porsche original; we had bought it in 1983, and raced at Silverstone in 1984. In preparation for Le Mans, a works chassis 962-110 was acquired, but it did not run at Le Mans, where we ran two Porsche-built 956s. The 962-110 was the monocoque that Manfred Winklehock would crash – fatally, sadly – on 11 August 1985 at Mosport. It was later rebuilt using a John Thompson TC Prototypes tub, but still numbered 962-110.”

The CK5-02 at Brands Hatch on 18 September 1983: Franz Konrad and Kees Kroesemeijer finished 12th. (PA)

Sandown Park 1000km in Australia in December 1984 was a round of the World Endurance Championship for Drivers. Kees Kroesemeijer/Jesús Pareja-Mayo/Peter Janson qualified the car in 16th, resulting in a 17th-place finish. (P)

CK5-02: George Fouché/Kees Kroesemeijer came 15th overall at the Nürburgring 1000km, 15 June 1984. (P)

The CK5-02 at the Interserie Hockenheim for a German National Championship round on 21 April 1985. Note the aluminium strips aero experiment above the front wheelarches. (P)

CK5-02 would later be restored for a private owner in the colours of Walter Wolf; drivers listed on the door are Bellof/Stommelen. (JS)

Manfred Freisinger carried out the work in his Karlsruhe workshops. (JS)

A CK5 also showed up at the Tampa World Challenge on 27 November 1988; it was to finish 9th, driven by Norbert Przybilla and a familiar name from an earlier period, Kurt Hild. C-1 is lettered on each side of the rear cover. (MS)

In the store at Kremer in the 1990s: a Kremer CK5. We are not sure of the chassis number. (JS)

The Norisring 200, 29 June 1985: Winklehock in the short-tail Kremer-run 962C-110; a front-row grid position, but in the race he would slip to 5th overall. (P)

Kremer chassis records indicate that, in the period, Porsche supplied three plain-sheet aluminium monocoque chassis to Kremer, 962-110, 114, 118. However, Kremer, like many others, had already turned to alternative chassis, such as those by Thompson in the United Kingdom, who was by then building with honeycomb sheet. Two fatal accidents in 1985 with cars using single aluminium sheet monocoque construction led to Porsche itself looking at this method of construction. Indeed, all the monocoques made in Porsche from 1986 were of honeycomb construction, and footwell boxes were offered to clients to retro-fit on existing chassis. However, it is stated by former members of the Porsche construction team that in-house tests were inconclusive as to whether the honeycomb construction was better. It was also stated that, in fact, the two fatal accidents were so severe that nothing, at that time and with the knowledge available, would have saved the two drivers: Manfred Winklehock, who died at Mosport, and Stephan Bellof at Spa.

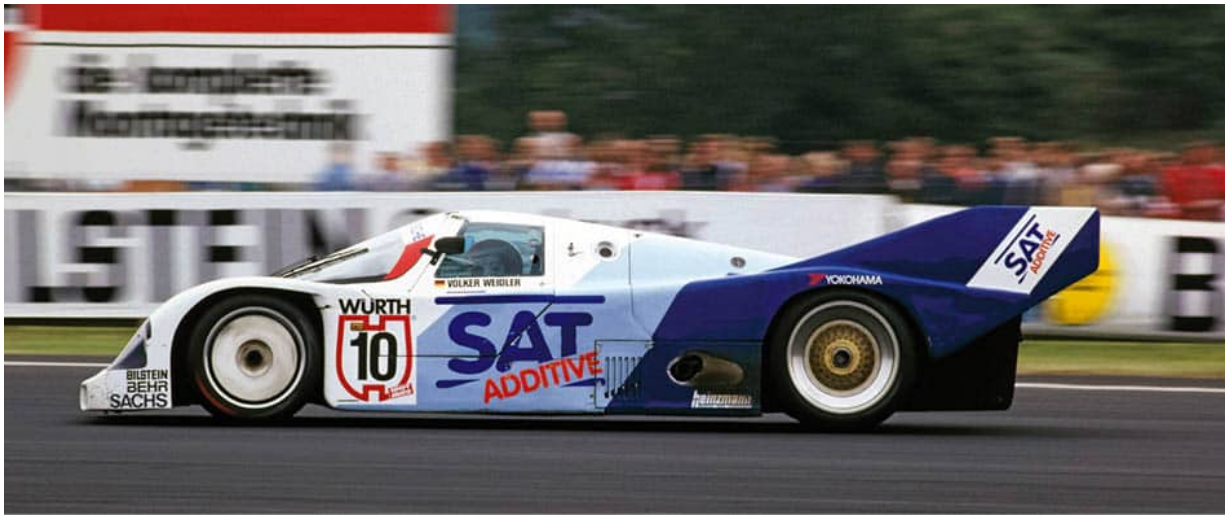
At least seven of the new-style 962 honeycomb chassis were

acquired from John Thompson and built into cars by Kremer between 1986 and 1990 to race on the international scene.

The first Thompson-chassis Kremer car appeared at the Nürburgring 1000km on 24 August 1986: chassis 962 C (like the original factory car, also labelled 114). It was the year of the multi-accident wet race, and the car was withdrawn, as were many others, on lap 21. At Spa on 15 September, Kremer appeared with a Thompson chassis 962-118 (assumed to be a replacement for the original factory 118). In the hands of Bruno Giacomelli/Volker Weidler, it would finish 12th overall. The Thompson replacement chassis 110 would be fielded by Kremer at the Jarama Sprint race on 22 March 1987; Volker Weidler/Kris Nissen would finish 4th overall.

Le Mans 1987: scrutineering the 118 CK3, the Thompson-chassised car built up at Kremer. Driven by George Fouché/Franz Konrad/Wayne Taylor, it came home 4th overall, and finished 8th in 1988. It is said around five different chassis 118s were seen in the following years! (P)

Long-tail bodywork on the 962 CK6 110 (the rebuilt Kremer car with the Thompson honeycomb chassis) in 1987 at the Le Mans 24 Hours during practice. Nissen/Weidler/Takahashi went out just 30 minutes into the race when the engine failed. This car would eventually go to the Almeras team for 1988 and 1989. (P)



The Kremer 962 110 CK with short tail bodywork: Volker Weidler driving in the Diepholz Supercup, 9 August 1987; dnf, following a spin. From Spain to Japan, this car would race many times during 1987. (P)

At Le Mans in 1987, the 962 CK3 118 would finish 4th overall, the 'C' being the type – Gr C – and the 'K' being for Kremer project.

Kremer 962 CKs, the TC Prototypes, Thompson chassis Kremer cars, would race some 46 times from 1987 to the end of 1989. Motor racing history records that there was a huge surprise for the motor racing fraternity at Monza, in the spring of 1987. Porsche put out a press release announcing that the factory team was to be disbanded as soon as the Le Mans 24 Hours was over. The statement included one of the reasons as: “the desire to concentrate resources on an Indy car programme.” This would have extensive ramifications, not only in Europe, but in Porsche’s largest market – the USA – which we will pick up shortly.

Kremer created another new car that would be known as the Kremer Type CK6, still a 962, constructed using a honeycomb aluminium chassis, again from John Thompson. It first ran at the Fuji 500km on 3 March 1988, where the green-liveried Leyton House car finished 2nd with Kris Nissen/Harald Grohs at the wheel. It would stay in Japan with Leyton House Racing through 1988. An updated chassis came along in 1989, called a CK6 89/1, one of two chassis constructed using carbon composites, called a type CK6-K. Kremer is quoted as saying that these chassis were 12kg lighter than the honeycomb aluminium chassis, which required the team to carry ballast to meet the regulations.

A new 962 CK chassis 88CK, again with a Thompson chassis tub, appeared at Le Mans in 1988. This would be the Kenwood-sponsored car of Giacomelli/Takahashi/Okada, which came 9th overall.

Here we will leave this decade for the Kremer part of our story; we will look at the next generation of cars in the next chapter covering the 1990s.

Le Mans 1988: Giacomelli/Takahashi/Okada in the updated CK6, now CK6/88 CK6, a Thompson monocoque honeycomb chassis, the engine being the 935/79 2826cc type, 9th overall in the race. (P)

The CK6-02-962 built by Kremer, seen here at the Nürburgring 500km 1989: George Fouché/Giovanni Lavaggi, classified 3rd overall. (P)

Kremer 962 CK6 118CK back at Le Mans in 1988: Kris Nissen/George Fouché/Harald Grohs, 8th overall. (P)

GKW-Porsche

The GKW 862-01, built in 1988, was the creation and work of Gabriele Gottifredi.

Gottifredi was a racing man and had competed at many levels in hillclimbs, and in everything from Ford Escorts to VW Golfs to Porsche 930s and 934/5s on the tracks of Europe.

Commenting on her husband's career, Paola Gottifredi told the author: "A Swiss driver had contacted us to run with Gabriele in the 1988 Championship with the GKW that Gabriele had designed and built, but then the sponsor withdrew and the project was abandoned. The car had a honeycomb monocoque/aluminium composite material chassis and Kevlar bodywork. The main feature was lightness combined with strength. We never got to the test the car, but the next owner did. We closed Gottifredi Racing in 1992 due to differences with a partner." Now, following that initial glimpse of the story, we look at the remainder. Swiss driver Claude Haldi was involved in the project, and the car was registered to run at Monza, Fuji and Le Mans, but was only to be seen at Monza (though it did not race). At the time the car had a former John Fitzpatrick engine, a 956 3-litre

engine, number 120. Weighing around 700kg, it had 750bhp available.

The GKW, completed and standing in the Olgiate Molgora workshops of Gabriele Gottifredi, where it would rest for 10 years before being rescued by one Massimo Ronconi. (GG)

The GKW in its final finished form at the Adria International Raceway near Adria in the Veneto region of Northern Italy. (Ron)

The GKW runs again, seen here at the Classic Le Mans meeting, 2016. (FRAJ)

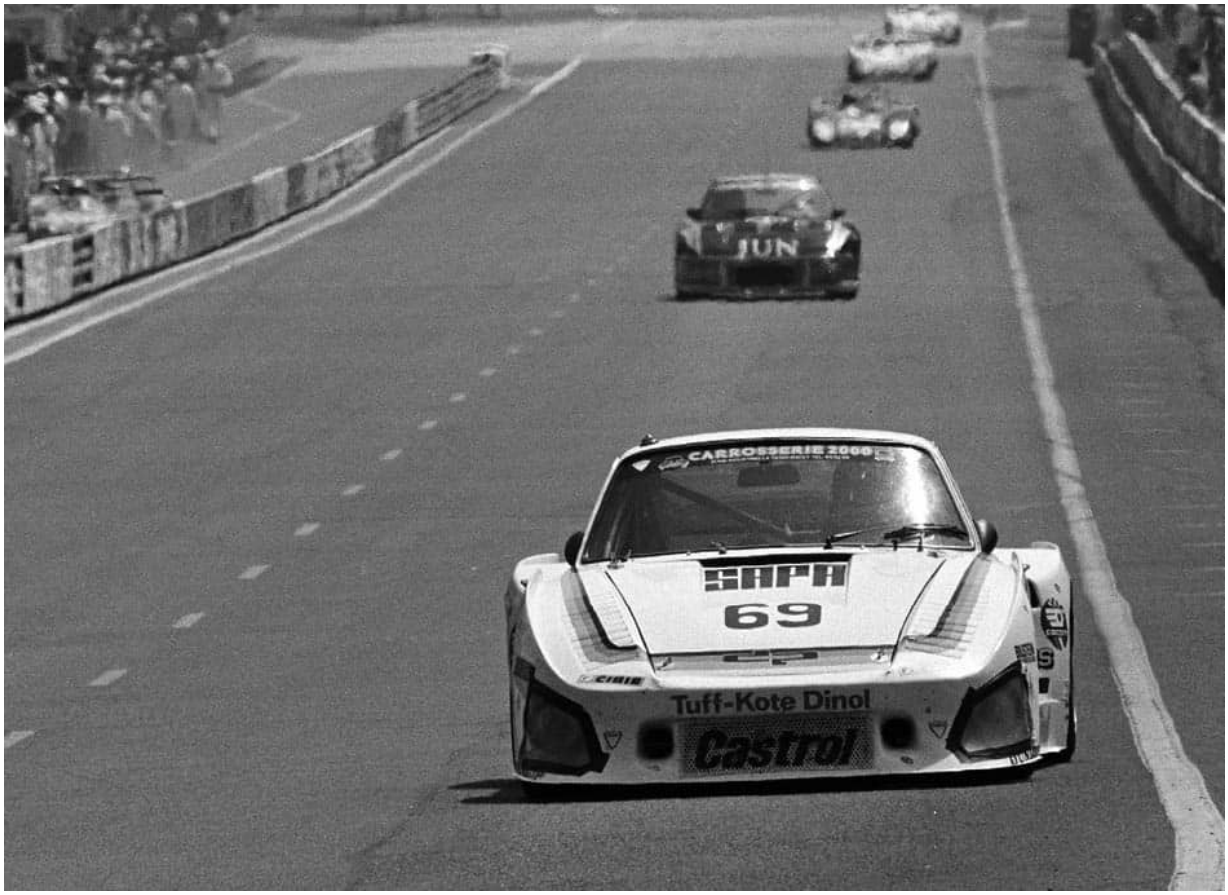
When the project closed, the GKW rested for nearly 10 years, until 2002, when along came Massimo Ronconi, who purchased the car and a lot of spare parts. Ronconi set about a complete rebuild, a task that took nearly three years. It was decided not to use the 956 engine but to fit an IMSA-spec 962 air-cooled engine from Rennsport, near Modena in Italy. This engine was developed and mapped by RS Tuning in Germany. The power unit when completed developed 675bhp with high torque capabilities. The car's suspension was subject to a study and rebuild by two technicians from Dallara. Massimo Ronconi told the author: "When we finished the car, it was tested by myself and pro driver Denny Zardo at Adria Franciacorta and at Modena Airport. I did not get rid of the 956 engine, but kept it as a spare. Eventually I sold the car to a colleague, Massimo Guerra, who raced it in 2016 at the Classic Le Mans." Sadly, the author learned of the passing of Gabriele Gottifredi in the latter part of 2016, and so for his wife and the car's second owner, we offer this section on the GKW as a small tribute to a genial and skilled operator.

From 1988 to 2016, a long journey for the Gabriele Gottifredi GKW Porsche. (FRAJ)

Lundgardh 935-L1 Porsche

In 1977, Porsche had decided to create a special 2-litre 'baby' version of the 935/77-2.0 designed to enter the arena of the 2-litre National class of racing in Germany, where BMW and Ford were

dominating the home-market televised events. Specifically, the effort was to be aimed at the German National Championships, which were important to Porsche in terms of home-market image due to the TV and news press exposure. The cars in this class had to weigh 735kg, using an engine no larger than 2-litre. This did not mean it had to have a capacity of 2-litre, but merely to fit the class. Porsche created a flat-six engine with a capacity of 1.4-litre, a bore of 71mm and a stroke of 60mm; the type 65/2 developed around 370bhp. With a turbocharger fitted, this brought its capacity to just under 2-litre, due to the FIA's imposed equivalence factor of 1.4. It set about weight saving, and built a lightweight tube frame behind the cabin to take the engine components. Superlight GRP bodywork was installed on the car, which was built in just eight weeks. Once sorted, it was quick, winning at Hockenheim on only its second outing. Porsche, though, was racing to prove a point: that it could beat the competition whenever it liked! It did not pursue the project further as it was not, post-Hockenheim, favoured by Porsche management, and so the project was parked up.



At Le Mans in 1981: No 69, with Lundgardh/Mike Wilds/Axel Plankhorn in the Eberhard Braun-built copy of the 935/77 'baby' Porsche, featuring a flat-six 1400cc turbo unit and bodywork by Kremer. (P)

The L1 Lundgardh 'baby' 935 at Brands Hatch, 27 September 1981: Jan Lundgardh/'Umberto Calvo.' Qualifying 30th on the grid of 33, the car came through to finish 19th overall and win the under 2-litre Gr 5 class. (PA)

That is where a few years later, in 1980, Jan Lundgardh came in. Porsche top engineer Eberhard Braun built a new car for Lundgardh, with a 1400cc turbo engine. This car had a tube-frame chassis and lightweight panels with K3 Kremer bodywork. The car was first seen at Brands Hatch on 16 March, where it was qualified 25th on the grid; in the race it was not classified. Two outings at the Nürburgring followed: 10th in the Division 2 race in March, dnf in May. The car ran in a number of Regional DRM races in Germany through the rest of 1980. In July, at Diepholz it came 5th, then 7th at Zolder in August, both results in the Division 2 class. A trip to the Vallelunga 6 Hours in September saw Jan Lundgardh partnered by the car's builder,

Eberhard Braun; they finished 13th overall, running in the Gr 5 class. Two more races finished off the season, neither with significant results. Into 1981, and the Baby 935 dnf'd at the Silverstone 6 Hours in May, then, at the Nürburgring 1000km, it did finish but in 40th overall. It ran at Le Mans in 1981, No 69, with Lundgardh/Mike Wilds/Axel Plankhorn behind the wheel. They qualified 50th on the grid of 55 starters. However, engine failure intervened at the 49-lap mark. Funds were getting tight, but Lundgardh continued to try to run the car, achieving 1st in class at Brands Hatch 6 Hours in 1981, coming home 19th overall.

In 1982, the car ran at the Silverstone 1000km, qualifying 35th on the grid of 39 and finishing 14th overall, Lundgardh being joined by Per Stureson on this occasion. With investment short, the car was parked up until in 1984, when it turned up at the Silverstone 1000km with a 2.8-litre flat-six Porsche engine having replaced the 1400cc turbo. It qualified, but for some unrecorded reason did not start the race. The L1 next appeared at the Nürburgring 1000km on 15 July, running in the GTX 1 class; it was qualified in 33rd on the grid of 44. The No 65 car had Kurt Simonsen driving with Lundgardh this time. Here on a wet day they had a good result: 18th overall and 1st in IMSA GTX. It was to be its last race in the period. Following this, money ran out, and it was first stored by the Kremers; then the Lundgardh 935 passed through several hands before being resurrected to run as a restored car, seen at the 2007 Old Timer Grand Prix in Germany.

♦ ♦ ♦ ♦ ♦

Sehcar-Brun-Porsche

Blink and you missed it! The Sehcar disappeared almost as soon as it had arrived. Swiss enthusiast Walter Brun had entered the Sports Prototype arena and acquired a company called GS Tuning (Gerhard Schneider) in 1982 along with a pair of Sauber SCH C6 Sports Prototypes, reputed to have been created by Seger and Hoffman. The car, SH 82-C6-02, ran with a Cosworth engine. At the Silverstone 1000km on 8 May 1983, though it had qualified 12th on the grid of 28

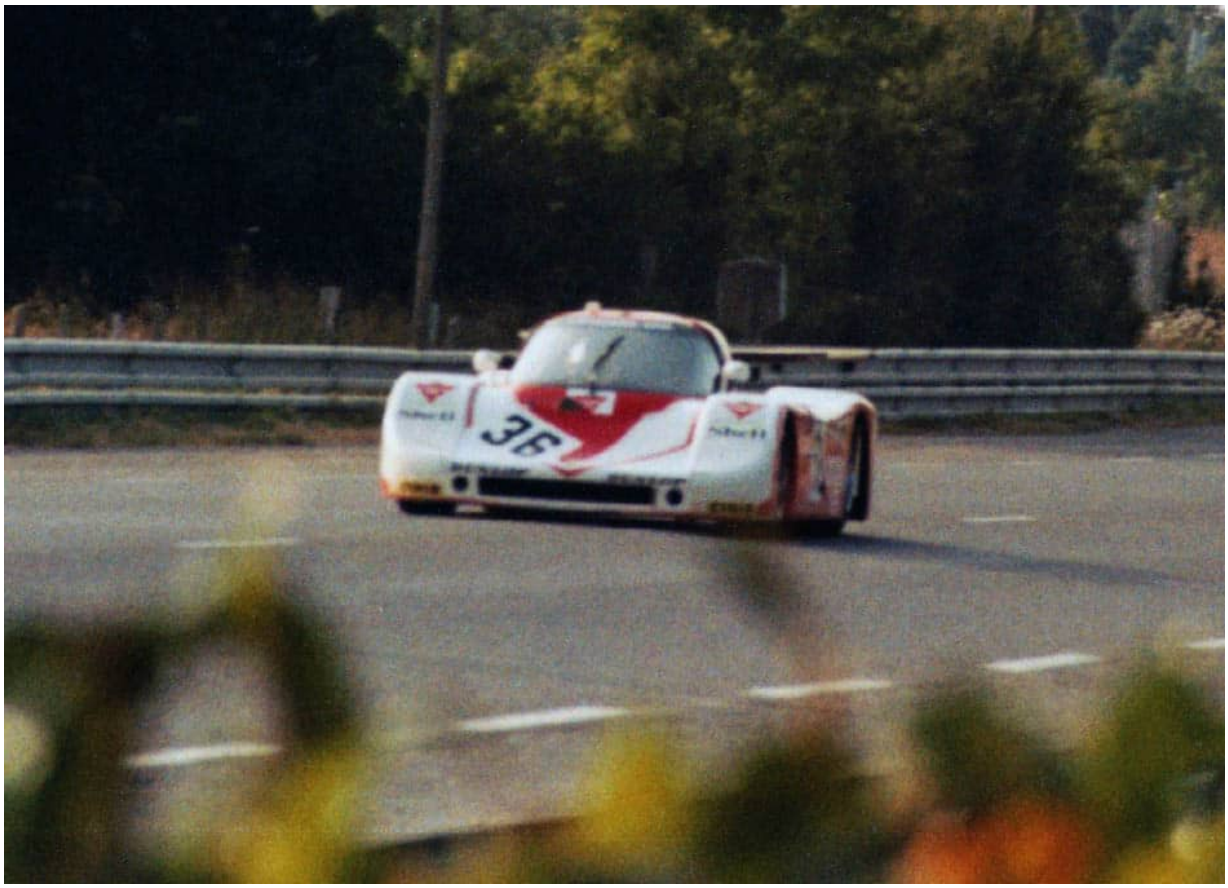
starters, it lasted only to lap 32, when the gearbox failed. Then at the Nürburgring on 29 May, fitted with a BMW unit, it again qualified well up, this time 7th on the grid of 38 starters; so it was quite quick. However, it went out in an accident on lap 19. At Le Mans in 1983, the No 36 SH 82-C6-02 qualified only 40th and went out on lap 68 with overheating problems. At this stage it again had a Ford Cosworth engine.

Walter Brun had earlier decided to acquire a new chassis tub from John Thompson's TC Prototypes in the UK from a project that had folded, involving a Ford C100. A Porsche 2649cc 956 engine was installed and the car was entered for the 1983 Le Mans 24 Hours, called a Sehcar-Porsche C6-03. However, it was a rush job, and preparation was lacking, the car losing a door in the opening laps of practice. Numerous other problems led to a furious Hans Stuck Jr walking out on the Thursday, leaving Walter Brun himself and Harald Grohs to try to sort things out. They didn't, and Brun withdrew the car. Much work was undertaken during the forthcoming months, and for 1984 we see the new car, now called a Sehcar-Porsche C830-02, entered first at Monza for the 1000km on 23 April with Huub Rothengatter/Clemens Schickentanz on board. However, engine failure in practice put paid to their race and they did not start. It was a different story at the 1984 Silverstone 1000km on 13 May. Entered under the name of Procar Automobil, and driven again by Huub Rothengatter/Clemens Schickentanz, the car started from 15th on the grid and finished the race in 15th overall.

The Brun Sehcar-Porsche came out again at the 2 September round of the WEC at Spa, with Didier Theys/Boy Hayje/Pierre Dieudonné down to drive. It sported the new front wing idea (it is thought first instigated by the Richard Lloyd team on its 956). However, the untimed practice saw an engine failure intervene in Walter Brun's plans.

Failing to start at the Spa 1000km, Didier Theys/Boy Hayje/Pierre Dieudonné were left on the sidelines. Determined to try again, Brun entered the Sehcar for the Imola 1000km on 16 September. Again with Didier Theys/Pierre Dieudonné as drivers, it qualified 16th on the grid, but lasted only to lap 99 out of 199 laps, going out after an

accident. It was seen no more. Walter Brun bit the bullet and ordered a factory 962. The rest, as they say, is history, Brun becoming a major player and enjoying considerable success with several TC Prototype Thompson-chassised 962 cars.



Le Mans 1983: another try with the SH-82-C6-02. It qualified 40th but went out on lap 68 with overheating problems in its Cosworth engine. (JS)

The new Thompson-chassised, Seger and Hoffman-bodied Sehcar-Porsche, named the C6-03, was entered for Le Mans in 1983. It never got to start, being ill prepared, and encountering many problems. (FRAJ)

Silverstone 1984: Huub Rothengatter/Clemens Schickentanz. The Sehcar-Porsche C830-02 started from 15th on the grid and finished the race in 15th overall. (PC)

The Sehcar 830C seen here during test days before the 1984 Spa 1000km. Entered with drivers Didier Theys/Boy Hayje/Pierre Dieudonné, it succumbed to engine failure and did not start the race. It is to be noted that it sported a front wing which would become 'fashionable' for a short while. (NV)

Brun-Porsche

The aforementioned Walter Brun, born in 1942 in Lucerne, Switzerland, was to become one of the great characters of late 20th century motorsport. Previous 'great characters' could easily include Nuvolari, Amédée Gordini, Innes Ireland, Sir Stirling Moss – the list can go on, but in a world of extroverts Walter Brun was to turn the term into an art form. As we have seen, the gaming machine and night-club entrepreneur had arrived on the motor racing scene earlier in the 1980s – according to reports from eminent journalists of the time, always with a blonde on each arm! Walter Brun did nothing by halves: here was a full-on high-life specialist. But it is said that whilst he could be explosive, colourful and opinionated, beneath the shiny shop window there was a mind and a determination to do things

perfectly, with little expense spared to provide the right equipment, attract the right drivers and push the envelope of technology. Walter Brun was a shock to the sports car racing world when he arrived, but soon everyone came to respect the man with a mission to be the best and professional to his fingertips. He drove in some 500 races. But it was with his own Brun Motorsport company that he made his mark. As we saw in the preceding item on the Sehcar-Porsche, he acquired the company GS (Gerhard Schneider) Tuning; this was the start of the big time. After buying and running factory cars (he had 962-107 in 1985), Walter began modifying them and then building up Brun cars, acquiring chassis from John Thompson in England, the first being the 001-BM; there would be seven more from 1987 to 1991. 962-001-BM raced 23 times during 1987 and 1988 before it was 'broken' at the IMSA World Challenge at Tampa in November 1988, incurring a dnf. It had eight dnfs, but also one victory at the Österreichring on 31 July 1988. Numerous top-ten finishes proved this was a good car; it was driven by Walter Brun himself on 17 occasions, all the time using Porsche engines.

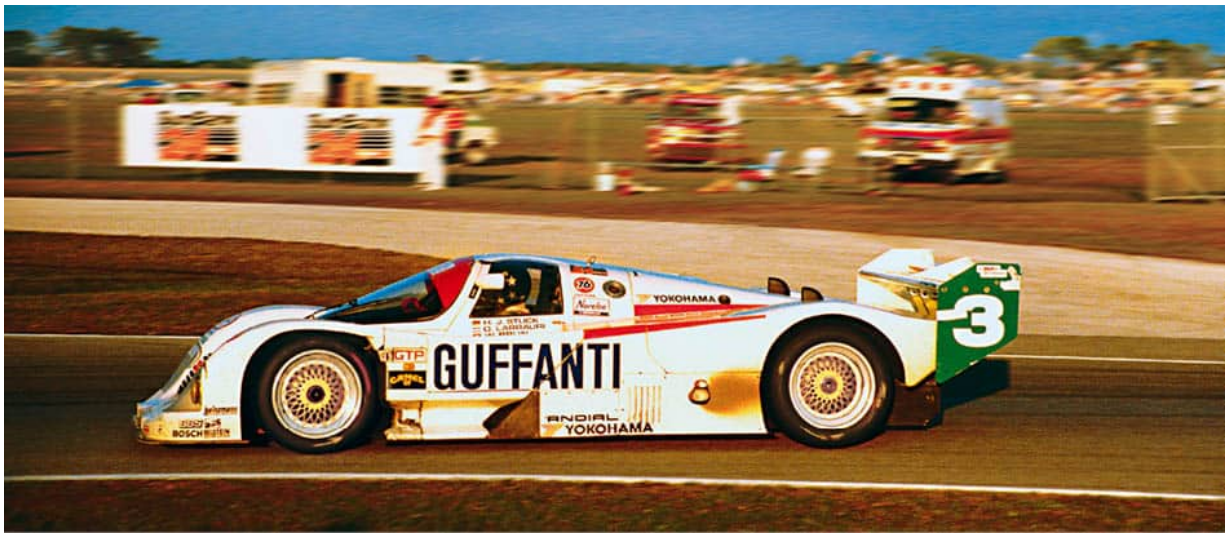
During this period Brun 962s became pretty successful. In 1987 Walter Brun Motorsport finished second to Jaguar in the Sports Car Teams World Championship, even beating Porsche itself. Brun Motorsport came 4th in 1988, and 3rd in 1989.

Supercup Nürburgring, 26 April 1987: the Brun-Thompson chassis 962-001-BM driven by Jochen Mass, 5th on the grid to 3rd overall. (P)

962-002-BM

Also built up in 1987, this car would run on five occasions, with a best result of 3rd at the Spa 1000km, powered by a 2.8-litre engine at that point. Fitted with a 3-litre, it ran a further five times in 1988, with best results being two 4th places at Jarama in March and the Norisring in June.

Jarama 1988: the Thompson-chassised, Brun-built 962. Manuel Reuter/Uwe Schaefer, 4th overall (Monocoque-Thompson 002-BM). (P)



Brun 962-002-BM at Daytona 1989 with a different rear wing to its earlier 1988 pattern: Oscar Larrauri, Hans-Joachim Stuck/Walter Brun, 3rd place overall from 4th on the grid. (P)

962-003-BM

It benefitted from the upgrade of fitting the MP 1.7 electronics package and other modifications such as the air intakes in the chassis sills. In 1988 the car ran on six occasions, with a best placing of 4th. In 1989 it raced on 12 occasions, netting a 2nd place best, along with three top-five finishes, but also five dnfs. It raced twice more in 1990 before being sold to Willy Koenig.

962-004-BM

Achieved two 3rd places during its 1989 life, plus five dnfs and numerous lower places over ten races.

962-005-BM

A joint venture for Brun with the Alpha team in 1989, but had a torrid time, taking only an 8th at Suzuka in 1989. The Suzuka run was followed by a dnf at Le Mans, and later the same occurred at Fuji.

The amazing private team of Walter Brun cars at Le Mans 1989. (L-R) car 5 Akihiko Nakaya/Sarel van der Merwe/Harald Grohs 962-003-BM (Thompson chassis); car 6 Roland Ratzenberger/Walter Lechner/Maurizio Sandro Sala 962-005-BM (Thompson chassis); car 16 Uwe Schäfer/Harald Huysman/Dominique Lacaud (Porsche 128); car 17 Oscar Larrauri/Jesús Pareja/Walter Brun (with child on knee) (Porsche 150); car 27 Franz Konrad/Rudi Seher/Andrés Vilariño (Porsche 117). (P)

962-006-BM

This car ran in the Jägermeister livery from its inaugural race at the Coupe de Dijon in May 1989. That dnf was followed by a victory at an ADAC German Championship round at Diepholz on 6 August. It also raced in Torno and Repsol colours. The car was damaged in an accident on 29 October at the Mexico City World Sports Cars round of the struggling World Championships. It is understood it was later rebuilt in the UK by Chris Crawford in 2000.

962-007-BM

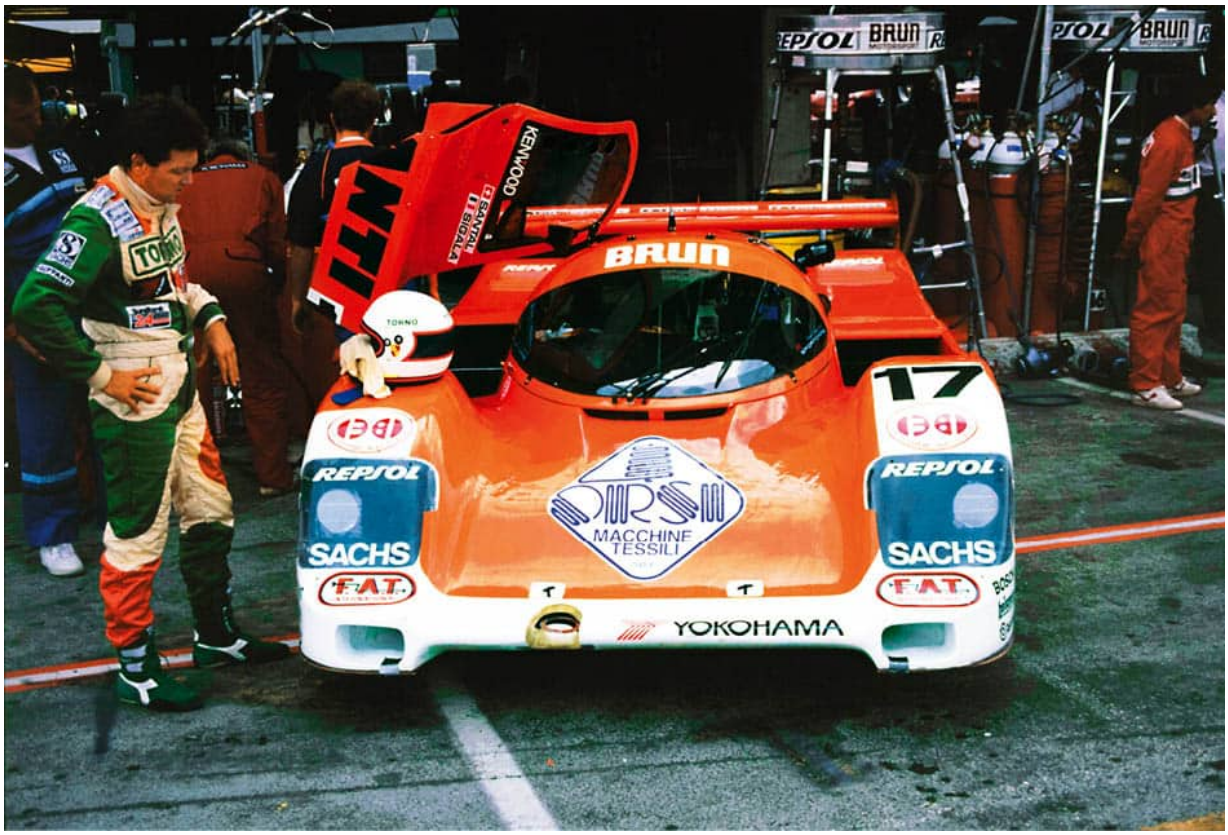
This was the famous Hydro Aluminium-liveried car, before it switched to the Eterna livery. Like the car that follows, the 008, it ran first in 1990, running seven times under the Brun banner and never dnf'd.

962-008-BM

In a period when Walter Brun was experiencing problems, and sponsors changed frequently, this car ran carrying the liveries of Torno, Jägermeister, Colloni and Guffanti. Its best result was an 8th place at Silverstone on 20 May 1990. It raced once more on 14 April 1991 at Suzuka.

One has to remember that the Walter Brun team was a private effort, and it is remarkable that Brun was able to come 2nd at the 1987 Daytona 24 Hours. Brun 962s ran in the USA, Japan and, of course, throughout Europe. Unfortunately, time was to run out on the expansive team boss in 1990 after an abortive attempt to move into Formula 1. Brun is quoted as saying: “Optimism is the foundation of my life.” He took over the failing Euroracing team in 1988, but he had not reckoned on the beast in the jungle, that was the Grand Prix circus. Brun was a man who crossed boundaries – he was even involved in a deal to buy Brabham, but it did not last long. He quickly switched back to sports car racing in an attempt to keep going and recover, but there were other factors at work, viz the F1 team fiasco, and the Brun C91 (Judd-powered) Gr C sports car in 1991, which was not a success. He simply ran out of money. Walter Brun eventually returned to racing for fun from 2000 to 2003, racing in Europe and the USA, but not in cars powered by Porsche.

Bernard Santal/Otto Rensing at the Nürburgring, 19 August 1990, World Sports Car Championship round 6, 962-008-BM, twin-turbo 3-litre,17th on the grid, finished 13th overall. (P)



Walter Brun 962, chassis 008-BM, Mexico City round 9 World Sports Car Championship, 7 October 1990. Unfortunately, this car, due to be driven by Massimo Sigala and Bernard Santal, was a non-starter following an accident in practice. (P)

♦ ♦ ♦ ♦ ♦

Dahmen-Porsche

Heinz-Jörgen Dahmen started racing in 1972, first with a BMW saloon in April, and then a 911S which in August of that year picked up a 2nd place at the Norisring Germany. He also had a victory at the Kassel-Calden round of the German GT Championships, also taking a GT victory at the Zolder round in the October. In 1973, he again won at Zolder in the 911 in the GT class. After a run of less successful results in 1974, in 1975 he was back in the winners' circle twice, with two 2nd places in a 911 RSR Porsche, again in the GT class, in 1975 being sponsored by Kannacher Porsche in Krefeld. He missed out 1976/77, but returned in 1978/79 in a BMW L4. A not very fruitful

year saw him out in a 935 into the 1980s.

The Dahmen DC884-001 was created in 1984. The basis of this, the author was unable to establish, but it was fitted with the inevitable Porsche flat-six 935 single-turbo engine, maybe from the previous 935. The DC884-001 ran at the DRM Nürburgring Sprint in September 1984, finishing 9th overall. In 1985, it came out again and raced in three Interserie rounds at Most (Czechoslovakia), the Nürburgring in 1985 and again at Most in 1986. At the Nürburgring it is recorded that the car finished 9th, but it was dnfs at the other races. It appears DC884-001 had its final race at the Seigerland Interserie round on 23 August 1987. The next we see of Heinz-Jörgen Dahmen is at the Norisring Supercup meeting on 26 June 1988, in a Dahmen-entered 962 chassis 009-88D (formerly the 962-112 of the John Fitzpatrick and Dauer race teams). There is an interesting little story with this car – a story that is, in fact, not uncommon in racing. This 962 had started life as a factory-made 956-102. After numerous replacement parts, which included a large number of parts from the remains of 956-102 which crashed in a huge accident at Silverstone, when Manuel López had left the pits in a hurry on cold tyres and crashed into the trackside barriers. The recycled parts reappeared in a new tub as Porsche 962-112. (The leftover chassis from Porsche 956-102 was sold to Siggi Brun in 1988 and subsequently rebuilt.) The much-used car had been obtained by John Fitzpatrick in 1985; it endured a big crash in practice for the 1985 Le Mans 24 Hours (Author: maybe a jinxed car!). It is thought it went to Bob Sparshott in the UK to be repaired. The chassis tub received a honeycomb front and top panel plus the spine between the seats. In the spring of 1986 at Silverstone, Fitzpatrick, who was contemplating retirement, had an offer from Jochen Dauer for the team, cars and equipment. A deal was done and it included the 112, still running under the Fitzpatrick title at Le Mans. It finished in 10th place at Le Mans in 1986, entered at No 55. Jochen Dauer Racing then collected the whole Fitzpatrick team equipment – cars, spares, truck, the lot. Dauer then ran 112 with ‘Victor’ sponsorship throughout 1987 until Kyalami in November. Some while later, it was sold to Heinz-Jürgen Dahmen, who ran the car in 1988 and 1989 but with the new chassis number 009-88D (9

because it is said this car was Dahmen's 9th race car, and 88 because it was in 1988, but also due to a deal concerning Dauer, who had decided at the time to use the chassis number 112 elsewhere. (The reader might like to check out 962-133 Dauer.)

The Dahmen DC884-001 that first ran in 1984, powered by the 935/76 Turbo: 9th overall at the Nürburgring Supersprint 23 September 1984 with Heinz-Jörgen Dahmen at the wheel. (NV)

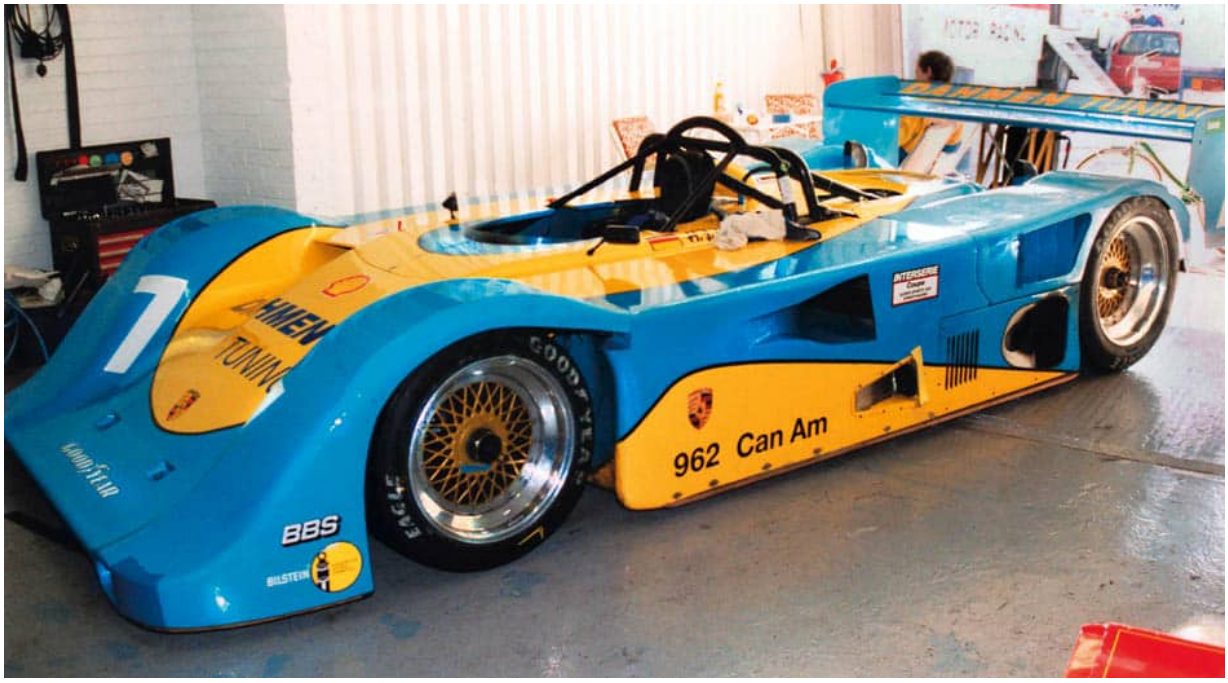
Norisring Supercup meeting on 26 June 1988: the Dahmen-entered 962 chassis 009-88D. This car was the former Fitzpatrick/Dauer 962-112, and was built up by Dahmen utilising Kremer bodywork. (P)

Heinz-Jörgen Dahmen 962-910 in the new, reputedly TC Prototypes-chassised car with Kremer bodywork, ran at Brands Hatch and here at Seigerland during 1990. He would go on to take 5th overall at Zeltweg in October. (P)

Mediocre results demean the obvious enthusiasm of Heinz-Jörgen Dahmen, as can be seen in the numerous races that he attended. It was in July 1990 at Zeltweg that Dahmen appeared in a fresh 962, listed in records as chassis 910, a new chassis from John Thompson in the UK. Dahmen made 14th on the grid, but dnf'd in both heats of this Interserie round. A week later at Brands Hatch, he was 8th on the grid and finished 7th in heat 1 and 5th in heat 2, with his overall result quoted as 5th.

On 12 August it was 5th overall again at the Interserie Most round. At Seigerland it was a dnf, but at Zeltweg on 14 October he came 5th overall. Dahmen raced the car through 1991 with little further success. He then decided to acquire another chassis from TC Prototypes in Northampton in the UK; this would be called 962-911, and was an open-chassised car listed as a CanAm 962-911 in 1992. The author was informed by Trevor Crisp of Katana that the chassis, made by John Thompson (TC Prototypes) was an open car from the start. It was said to have a four-cam 3-litre turbo engine. The next time we see it is in 1995; the Heinz-Jörgen Dahmen is listed as being

raced by him in the Interserie races through 1995 and 1996.



The new 962 CanAm Thompson-chassised car of Heinz-Jürgen Dahmen. (JS)

8 October 1995: Donington Interserie round 5. The 962-911 would finish 4th overall. (JS)

A whole new car, not a conversion. The 962-911 chassis was made by TC Prototypes as an open car from the start, to the Interserie CanAm regulations. (JS)

♦ ♦ ♦ ♦ ♦

Richard Lloyd Racing (GTi Engineering)-Porsche

Legendary designer Peter Stevens worked in the 1980s with the late Richard Lloyd (Lloyd sadly died on 30 March 2008, in a plane crash which also took the life of racing driver David Leslie). Peter Stevens told the author: “Richard Lloyd was a racer and entrepreneur, from owning a Chinese restaurant to talent spotter for Decca Records (he was there when the Decca management decided that the Beatles would never have a future!). He had some small private means, nothing extravagant, and not really enough to go racing. He acquired a Volkswagen Golf, but didn’t have any sponsorship, so I did the graphics on it for free. We presented it really tidily, and Richard went to VW with an idea for adverts and sponsorship. VW took to the idea – they loved that it said Golf on it; they did some advertising: ‘If you like playing Golf on Sunday, then go racing with the Volkswagen Golf,’ etc. It worked and they provided some sponsorship; this allowed us to get some tweaks done and do some serious racing. We had some thoroughly good fun, but no real money; we only had one set of tyres for racing, so I’d brought a wire brush so we could scrub them clean after each run! At one race in Denmark (amusingly called The Danish Grand Prix!), we easily won each of the three heats that qualified for the final, and the local VW dealer said: ‘If you could make the final look a bit more like a race, there’s five grand in it.’ So Richard let the three people ahead stay ahead while he stayed in close touch; when he made his move, they in turn made it very difficult to pass. It was looking dodgy for us, but on the last lap Richard got by and won, and we got the five grand as well! From then on, he named the team ‘GTi Engineering.’”

The No 14 car, possibly during a practice stop for fuel and tyres in the pit: a casual scene; no rush here! The Canon GTi 956-106 would go on to take outright overall victory at the 1984 Brands Hatch 1000km. This car had the original factory chassis tub. (P)

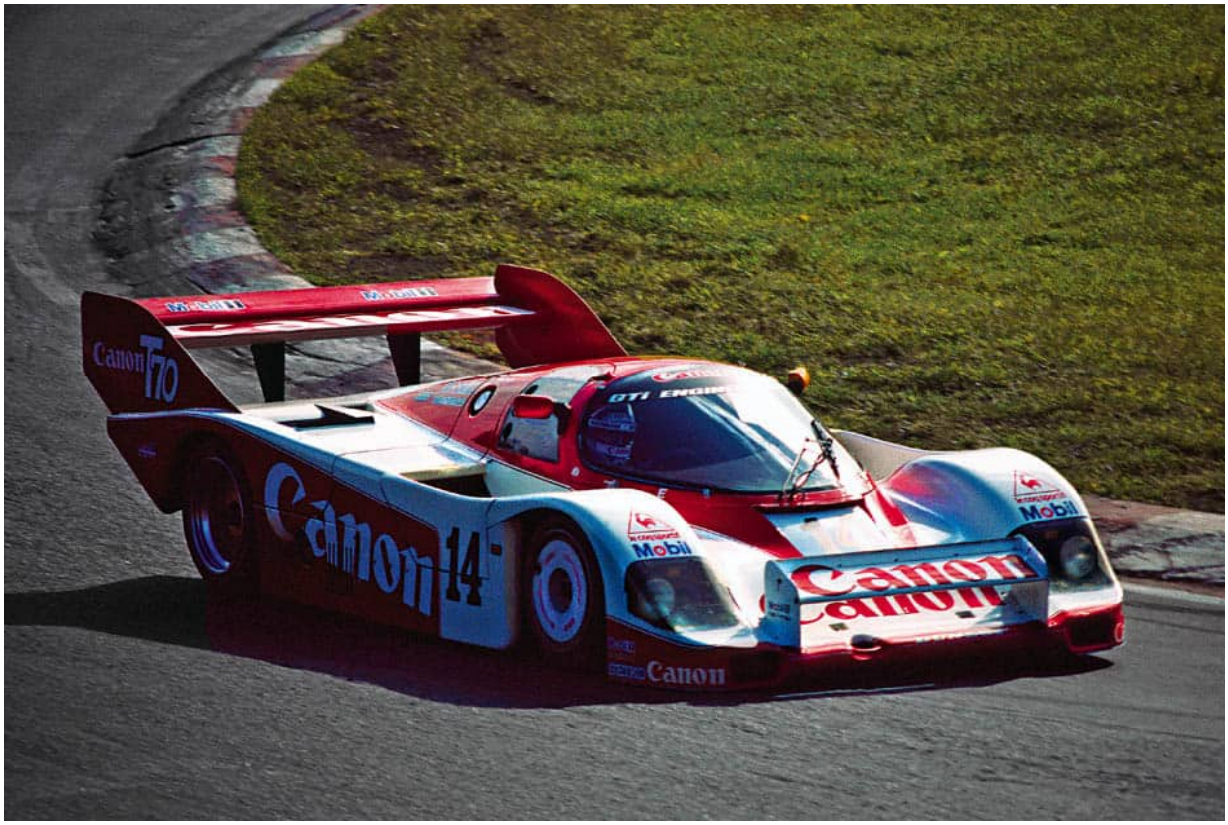
In 1981, GTi Engineering acquired one of the 924 Carrera GTRs on offer from Porsche. This was a Porsche factory-supplied car, and developed by Richard Lloyd's team, racing successfully in the hands of several drivers, including Richard himself, Tony Dron, Jan Lammers, Jonathan Palmer, and Andy Rouse. The car raced in the USA and was eventually sold there in 1983. With sponsorship from Canon Cameras, headed up by marketing guru Mick de Haas, GTi Engineering rose to become a highly respected company and a competent race team. In 1983 Richard Lloyd acquired one of the first customer 956s, chassis 106, which again attracted Canon sponsorship. Designer Nigel Stroud joined the team in August 1983, and commenced the design and creation of an entirely new chassis to take the 956 engine. The new chassis would be the first of two aluminium honeycomb tubs; the author was reliably informed that

these are believed to be the first 956 Sport Prototype chassis to be created with honeycomb sandwich construction.

Two 956 chassis were created by Richard Lloyd's GTi Engineering featuring honeycomb aluminium construction. (Author's note: it was thought there was originally only one, but those who were there at the time say no, it was two.) During this 956 period, development work on the aerodynamics, including diffusers and two-piece carbon-fibre rear wings and a front wing, was carried forward by the team at Richard Lloyd Racing with guidance from Stevens.

The 956-106 original chassis underwent a lot of development, to a point where it won outright the 1984 Brands Hatch 1000km on 19 July 1984. It was also on pole. Seven 956s and one 962 were in this race, finishing in the top nine places: only a Lancia LC2-84 got in the mix in 7th place. The Jan Lammers/Jonathan Palmer winning car had a two-lap margin at the end; perhaps that new front wing had been a proving point!

16th September 1984, the new 956-106B (GTi Engineering tub) at Imola for the world championship round 8 of the WEC. A 6th place on the grid was converted to a podium 2nd overall for Jan Lammers and Jonathan Palmer. (P)



Fuji, 30 September 1984, the 956-106B. Richard Lloyd was one of the first to try a front wing installation to the bodywork above the nose, a controversial idea which never convinced Norbert Singer of its effectiveness, though it was copied by several teams running private 956s. Holbert Racing followed a few months later, fitting one on their 962 in the USA. (P)

The new Nigel Stroud-influenced honeycomb-chassised 956-106B, 1984 Sandown (Australia) 1000km: Jan Lammers/Jonathan Palmer, 3rd overall from 6th on grid. (P)

Peter Stevens told the author: “There were a lot of changes in the team over the years, not only in the cars: we had several team managers – David Price, Keith Greene, Ian Dawson, John Brittan.” All of them were at some time or another involved with other teams, so were experienced. Peter Stevens again: “We did lots of modifications to the 956, some of which we carried over to the 962. Keith Greene and I designed/developed and had altered the aluminium undertray for the nose section of 956-106 for the Nürburgring WEC race in 1983. We altered the leading edge to cope with a tendency that we found on the 956, that was then called ‘porpoising’ on the straights; this was when the front downforce was so great that it pulled the nose down so much that eventually the air under the car stalled, downforce was lost and the nose rose up, only to be pulled down again. We needed to pull the nose down without causing the air to

stall; we did this without changing the dimensions by, as stated, reshaping the underside of the nose. It may seem strange to think we had to alter a car that was so successful, but we were up against other private teams, and whilst Porsche had things under control design-wise, there is always someone who will come up with an idea that's not been tried before. Sometimes we were that team."

As we see, GTi Engineering used the front-wing idea, and the author was told of other changes such as cooling the engine. Where on the factory car the air that was blown over the cylinder barrels was expelled through slots in the aluminium undertray, GTi did things differently. Peter Stevens says: "The original way very much reduced overall downforce, so we expelled that air out through the open rear of the body, encouraged by a small Gurney flap (after Dan Gurney, Eagle F1) at the rear of the tail upper surface at hot races. We found, too, that an uncluttered 'clean' carbon-fibre undertray produced a greater low-pressure area behind the car, which pulled more hot air out of the engine bay. But we had no wind tunnel, so had to test on the track. It seemed to work okay. We soon found many of our ideas being copied by other teams, but that's not unusual. We also switched to a two-piece composite rear wing instead of the factory one-piece. Later on we tried different end-plate configurations, too. Carbon fibre at that time was still a new material and very expensive, so we did not want to use it, other than for certain components – it was unknown territory and our budget was limited. We took to using a pull-rod front suspension instead of the standard Porsche suspension, as this let us develop rising rate geometry for our car. We never told Porsche then what we were doing; sometimes they were not best pleased, especially if we came up with something that they hadn't thought of. We certainly found that the 956-106B was a big improvement over the original car." Key team player Keith Greene told the author: "That's right; the Nigel Stroud-redesigned tub of the 956 was much improved over the original one (stronger and more responsive to set-up changes). We used this tub on 956/106B, until Jonathan Palmer had his big shunt at the Spa 1000km in 1985. We used various engines, too, in 956/106B during this time."

To give the reader an idea, here is the list from Keith's notebooks:

Silverstone test:	10/4/84	956/engine 124
Monza:	20/4/84	956/engine 123
Silverstone:	1/5/84	956/engine 124
Le Mans practice:	13/6/84	956/engine 124
Le Mans race:	16/6/84	956/engine 117 – Fresh Porsche factory rebuild.
Silverstone test:	26/6/84	956/engine 124
Nürburgring:	1/7/84	956/engine 124

Brands Hatch:	27/7/84	956/engine 118
Silverstone test:	8/8/84	956/engine 118 refreshed
Spa:	2/9/84	956/engine 118
Donington test:	5/9/84	956/engine 118
Imola:	14/9/84	956/engine 118
Imola Race:	15/9/84	956/engine 124 refreshed
Fuji:	29/9/84	956/engine 124
Sandown (Aus):	30/11/84	956/engine 124

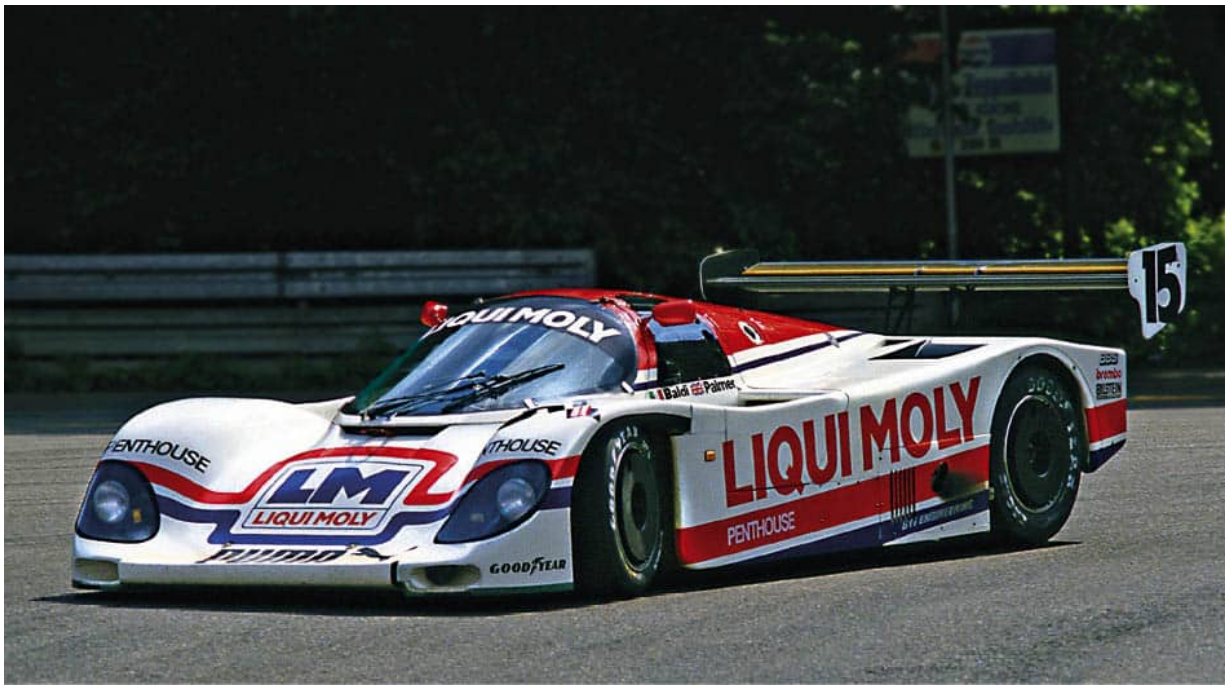
In 1985 we used the following engines: 956/127, 124 (85 spec), 134 (85 spec), 008 (85 spec).

1986: new specs: 127, 124. (says Keith Green.)

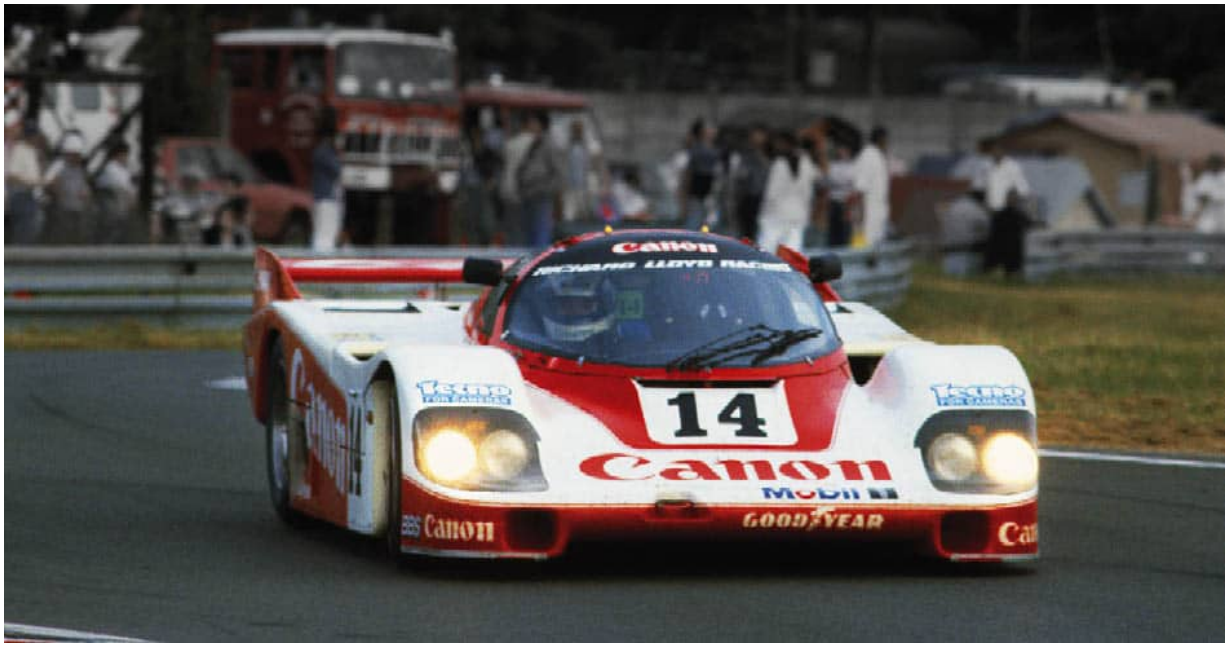
Richard Lloyd Racing's GTi Engineering would go on to create and develop four new 962C GTi, with aluminium honeycomb rather than plain sheet tubs. An insider from Porsche told the author: "At the time we were not satisfied that this material offered an advantage, and did

not pursue it for the 956." But Porsche did eventually go honeycomb in 1986, before ceasing internal production with chassis number 152.

As we have seen, Lloyd had fitted a front wing to the bodywork above the nose. This also proved to be a controversial idea, and one which never convinced Norbert Singer of its effectiveness, though it was copied by several teams later running private 962s: Holbert would use this idea in the USA on his 962s in the summer of 1984, as would several other American teams. Because of extensive use of the parts from the original 106 chassis, GTi Engineering had called the revised 956 the 106B. Its design modifications and greater downforce made it one of the fastest 956s of all, though some failures came due to the increased downforce exerting greater stresses on other components.



The new 962-106B, here taking victory at the Norisring 200 Miles, 28 June 1987 with Mauro Baldi at the wheel en route to a victory for the Liqui Moly Richard Lloyd GTi Engineering team. It was later bought by the Nisseki Trust team and run in the Japan Sports Prototype Championship. (P)



Le Mans 1985: the 956-106B honeycomb monocoque RLR GTi Engineering. Richard Lloyd/Jonathan Palmer/James Weaver qualified 9th on the grid and came home 2nd overall, three laps behind winners Klaus Ludwig/Paolo Barilla/Louis Krages in the Joest 956B. (P)

After finishing 2nd at the 1985 Le Mans 24 Hours, Jonathan Palmer was to have the aforementioned bad accident at Spa. The written-off chassis was replaced by a new chassis. The first of the 962C chassis types, a honeycomb one, was also numbered 106B for the 1986 season. Also, a change of sponsor saw Liqui Moly come on board for 1986 and 1987.

Peter Stevens continues: “After Jonathan Palmer’s big off at Spa in 1985, at the time a lot of teams were switching to the 962 through 1986, but we decided not to buy a customer 962 for 1987; we built our own, calling it, as already mentioned, the 962-106B. This time we used the MIRA rolling road 1:5 scale model wind tunnel.”

Nigel Stroud and Peter Stevens oversaw all the aero tests, Peter being tasked with building the scale models at the Dove Company in Norfolk. Peter Stevens: “We needed to keep the cost down, but at the same time build our own unique car. Richard had secured sponsorship from Liqui Moly. We found, too, with the new design,

when we eventually got to do wind tunnel tests, there was a big gain in overall downforce with only a very small increase in drag, and less pitch sensitivity by using the rear wheel covers."

The 962-106B would have an interesting life:

22/3/87	Jarama 360km	8th – Mauro Baldi/Jonathan Palmer
29/3/87	Jeréz 1000km	dnf gear box failure – same drivers as Jarama
12/4/87	Monza 1000km	dnf wing failure – Baldi was joined by Giacomelli
10/5/87	Silverstone	dnf engine – Mauro Baldi/Jonathan Palmer
14/6/87	Le Mans	car caught fire on lap 112 – dnf for Palmer/James Weaver/Price Cobb
28/6/87	Norisring	Mauro Baldi took victory in the Nürnberg 200 Miles
26/7/87	Brands Hatch 1000km	2nd Baldi with Johnny Dumfries
30/8/87	Nürburgring 1000km	5th overall – Baldi/Palmer took pole position
13/9/87	Spa 1000km	dnf (transmission), front row start, 2nd on grid
27/9/87	Fuji, Japan, 1000km	3rd Baldi/Mike Thackwell

962-106B at Le Mans 1987; it caught fire on lap 112 on the Mulsanne, during the night at 23.40h. Dnf for Palmer/James Weaver/Price Cobb. (P)

At the Kyalami 500km on 11 November 1987 it was painted in Rothmans colours, and raced by Jochen Mass to overall victory in a two-heat race. The 962-106B then went to the Trust Racing Team in Japan, where it raced throughout 1988, taking three pole positions in the hands of Vern Schuppan. It was to stay in Japan, racing through 1990-1991.

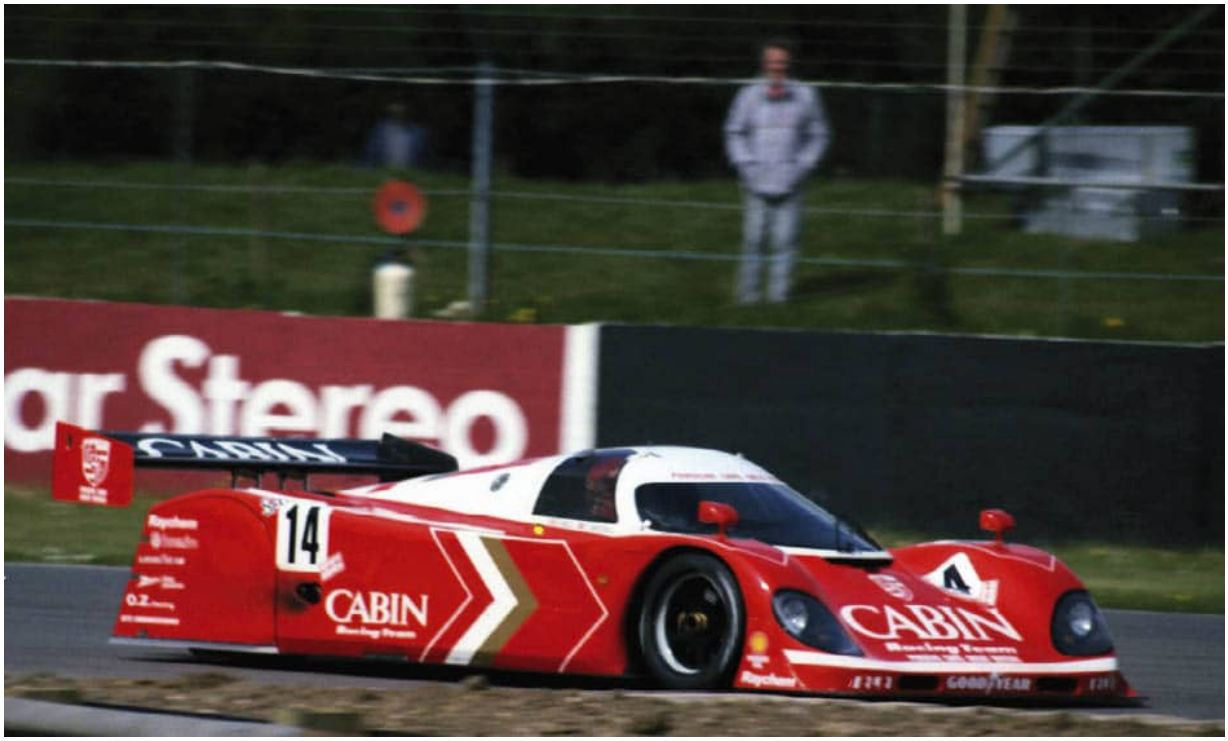
RLR 962 C200

The RLR GTi 962 C200 had a quite useful career. First appearing in 1988, it ran in six races in 1988, picking up a 3rd, 4th and 7th. In 1989 it raced on nine occasions and collected a 2nd, 4th, 5th, 11th, 15th, and 19th. It raced on through 1990 with the 3-litre engine fitted, but only collected a 15th overall at Suzuka, its two other appearances

yielding dnfs.

A bizarre sponsorless livery greeted spectators in the opening practice at the Jarama 360km, 13 March 1988, but the car wasn't seen in the race after an accident in practice rendered it hors de combat. (JS)

The Richard Lloyd GTi 962C 200, Silverstone 1000km, 8 May 1988: Derek Bell/Tiff Needell. “The car was disqualified due to an oversize fuel tank,” says a former team member. (P)



Richard Lloyd Racing 962 GTi 200 RLR at Silverstone on 14 May 1989: 2nd overall in the Interserie Supercup round. (RS)

Chassis 200 ran at the Le Mans 24 Hours in 1989 with Derek Bell/Tiff Needell/James Weaver. It would suffer from a fire after 339 laps of racing, just before 14.00h on the Sunday; Tiff Needell escaped unharmed. (P)

962C RLR 201

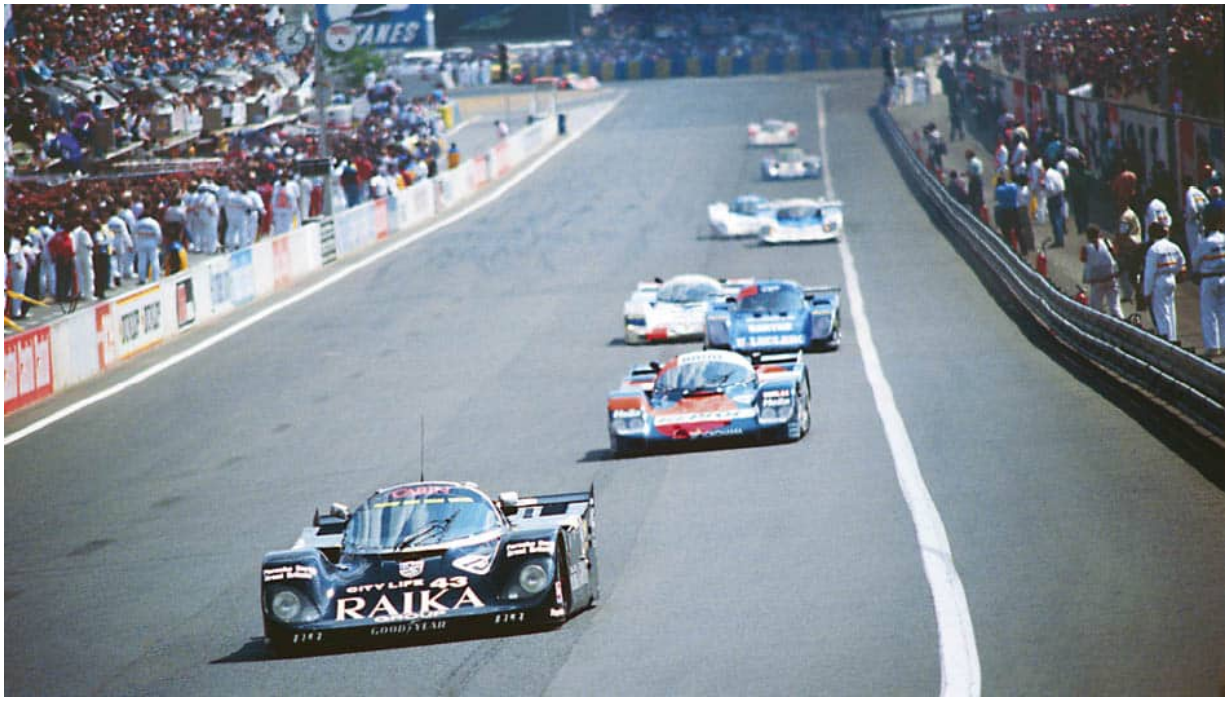
As Peter Stevens says: “Front end improvements were continued into 1988 with the construction of another car, chassis No 201. The central gap on the bottom of the nose was filled in, allowing for the relocation of the brake cooling ducts towards the centre of the car, while an extended splitter was added to aid front downforce. Chassis No 201 joined the team in 1989, identical to the other team car. The new car initially retained the rear wheel covers that No 200 had used for improved aerodynamic performance, but they were later removed in 1990. The brake cooling ducts were also moved into larger openings higher on the nose.”

The 201 enjoyed a useful life, though the opening races were not so hot. At Le Mans in June 1989 it was dnf when the engine failed, causing a fire on the 228-lap mark. Then at the Brands Hatch Trophy meeting on 23 July an accident caused another dnf. However, the car did come home 11th overall on 20 August at the Nürburgring, driven

by Steven Andskar/Bertrand Gachot. At Spa on 17 September, Tiff Needell/Steven Andskar were 10th on the grid, but, unfortunately, they lasted only 15 laps before the engine failed. In 1990, chassis 201 was 17th overall on 29 April at the Monza 480km with Manuel Reuter/Luis Pérez-Sala/James Weaver, sponsored by Italya Sports on this occasion. After this the 201 raced on seven more occasions, netting a best of a 3rd, a 6th and two 11th places overall.

The 201 used as a practice car at the Donington WSPC round. A reference in Time and Two Seats states the 201 was not used in the race: the 200 replaced it to race to 11th overall. (JS)

17 September 1989, Spa: the 962C RLR 201 for Tiff Needell/Steven Andskar. 10th on the grid, unfortunately it lasted only 15 laps before the engine failed. (P)

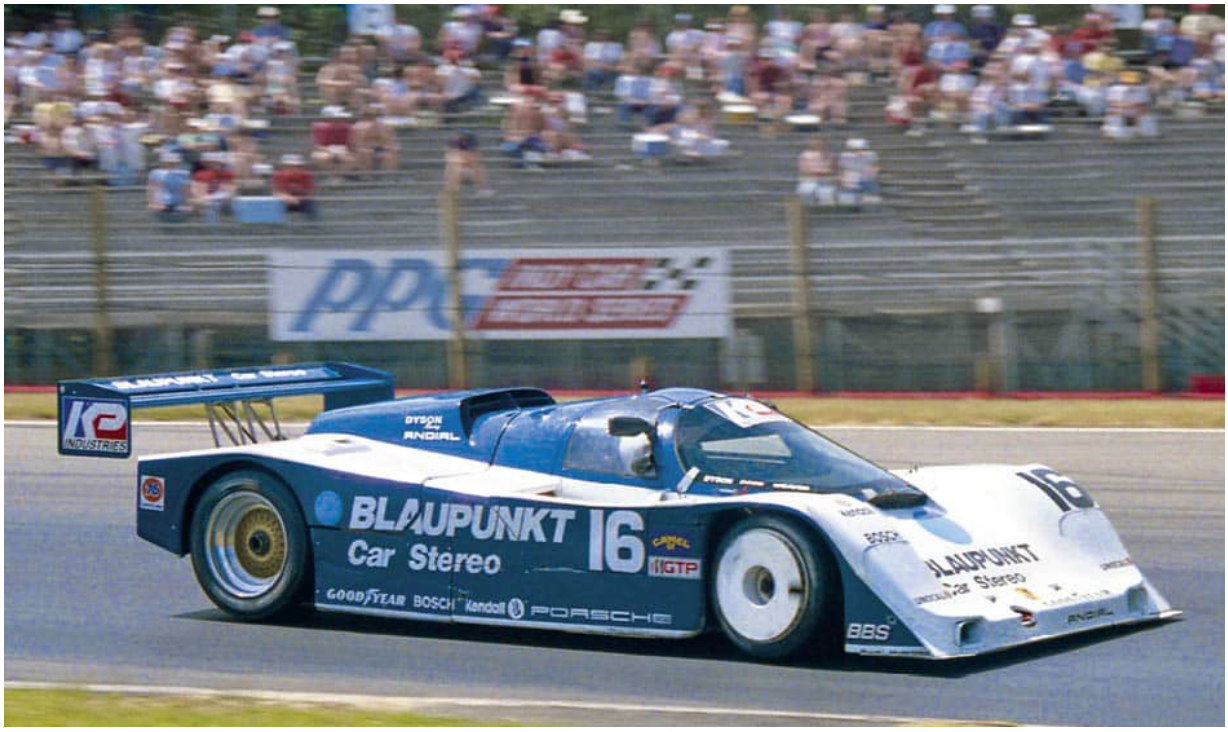


1989: RLR 201, No 15 (the lead car in this image) – a young Damon Hill, no less (son of the late Graham Hill). He was joined by Swede Steven Andskar and Brit David Hobbs in the Raika-sponsored Richard Lloyd-entered car at the Le Mans 24 Hours, not a success unfortunately. Hill at the wheel felt the engine let go on lap 228 at 06-43h on Sunday. (P)

The RLR 201 of Richard Lloyd Racing, now with water-cooled inter-coolers and the 3.0-litre Porsche engine with a Bosch 1.7 Motronic, as it ran in 1990 having attracted Italya Sports sponsorship, seen here at the Silverstone British Empire Trophy race (11th overall). At Le Mans it would be driven by Manuel Reuter/James Weaver/JJ Lehto (dnf). It finished 3rd at Montreal on 23 September 1990 in the hands of Manuel Reuter/Steven Andskar. (JS)

962C RLR 202

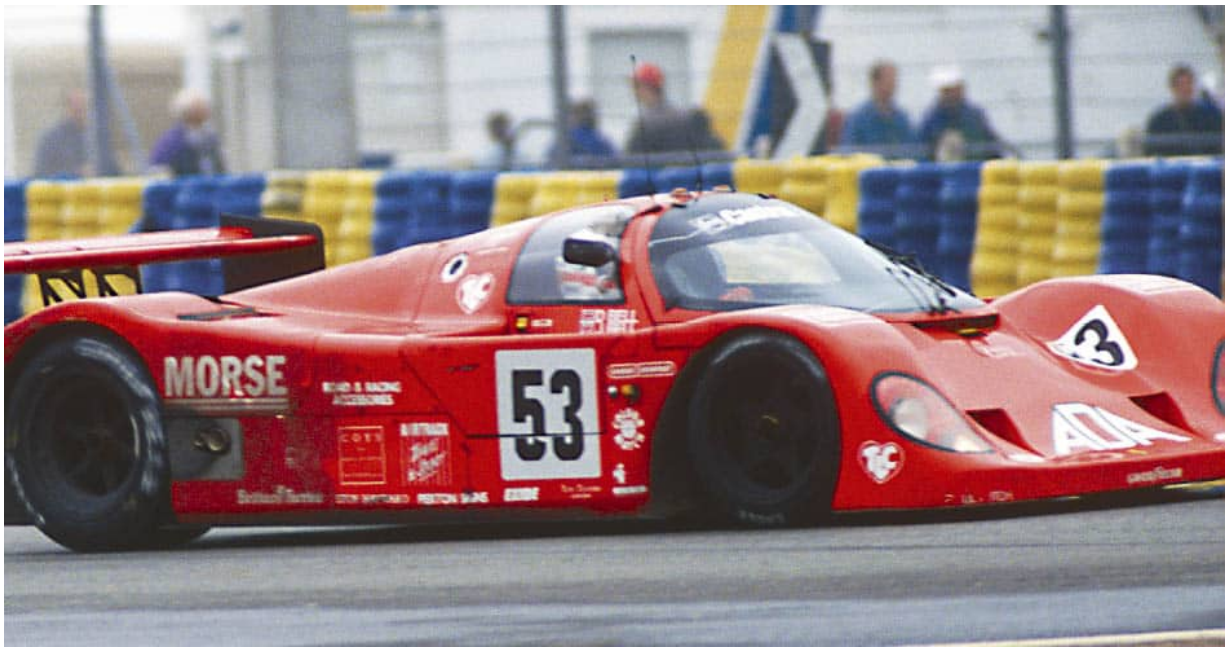
Supplied to Dyson Racing USA to become the DR1, this car was created during the latter part of 1987/early1988 (Dyson had a factory 962 in June 1986.) The RLR 202 was supplied direct to Dyson Racing (refer to the section on Dyson-Porsche for more details).



RLR 202 was built from scratch as an IMSA car, and would go directly to Dyson Racing in the USA at the beginning of 1988. Here we see the car at Mid Ohio, 5 June (see the item on Dyson-Porsche). In standard form, but with the over-engine turbo and intercooler installation, typical of the US 962s of the period (see also Holbert-Porsche). (MW)

962C RLR 203

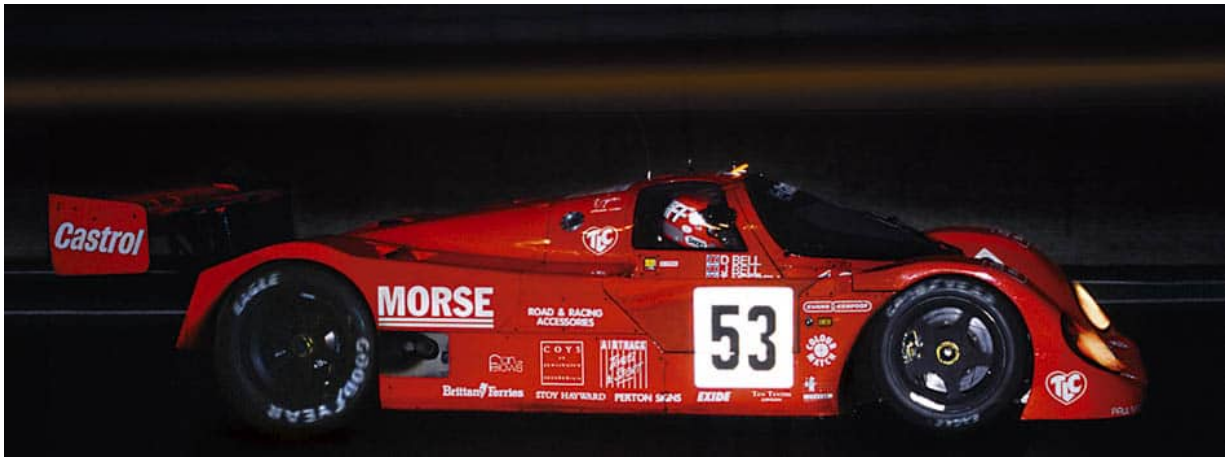
In 1992 ADA Engineering would acquire the Richard Lloyd GTi Engineering company, and the team would be run as ADA from then on. The RLR 203 was built at ADA in spring 1992 from an unused new RLR tub, according to a former ADA team member.



ADA had taken over the RLR team and the cars; here, the GTi 962 -203 (some sources say 202, however, a reliable source – one of the men who built the car – says definitely 203: 202 was always an IMSA car). It was built at ADA from a spare RLR tub. Seen here on its way to 12th overall at Le Mans 1992. (P)

The former Le Mans 1992 car. Seen here in practice en route to a grid place of 13th at Le Mans. (PK)

The ADA Engineering 962 at Le Mans 1994 for Team Nippon (Japan) for Jun Harada/Tomiko Yoshikowa/Masahiko Kondou; they started 13th on the grid but were not classified, with only 185 laps completed, the head gasket being the culprit – it let go at 09.50h on the Sunday. (PK)



Le Mans, night-time: the now ADA 962-203 RLR, 21-22 June 1992, driven by Derek Bell/Justin Bell/Tiff Needell; after this race the car would appear in new livery. (P)

The 962 Richard Lloyd Racing GTi Engineering 962s:

962 GTi	106B	Made in 1984
962 GTi	100	Made in 1987
962 GTi	200	Made in 1989
962 GTi	201	Made in 1989
962 GTi	202	Built as an IMSA car this became the Dyson DR1
962 GTi	203	Built at ADA spring 92 from an unused new RLR tub + spares bought at an auction. The car ran with bodywork mods required for the new regs at LM94. Interestingly it was taken to Ireland and established a new Irish land speed record and after that it was bought by a customer in Germany who converted it for road use!
962 GTi	*204 and 205*	*Although listed in some records, were never built. The cars did not exist.*

The ADA RLR 203, seen here in Ireland in preparation for the Irish land speed record attempt! (TC)

♦ ♦ ♦ ♦ ♦

Joest-Porsche – Part 1

Reinhold Joest came to motorsport out of a passion for racing cars. It is said he acquired his first car as a young man, without telling anyone in his family! They found out a couple of months later, it seems, and his father demanded to see what it was – luckily he was okay about it. The car young Reinhold had bought was a Porsche Speedster, which was to be used for hillclimbing. In 1962 he was working as a mechanic for a VW and Porsche dealer. With some success under his belt as an amateur racer in several National racing series, he decided to go professional racing in 1969. He drove a GT40 for a team sponsored by a German magazine, *Deutsche Auto Zeitung*, and entered by Hans G Lehmann; his co-driver was Helmut Kelleners. The pairing began at Brands Hatch, but it wasn't to be an auspicious debut in the professional ranks. However, at the Monza 1000km of 1969, they were 4th overall, and winners of the Sports 5-litre class. At the beginning of June they repeated the class win at the

Nürburgring, then came 6th overall at the 1969 Le Mans 24 Hours.

Reinhold Joest was on his way, but he had a setback in 1970 when, having signed to drive for Porsche, he had a serious road crash, enough to put him out of the driver reckoning. 1971, though, saw Joest in a 917 along with Willy Kauhsen taking a 6th place at the Brands Hatch 1000km, 7th at Monza and 4th at Spa. Porsche had not deserted him, and he ran in the 'Pink Pig' Hans Dieter Dechent 917/20 at that year's Le Mans.

In 1972, Le Mans saw a 908 long-tail, entered under the name of Reinhold Joest, finish 3rd on the podium. Through the rest of 1972 he ran a Porsche 908/03 short-tail, winning at Interlagos and regularly finishing in the top ten.

Through 1973 he continued to make his presence felt, winning at Kyalami at the end of the season. It would be a similar story of top results through the remainder of the 1970s.

He had been running his own cars since the early 1970s, as well as driving those and the factory entries. He rounded off his driving career with a victory at the 1981 Kyalami 9 Hour race, whereupon Reinhold Joest retired from full-time driving.

Daytona 1980: victory for the 930/935 (930 890 0014) Joest car, driven by Joest himself along with Rolf Stommelen/Volker Merl. (MS)

Business is what would occupy his mind right through to the present day, first of all running Porsches, and then becoming a legend with the Audi Le Mans cars. Joest Racing had also been running cars for others, beginning in 1978. In 1979 he arrived at the world's race tracks with the 935J (Joest): Porsche chassis 930 890 0014, built in 1978, but somewhat remodelled by Joest to become the 930/935J, first of all running in the German National series. Then, in 1980, he was to run Joest 930/935J at the Daytona 24 Hours, where it won.

The Joest team would run several 935s themselves and also supply cars to others, working closely with Porsche as a customer for parts and engines in a similar way to that of the Kremer brothers. Many teams like Joest would modify – and some change extensively – the cars that arrived from the works.

The 935.81 JR001

Joest Racing acquired and extensively modified a 935/78 factory car in 1981. The car was reconstructed following the general instructions

of Porsche for the so-called ‘Moby Dick’-style bodywork, and adding the twin turbo engine 930/79 into the car.

Porsche was not in a position to sell the 3.2-litre four-valve-per-cylinder engine with water cooled cylinders to all comers, but could to special customers. The name ‘Moby Dick’ had come from the nickname suggested by the German magazine *Auto Motor und Sport*, which said that the new super-low, super-long car in its first guise with a low wing looked like a great white shark, but when the whale-tail shape and high wing were installed, the factory boys said it was the ‘Moby Dick’, after the name of the giant white whale in the story by Herman Melville. Porsche had built two factory cars, but only one saw service, racing at the Silverstone 6 Hours in 1978 where it set pole, over 1 second clear of the 935-77A of George Loos and 2 seconds clear of the 3rd on the grid, the Kremer 935-77A. The ‘Moby Dick’ was a sensation.

Unlike most of the Porsche race cars, the so-called ‘Moby Dick’ was a right-hand drive car, like the 935-K4 of Bob Wollek who drove that car for the Kremer team. (P)

At the Silverstone 1000km, 1978: for the factory-entered 'Moby Dick' it was victory by seven laps, 2 seconds a lap faster than almost any other car. 845 bhp, a serious racer. Seen here at the Nürnberg 200km 1978. It would soon be withdrawn from racing under pressure from the management to concentrate on more pressing projects. (P)

Jochen Mass would qualify 4th on the grid and finish 3rd overall in the Joest version of the 935 81 'Moby Dick' at the DRM Zolder race meeting on 22 March 1981. (P)

The JR 001 935/81 at the Norisring 200, 28 June 1981. It would be a 2nd place in the Division 1 race with Gianpiero Moretti at the wheel. (P)

In 1981, Joest had commenced the reconstruction of several cars, starting with the 935/78. Renamed the JR (Joest Racing) 001 type 935 81, it became the Joest version of the famous 'Moby Dick' 935. It was first seen on 22 March 1981 at the DRM Zolder meeting, finishing 3rd overall.

Porsche engine supremo Hans Mezger told the author: "It was a great car, insanely powerful; we fitted the biggest turbo that we could, and it is recorded as putting out 845bhp at 8200rpm. It had 600bhp at only 6000rpm." Sensational indeed! Reinhold Joest entered Jochen Mass to drive again at Hockenheim on 5 April; he won, beating the then-favourite, the Capri from Ford. He had already driven it to 2nd in the Nürburgring 300km and 3rd at Zolder, with very little testing. On 25 April, Gianpiero Moretti leased the JR1 from Joest and took it to the USA, running in five races between April and 14 June. He returned to Europe with the car to take a 2nd place and a 5th place in the two-race format Norisring 200, at the Norisring on

28 June.

Then it was back on a plane to the USA again for the Watkins Glen 6 Hours on 12 July, where he partnered Bobby Rahal to 6th place, before racing five more times in the USA and Canada, with a best result of 2nd overall at the Portland 100 Miles on 2 August. Through 1982, from the 6 Hours at Silverstone on 13 May, where Moretti/Baldi finished 7th overall, to the 1000km at Mugello where the same pairing finished 8th, the JR1 raced on seven more occasions. This driver pairing also did the Kyalami 9 Hours on 6 November, before taking the 935 back to the USA, where it stayed for the 1983 season running in IMSA, with Gianpiero Moretti/Sarel van der Merwe driving, and a best result of 2nd at the Pocono 500 Miles. In 1984, Moretti acquired an Alba AR3 and sent the 935 to retirement, selling the Porsche JR1 'Moby Dick' to the Swiss former driver Angelo Pallavicini.

February 1983 at the Miami Grand Prix: the JR-1 finished 18th with Jochen Mass aboard. (MS)

935-81 JR-2

1982 saw Joest Racing producing a second reconstruction of a ‘Moby Dick’ Porsche 935. The JR2 was built according to the IMSA GTX regulations. John Fitzpatrick drove the car with David Hobbs at that year’s Le Mans 24 Hours, finishing 4th overall. David Hobbs drove the car at the 200 miles Norisring, then the JR-2 went down to South Africa with John Fitzpatrick to drive with local ace lady driver Desiré Wilson; they finished 14th overall. The car then went on to the USA, where in the 1982 3 Hours of Daytona Fitzpatrick with Bob Wollek finished 15th overall. In February 1983 at the Miami Grand Prix, the JR-1 finished 18th with Jochen Mass aboard. But sadly tragedy was waiting at the Riverside 6 Hours for the JR-2. Derek Bell was sharing with Rolf Stommelen. Stommelen was at the wheel, when a competing car made contact with the 935, causing Stommelen to go wide, clipping the barrier. Two laps later, on the 94th lap, the rear wing broke, causing an immediate loss of downforce, which in turn caused a catastrophic loss of control. Suddenly Rolf Stommelen was a passenger. The car was thrown into the concrete retaining wall. Stommelen died on the way to hospital. The car was not rebuilt.

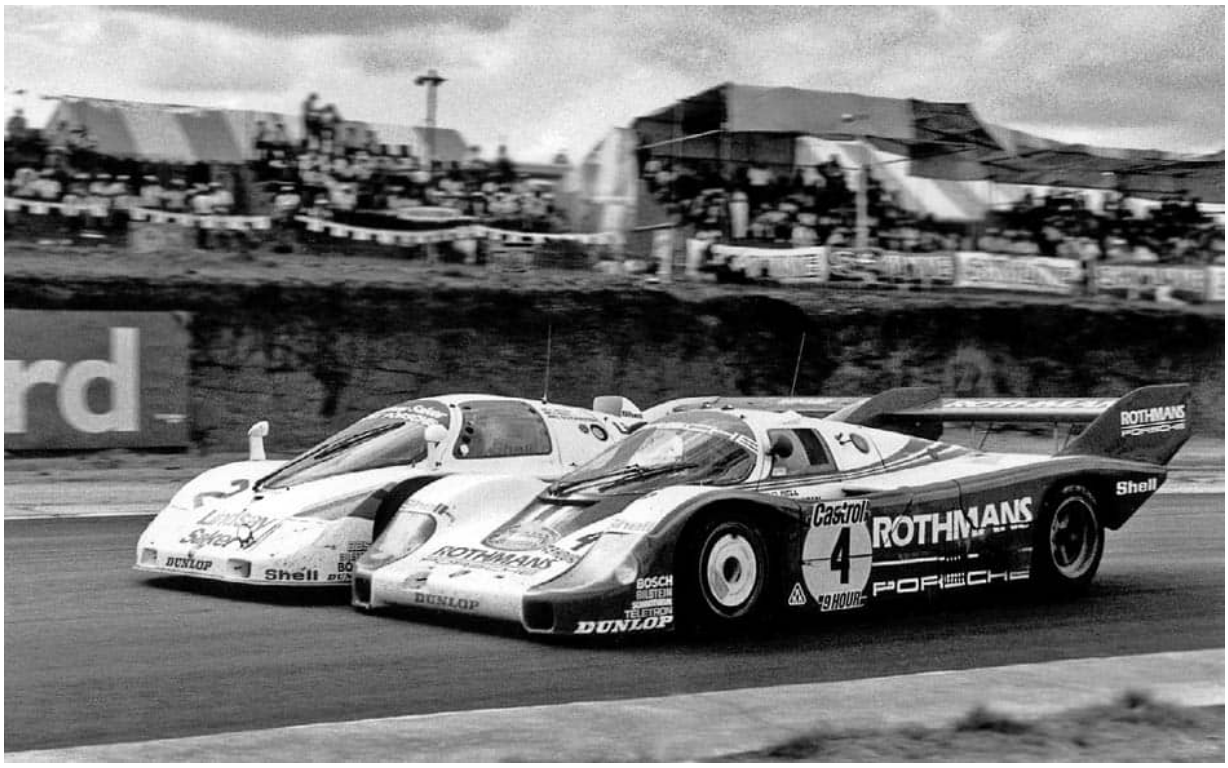
Le Mans 1982, the JR-2 was quick, but there was only going to be one winner that year: the 'Werks' Porsche 956s, taking the first three places. So who came 4th? From 27th on the grid but 30 laps down on the winner was the former fastest-ever Porsche. But even with 800+bhp its technology was old hat by this time. Even so, John Fitzpatrick says in his book: "We reached speeds of 203mph on the Mulsanne Straight which made that stretch of road seem shorter than previous years." (P)

Joest JR-005 936

As with Kremer, in fact just before Kremer, following the demise of Gr 5 and the coming of the Gr C class, many teams, including Joest Racing, built a special car as a stop-gap. In this case we are talking the 936 type. In the winter of 1981/82, Reinhold Joest created this new car to his own ideas, closely following the regulations of Gr C and loosely following the Porsche factory design. It was a space-frame chassis along the lines of the 936 Spyder factory car, but modified to have a roof structure. Wheels, suspension and transmission were consistent with the 936/77. The engine was a 2.6-litre, modified by Joest, the body being produced by Ekkehard Zimmermann's company DP, the same company that Kremer was

associated with. The Porsche 936C JR-005 ran first in the Interserie at the Nürburgring, where it finished 3rd overall, driven by the Belgian Jean-Michel Martin. In the FIM World Endurance Championship this Joest special 936 would race on some 25 occasions, ,with a best result of 2nd at the DRM Jim Clark Hockenheim race meeting on 10 April 1983. In the World Championship, it came 3rd overall at both Silverstone in the 6 Hours and at the 1000km of Mugello, where it was placed 1st in Gr C, both times in the hands of Bob Wollek.

936C JR-005 at Monza 1982: the Belga car is the Joest-built 936C, using a 936 tube/space frame and 936/917 running gear. (P)



6 November 1982: 9 Hours of Kyalami. Volkert Merl/Hans Heyer/Dieter Schornstein in the Joest 936C No 4; Derek Bell and Vern Schuppan in the 956. (P)

The Joest JR005 936C in fresh colours, seen here at Spa 1983: Dieter Schornstein/Jean-Michel Martin/Louis Krages ('John Winter'). (P)

JR005, Kyalami, December 1983: Leopold von Bayern/Siegfried Brunn/Klaus Grögor, 7th overall. (P)

Brunn/Schuster/Seher: Le Mans 1986 – the old soldier still going, if not a winner; 6th overall. It ran faultlessly, with its 25 visits to pits being only for fuel, brake pads and wheel changes. (P)

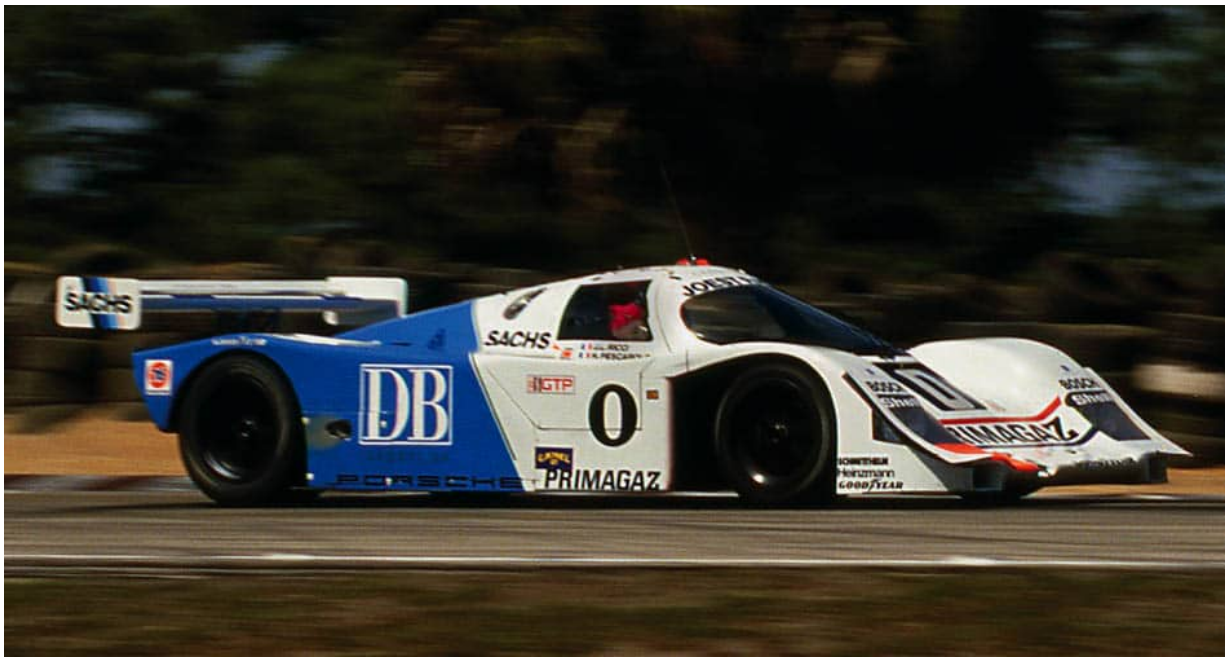
Up against the new 956 factory cars and then the 962s, the performances were by then not so impressive. The car finished its period of racing at the Southern Sun 500km at Kyalami on 23 November 1986.

Of course, the Reinhold Joest team was not to be left out of the game when the new cars from Porsche came along. In 1983, it was one of the first customer teams to get hold of the new 956 models, and in 1983 would be seen taking the fight directly to the factory cars. Porsche, of course, would be delighted – if customer teams could beat its works team, more customers would come along to buy the product. However, as we have seen, whilst the 956s would continue to run for many years yet, Porsche had a new kid on the block. From a proposal/request/suggestion by Al Holbert for a 956 to compete in the IMSA races in the USA, Jürgen Barth and Norbert

Singer responded with a new car that met the IMSA-USA regulations of fuel, construction, and putting the driver's feet behind the centreline of the front axle. The Porsche 962, first seen at the Daytona 24 Hours 1984, failed to impress on its debut with a dnf on lap 127. Having said that, it had been the fastest car there, taking pole, almost 2 seconds clear of the March-Porsche 83G of Sarel van der Merwe's team. (We will look at this team in a moment, under March-Porsche.) That result clearly demonstrated that the 962 was 'the' car to get. However, Joest would stay with the factory-supplied 956 until 1986, the final year of eligibility of the 956. Joest began running a 962 IMSA car, 962-116IM, at the Sunbank Daytona 24 Hours on 2 February 1986. It had a dnf on that occasion, going out after only six laps.

The Joest-run 962C utilising a Thompson monocoque numbered 116. This car was powered by a Type 935/79 DOHC 2826cc turbo engine. Seen here at the Norisring on 28 June 1987 for the Nürnberg 200 Miles: Louis Krages/Stanley Dickens, 3rd overall from the aggregated two-heat race. (P)

1990: built up by Joest in cooperation with Porsche with Porsche factory number 962-011: Jelinski/Pescarolo/Ricci at the Sunbank Daytona 24 Hours. A dnf on this occasion, after a 4th-place grid start. (MW)

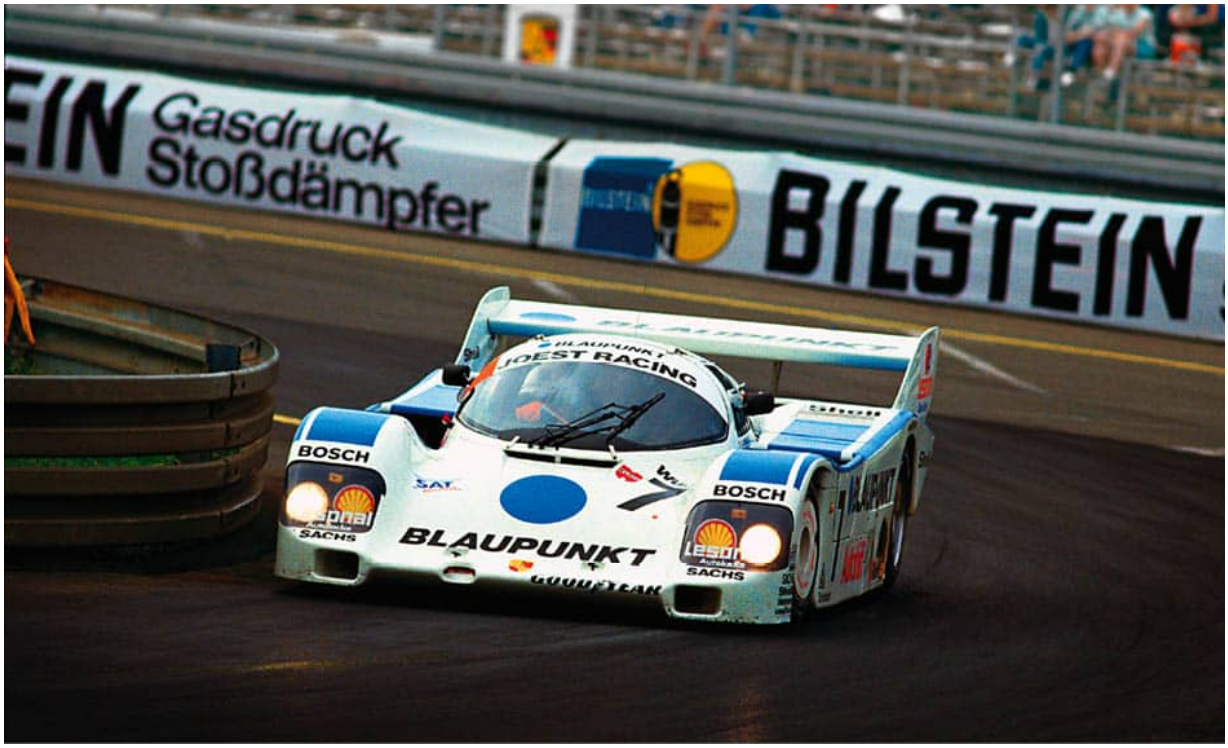


962-011 at the Sebring 12 Hours, 1990: 'John Winter' (Louis Krages)/Henri Pescarolo/Bob Wollek, 9th on the grid and credited with 11th in some records, but in fact it was not running at the finish. (MW)

For 1987 the team would follow the aforementioned Kremer route to acquiring an aluminium sheet/honeycomb sandwich construction chassis, turning to Thompson in England. Monza 1987 is the first we see of what is recorded of Joest-Thompson chassis 962C-116 – 4th overall with Louis Krages/Stanley Dickens/Klaus Ludwig aboard. The car ran No 8 through 1987. Also listed is a 962 'Joest' chassis 129 (a Porsche spare chassis supplied to Joest); driven by double driving Klaus Ludwig and Piercarlo Ghinzani, it recorded a dnf. It was at Monza 1987 that Porsche announced its withdrawal from the World Sports Car series. But it was not gone completely. Joest had the capability and would continue to have an excellent relationship with Porsche, keeping the flag flying. In cooperation with Porsche, Joest would continue to build up cars.

Other chassis, built up in cooperation with Porsche utilising Porsche chassis, are: numbers 962C 012 (formerly 149), 962C 013 (formerly 153), 962C 014, 962C 129, 962C 144, 962C 145. Two more chassis

tubs not made by Porsche but made by Stickel are 962-156 Porsche renumbered to 014, 962 158 renumbered to 015 (Porsche Werk records). We will continue with the Joest organisation in the next chapter.



Chassis 962-145: Joest, 2nd at the Brands Hatch World Sports Prototype Championship round, 23 July 1989. Bob Wollek/Frank Jelinski were doing the driving. (P)

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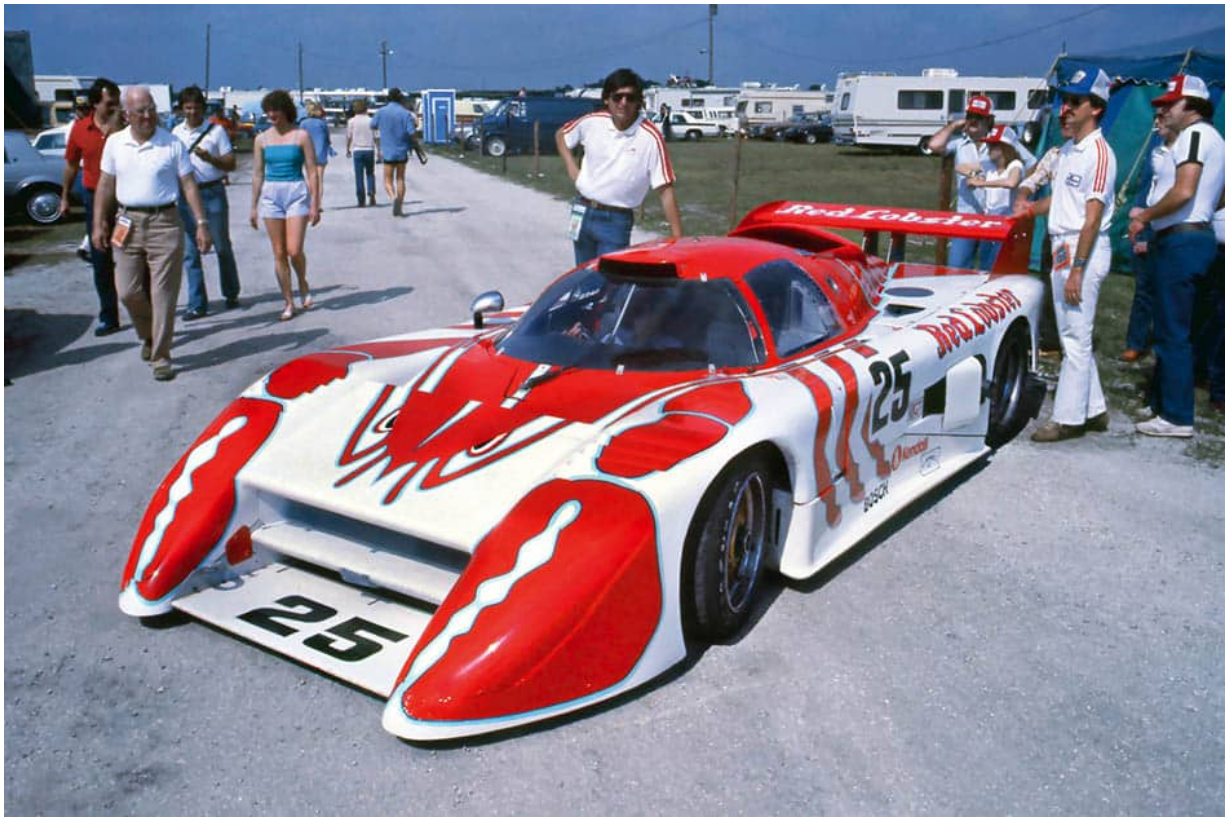
March-Porsche

March Engineering had been created in 1969 when a small group of enthusiasts, each talented in his own field, came together to create a racing team, the name using letters from each person's name: Max Mosley, Alan Rees, Graham Coaker and Robin Herd, and was based in Bicester, England. It made rapid and impressive progress, though like many of the period it had its tribulations too. Building cars for several single-seater formulas, up to Formula 1, and sports racing cars, it was almost inevitable that when the Group C era came along

March would get involved. By the early 1980s, March had pretty well maxed out its production for customers of F3 and F2 cars, Sports 2000s, Atlantics, and the Indy cars, 20 of which were to come out in 1981; F1, too, was still live. Over the years, the company's finances had been stretched on a regular basis. Yet come the early months of 1981, March had decided to build a GTP (Gran Turismo Prototype) called the 82G. Genius designer Adrian Newey had just joined the company, where he was to enhance his reputation. He created an aluminium honeycomb-sheet monocoque chassis, designed to take any engine on the market, which included Porsche. The bodywork would also be heavily influenced by Newey, who put out the build to one Dr Max Sardou, whose company, located just outside Paris (France), was a rapidly rising organisation, and the place to go at that time for the latest aero technologies. The 82G-1 was a little overweight, but with a Chevrolet engine in it, Bobby Rahal took pole at the 1982 Daytona 24 Hours. A second car, BMW-powered, also started. The spectacular 'Red Lobster' March caused a sensation; however, it dropped out during the race, which was won by the GAACO 935 JLP3 (we will review this car shortly). March was to build four Type 82G cars in 1982; all went to the USA. The 1983 International Series of Endurance Races started at the Daytona 24 Hours, where a Porsche engine is first seen in the March, but without immediate success. It was the same story at Sebring.

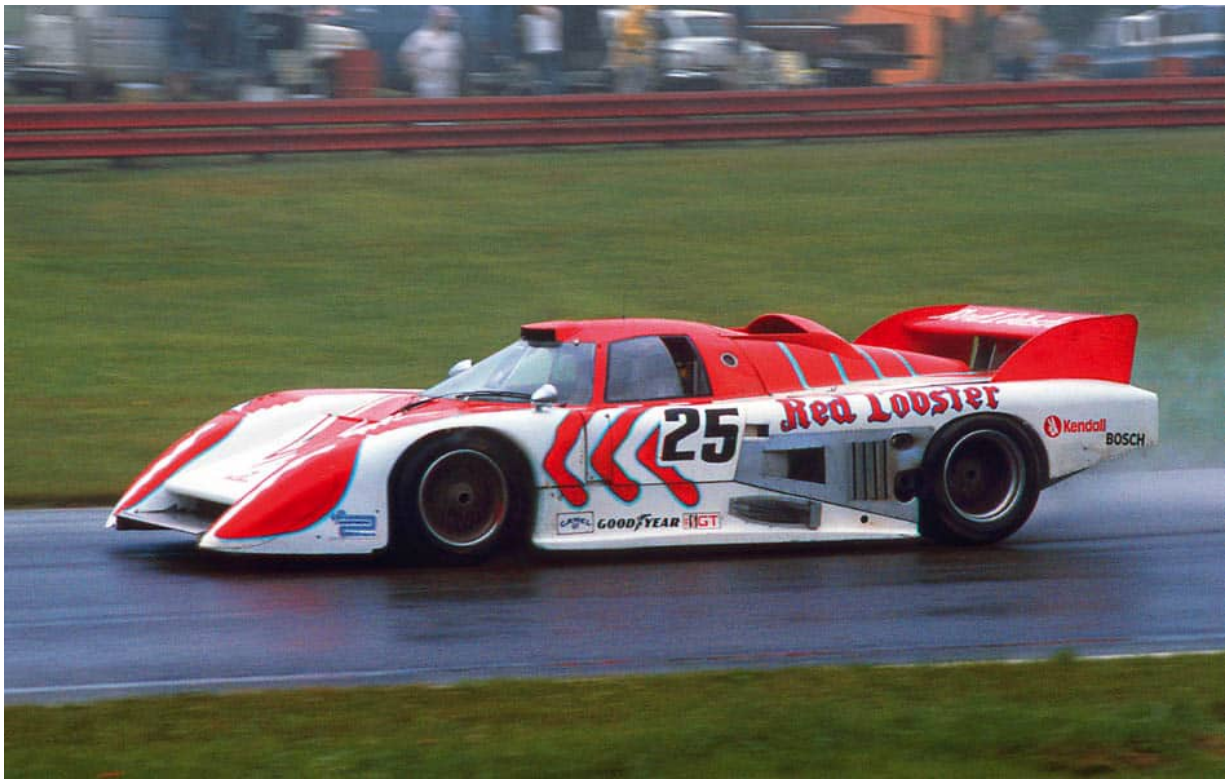


The David Cowart-entered March 82G Porsche, seen here at Sebring 1983; unfortunately, it was dnf again due to an accident. (MS)

On 10 April 1983 at Road Atlanta, the 'Red Lobster' No 25 March 82G-02, with Miller and Cowart on board, qualified 9th and came home 5th. We also see a new colour scheme and the first sight of another March-Porsche, the Momo car 82G-03 of Sarel van der Merwe/Gianpiero Moretti, but they had a torrid time, and did not finish.

Then at the Riverside 6 Hours on 24 April, Al Holbert appeared with a March 83G, though at first it had Chevrolet power. Meanwhile Moretti had gone to US Porsche engine specialists Andial for his engine. Andial Porsche engines would soon be seen powering the Holbert cars, too. Over the winter of 1982-1983, Holbert Racing had started construction of a new 924 GTR front-engine car, it was the second tube-frame and third Holbert-built 924 GTR (more of which we will learn shortly).

Tom Seabolt, former Holbert crew chief, says: “That tube-frame car was planned for Doc Bundy to run in Trans-Am in 1983. But Al was without a ride going into 1983, and I think he considered Trans-Am, maybe replacing Bundy, or with two cars. Then Al raced at the Daytona 24 in 1983 with Bruce Leven, and somewhere along the line a deal with March Engineering appeared. We took delivery first of a Chevrolet-powered March that would race in the Miami Grand Prix. It was a last-minute deal, and we were all hands on deck to get it ready. Holbert won the rain-shortened race because he was the leader when IMSA put out the red flag. We could by then see that several deals were coming along with March. A few new March cars would arrive and pass through our hands to go to other teams.” It was clear to all that this was where Holbert Racing was headed: towards March. David Cowart was also involved.



Mid-Ohio in the pouring rain: the 82G 02 now Porsche 935-powered, of Kenper Miller/David Cowart, 8th on the grid. The car would eventually dnf though, as at Daytona and Sebring. (MW)

The Sarel van der Merwe/Gianpiero Moretti March 82G-03-Porsche, Moretti's company Momo sponsoring the car; after a 17th grid slot at Road Atlanta, the team failed to finish. (MS)

Tom Seabolt again: "Ford had been courting Al to run its GTP programme; Al preferred to run with Porsche, but we couldn't use the 956, like they had in Europe. Al took the team out to dinner one night, laid all of his thoughts out, and let us decide: Trans-Am with Bundy driving the 924, the Ford GTP programme, or head down the path with March and an Andial Porsche engine. I'm sure the expected answer was Porsche and that's what everyone chose, the first March being the one at the inaugural IMSA Miami Grand Prix, with a Chevy engine. A lot of people were thrown at the effort and the car was tested en route to Miami; those folks and I followed directly to the race with the result mentioned previously.

"When we sold the third 924 car to Paul Miller, we knew a Porsche-powered GTP March was coming. It arrived at Charlotte, literally on a rollback from the airport, while we were practising with the Chevy-powered car.

"The car was roughly finished and you couldn't work on it without cutting yourself! We managed to do well with it, though, and won the

first race with the Porsche engine in it."

The car proved to be almost all-conquering, winning at Sears Point, Portland, and at the Daytona 3 Hours. At the end of the season, Holbert had won the IMSA GTP Championship over 100 points clear of Bob Tullius in the Jaguar XJR5. Holbert's power unit had been an Andial Porsche creation and Andial's Alwin Springer had earlier visited March in the UK to get the project under way. He says: "Dr Gianpiero Moretti of the Momo company had come to us to fit a Porsche into a March chassis; that was where the connection started."

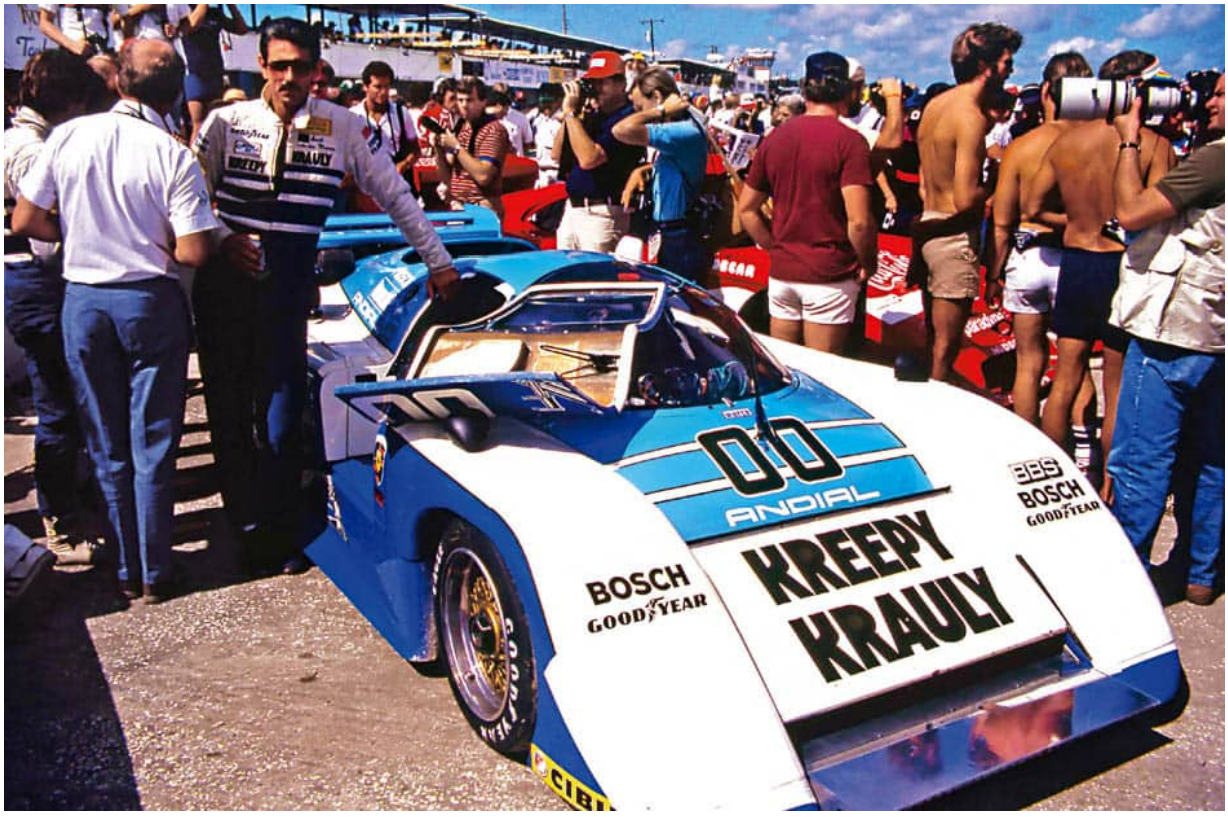
The new 83G March Porsche, with Chevrolet power to begin with, before the Charlotte race. Having won with a March 83 at the IMSA Miami Grand Prix, now with a Porsche engine it would prove to be an effective tool. Seen here at the Daytona 3 Hours, 1983. (MS)

Daytona 1984: Sarel van der Merwe showed the GTP IMSA boys exactly what a March-Porsche 83G-4 with an Andial engine could do, joining Porche's latest offering, the 962, on the front row. Not only that: it won the race outright! (MS)

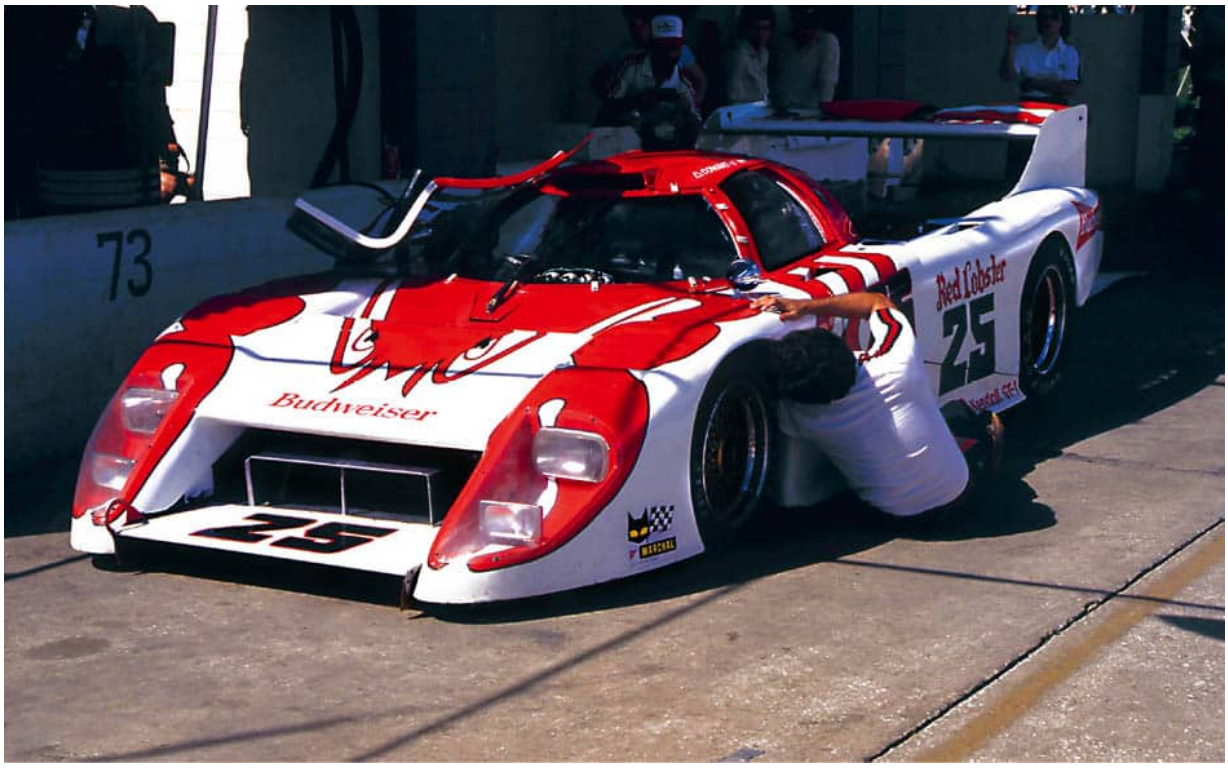
For the 1984 Daytona 24 Hours there was going to be a surprise, for Sarel van der Merwe, a rising star (though little known at the time), showed the GTP IMSA boys exactly what a March-Porsche could do, by taking a front-row slot alongside the pole-sitting Porsche, the new 962 from Germany, which had the Andrettis – father and son – in the hot seat. The surprise got bigger still when the 962 went out after just 127 of the 640 laps. Back to the drawing board for Porsche. But for the March it was pay-day and Porsche could smile a little, because it was a Porsche Andial engine that was in the Sarel van der Merwe/Graham Duxbury/Tony Martin, Daytona 24 Hours-winning March 83G. "With the Andial installation in the 'Kreepy Krauly' car, it was a good start to win the championship," said Alwin Springer. The March-Porsche would win by nine laps

ahead of the Preston Henn-entered Porsche 935L. However, at Sebring it would be the Joest Porsche 935 that would take victory, the March-Porsche 83G having qualified on the front row again with the same driving team in P2, alongside another new car: the Fabcar-built Jaguar XJR5. Unfortunately, the 'Kreepy Krauly' this time turned out to be just that, and went out on lap 132 with engine problems.

Also entered was the 'Red Lobster' 82G No 25 of David Cowart/Kemper Miller; also Porsche-powered. However, their suspension let them down on lap 158, and they would also switch back to Chevrolet power for future races. Shortly afterwards the 'Kreepy Krauly' car experienced disaster at Road Atlanta 1984, when the car was all but destroyed by fire. It was eventually rebuilt and did race again.



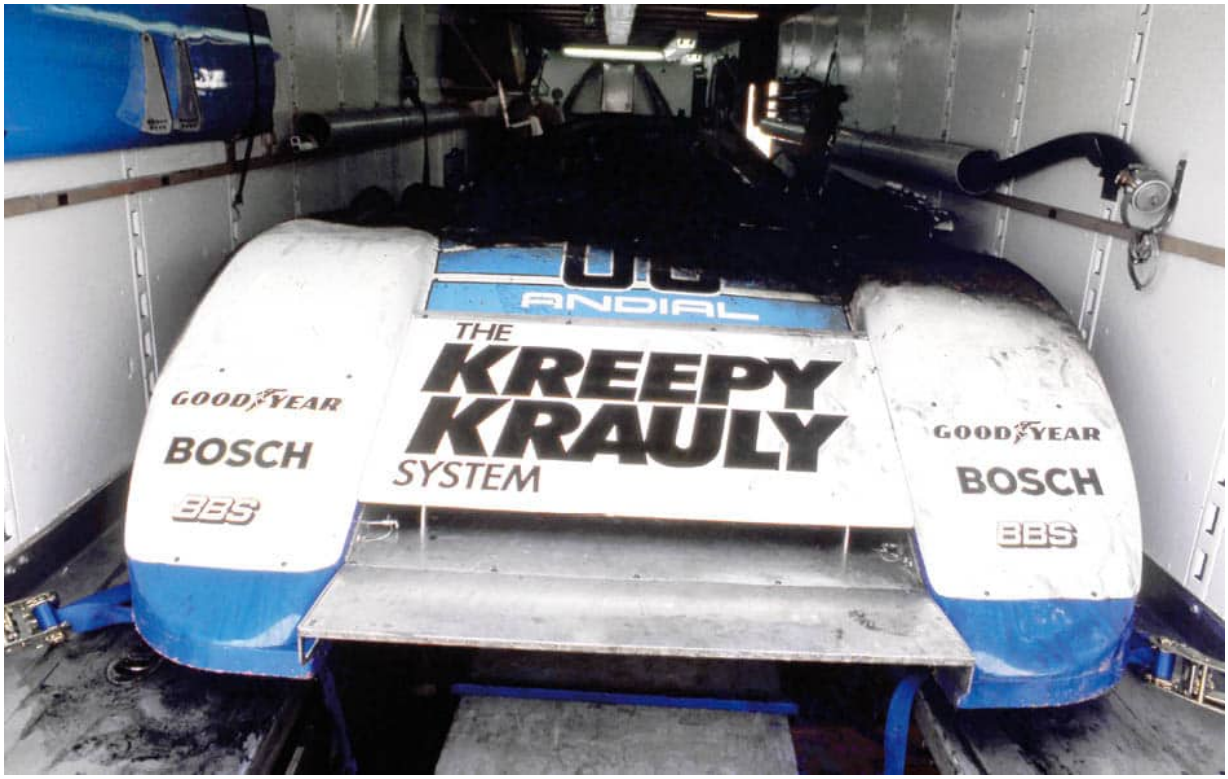
The March 83G-4 Porsche at Sebring, 1984. (MS)



Also at Sebring in 1984 was the March 82G 'Red Lobster' No 25 of David Cowart/Kemper Miller: Porsche powered, but it was the suspension that let them down on lap 158. (P)

Next we go to the Le Mans 24 Hours of 1985, and see for the first time in Europe, a March Sports Prototype powered by a Porsche engine. Sarel van der Merwe entered a March 84G, rebuilt to Gr C regulations, to run at the event. It qualified in the heavily populated C1 class in 14th place overall, with Christian Danner/Graham Duxbury/Almo Coppelli driving. In the race they were classified as finishers in 22nd place, the Porsche engine being a 956 Type twin-turbo 2649cc flat-six. Costa Los, a Greek businessman involved with shipping, acquired the 84G from van der Merwe. He ran it fitted with its Porsche engine, under the 'Cosmik Racing' banner. Costas Los entered the Hockenheim 1000km on 14 July 1985, the now green and white No 34 car qualified 16th on the grid of 37 that started the race. Costas Los/Christian Danner/Mikael Nabrink were the drivers (Nabrink had initially been involved with forming the Cosmik Racing team). Again the Porsche 962s dominated both practice and race.

The March-Porsche, however, was performing well until fuel-pressure problems caused its demise on its 118th lap. A long trip to Mosport in Canada followed, but it would be a wasted effort when a troubled practice left them starting at the back of the 19-car grid. Then a race of dramas saw the team run only 148 laps compared with the winner's 253, resulting in a non-classification at the finish.



Road Atlanta disaster: a fire put paid to any more racing for this 84G, at least for a good while. There is some question as to the exact chassis number of this car, according to John Starkey/Ian Briggs in their work Golden Era. (MS)

The March 84G (listed as chassis 01 in Time and Two Seats and official records). Here, for the June 1985 Le Mans 24 Hours, Sarel van der Merwe had converted it to run in the Gr C1 class. Christian Danner/Graham Duxbury/Almo Coppelli did the driving, finishing 22nd overall. A few extended pit stops of 21, 17, 39 and 42 minutes each delayed the team's effort. (FRAJ)

After problems at Hockenheim in July and at Mosport, Canada, on 11 August, we see the March 84G again here on 1 September 1985 at Spa-Francorchamps for the 1000km, round 6 of the World Endurance Championship and round 7 of the Drivers' Championship. Costas Los/Christian Danner/Mikael Nabrink: 7th overall. (PK)

Le Mans 1986: the Costas Los-owned 84G March, in Metaxa Brandy livery, suffered electrical problems and went out on lap 169 at 07.01h on the Sunday. (FRAJ)

On the car's return to Europe and the Spa 1000km on 1 September 1985, a good result was achieved after a 9th-place grid start amongst the C1 class. The result: 7th overall for the Costas Los Cosmik team. At Brands Hatch on 22 September, fast lady Davina Galica joined the driving line along with Swede Anders Olofsson and team owner Costas Los. An 11th place on the grid was converted to another 7th overall at the chequered flag for the March-Porsche 84G. On 6 October on the other side of the world to Europe, round 7 of the WEC was held at the Japanese circuit of Fuji. Richard Cleare joined Costas Los and Anders Olofsson in the 84G. However, an earthquake, torrential rain, and a delayed start greeted the drivers on the day. When the race did start, it was under the pace car for ten laps, but it was too much for many of the teams, including Cosmik Racing, as, along with 17 others, it abandoned. Staying in that part of the world, a visit to Selangor at Shah Alam in Malaysia on 1 December saw Costas Los/Christian Danner reunited in the March-Porsche to finish 8th overall after 217 laps for the winning 962, and 187 for the Costas Los team.

1986 saw the first World Prototype Championship round for Drivers start at Monza on 20 April – a Supersprint race. In car 66 (the 84G-

3) was Costas Los, who qualified 22nd of the 28 on the grid. He finished and was credited with 13th, even though he had not had a driver change at the appointed point, driving the whole race on his own. It seems no one noticed! At Silverstone on 5 May 1986 for the 1000km, Costas' March 84G was now painted black and yellow, in the livery of Metaxa Brandy and the Leamington Spa Building Society. However, Silverstone was to be a let-down for the Costas Los car, its engine failing after 24 laps. In June at Le Mans and the 24 Hours, after qualifying 45th in the 84G, Costas Los succumbed to electrical problems on lap 169.

Here we will take a step back to Silverstone in May. A new car had arrived in the UK: the March-Porsche 85G-06 of the Richard Cleare Racing team, a replacement for the Kremer CK5 covered earlier in this chapter. The newly acquired Richard Cleare Racing March 85G qualified 21st, but retired with engine failure on lap 40. Richard Cleare had bought the car from former IMSA team owner/driver John Kalagian. Peter Twitchen, Team Manager of the time, told the author: "Richard sold the Kremer CK5 as developed through 1984-1985. Richard and our new crew chief Australian Michael Negline flew to the USA searching for a suitable replacement for CK5-01. Initial inspections of March cars, both Porsche-engined 83G and 84G examples, were considered, and finally an agreement was reached to buy the 85G-06 from John Kalagian.

"The car duly arrived at Burnham (the UK base of the Richard Cleare team) fitted with an Andial 3.2-litre mechanically injected Porsche engine. In the USA, IMSA engines were set to run on totally different fuel-quality specifications, and unlimited quantity, as opposed to the Gr C regulations, which restricted fuel use. Although IMSA cars were allowed to run in their own class in the World Endurance Championship, they were still restricted to the same amount of fuel used by the Gr C cars. At the same time they had to conform to the power to weight ratio rules imposed by the IMSA regulations. Following detailed mechanical inspection by the team, body-panel repaint and new livery, the car was entered in the Silverstone 1000km, prior to competing against the full factory Mazda team in the IMSA GTP class at Le Mans, a single Mazda being entered at

Silverstone."

Silverstone, pre-qualifying testing, the March 85G (chassis 06) of the Richard Cleare Racing team. For the race Franz Konrad/Richard Cleare qualified 21st, but dnf'd due to oil-line failure on lap 40. (PT)

To improve both fuel consumption and reliability, Richard Cleare had purchased a new 2.8-litre IMSA-spec 962-based single-turbocharged engine from the Porsche factory, the performance of which was controlled by a Motronic fuel management system.

Peter Twitchen: "It was planned to use the 3.2-litre Andial engine at Silverstone and Le Mans practice and then install the new factory engine for the 24 Hour race. Following Silverstone, the 3.2-litre Andial engine was also planned to be converted to run with the Motronic management system. Unfortunately, due to not appreciating the significant fuel specification differences, the Andial engine failed during Silverstone practice. With the help of the Porsche Customer

Services division, run by Jürgen Barth and Gerd Schmid, our guys and the Porsche mechanics installed the new 962 engine overnight before the race. But it was a complex task, and was only completed after the race had started, the car joining the race some 30 minutes in! Franz Konrad was driving: he had been brought on board because of his experience in IMSA Marches; he broke the existing Silverstone IMSA class lap record soon after going out on track. After the first refuelling stop, Richard took over until he brought the car in with engine problems. It transpired this engine had also suffered a failure. With Le Mans as the next race, it was decided to have the 2.8-litre engine rebuilt at the Porsche factory. However, with the Porsche factory Engine Department time fully booked, we had to abandon the plans for the engines we had in mind for Le Mans.

"At Le Mans, the car was qualified 32nd on the grid by Frenchman Lionel Robert. Richard was also joined by Jack Newsum from the USA. The Mazda works team, our main competitors in the IMSA GTP class, started ahead of us on the grid, but both their cars got into trouble and dropped out relatively early in the race (laps 59 and 137). Our March suffered a split exhaust manifold, which also burnt out the starter motor wiring during the night. That caused us to lose over an hour." The team soldiered on, getting the car back running and still in the race. Peter Twitchen: "Richard was on board doing his stint, when with an hour to go the engine was seen to be losing power; during the last hour Richard had to manage that problem and also the fact that he had cracked front brake discs! However, he got to the finish and was classified 14th overall and 1st in the IMSA GTP class."

The former John Kalagian March-Porsche 85G-06, fitted with an Andial IMSA 3.2 spec engine, seen here at the Silverstone 1000km on its first eventful outing, 5 May 1986. (PT)

Qualifying 12th at the Brands Hatch 1000km, James Weaver/Lionel Robert/Richard Cleare's March 85G would be caught up in an incident on lap 41, causing a dnf for the Cleare car. (PT)

At the Brands Hatch 1000km on 20 July 1986, James Weaver joined Richard and Lionel Robert, qualifying the car 12th. Peter Twitchen: "We were using the 2.8-litre factory engine, the 3.2-litre Andial engine now being kept purely as a spare due to racing with the fuel economy restrictions.

"The car proved competitive with its Gr C counterparts, but after taking over from James, Lionel spun into the barriers on lap 47 after contact with a 956 and the resulting damage ended its race." The Costas Los/Tiff Needell Metaxa March-Porsche 84G would finish 9th in the slightly shortened race – a good result after fuel tank problems had seen retirement at the Norisring race on 29 June. The Metaxa-sponsored team had another 9th-place finish at the Jeréz Supersprint race, which was round 6 of the Drivers' Championship. 26 days later at the Nürburgring, in atrocious weather, both the Tiff Needell/Costas

Los Metaxa 84G and Richard Cleare/David Leslie's IMSA 85G March cars were involved in the infamous chaotic race being red flagged, due to a huge accident involving both the factory-entered 962 Porsches and other cars. The race was eventually restarted on lap 22, with the factory and the majority of the Porsche customer cars refusing to race in the unsafe circuit conditions. David Leslie's car had slid off the track on lap 11; luckily the car sustained no damage, though he lost a lot of time. The Cleare team withdrew to concentrate on Spa, which was to take place on 15 September. However, the Metaxa March of Costas Los and Volker Weidler did restart the Nürburgring race, and took their 84G to a 10th place; only 14 cars classified from 32 starters.

Another wet race at Spa saw the Costas Los Metaxa car start from 13th on the grid and finish 18th overall. Spa-Francorchamps was hosting round 4 of the World Sports Car Championship. Again the Richard Cleare Racing March-Porsche, driven by Richard Cleare/David Leslie, proved competitive with its Gr C rivals, qualifying 16th. However, during the race a recurrence of the split exhaust manifold forced their retirement on lap 40. The Costas Los Metaxa team took its 84G on the long trip to contest the Japanese round of the championship at Fuji, finishing 18th overall. This race signalled the end of the Costas Los March-Porsche 84G involvement, the team moving to contest the C2 category in 1987 with the TIGA marque.

The Costa Los/Tiff Needell March-Porsche 85G en route to 9th overall in the slightly shortened (by 2 laps) race at Brands Hatch. (C)

Peter Twitchen says: “For Richard Cleare and the team, running the March-Porsche 85G in the IMSA GTP class was proving more difficult, as the factory could offer no help with programming the Motronic management system chip to improve fuel consumption without a drop-off in engine performance. However, Richard went ahead with some aero improvements, again overseen by designer Val Dare-Bryan. The rear diffuser panel was lowered to conform with the latest Gr C rules, and a new flat bottom was fabricated, replacing the original March design. The tail section was shortened and the rear wing moved forward, to concentrate the centre of gravity nearer to the midpoint of the car’s wheelbase. An entry was filed for both Silverstone and Le Mans 1987 events. At Silverstone, having qualified 14th out of 26 starters, the car with James Weaver/Andrew Gilbert-Scott on board, Richard finished 9th overall and 1st in class. A good result, but during the final sector of the race, Richard had found it very frustrating as he had to drive, or rather cruise, to the finish,

mindful of fuel available. He put in a request to Porsche for technical help before Le Mans, but when his questions went unheeded he reluctantly decided, with additional mounting business pressures, to close down Richard Cleare Racing." Silverstone was the last time the car was raced by that team.

Earlier in the year, a March 83G-04 was to be seen with Porsche power at the 1986 Daytona 24 Hours, entered by great racing fan John Hotchkiss Snr for himself, Costas Los and Jim Adams to drive. Making 20th on the grid, the March-Porsche was a little out of date, but ran well until lap 402 of the scheduled 712 done by the winning car, the Holbert/Bell/Unser chassis 103 factory-built 962.

The Hotchkiss-entered March started at Sebring on 22 March 1986, but it was a poor day at the office when the engine expired on lap 38. The car continued to be raced through 1986, but then disappears in the period we are considering. March had had a good run, but the model type was now nearly six years old; it was time to move on.

Daytona 1986: the John Hotchkiss-entered March-Porsche 83G-4 for John Hotchkiss/Costas Los/Jim Adams entry; 20th on the grid of 69 starters, but it was to be a dnf due to gearbox troubles. (MS)

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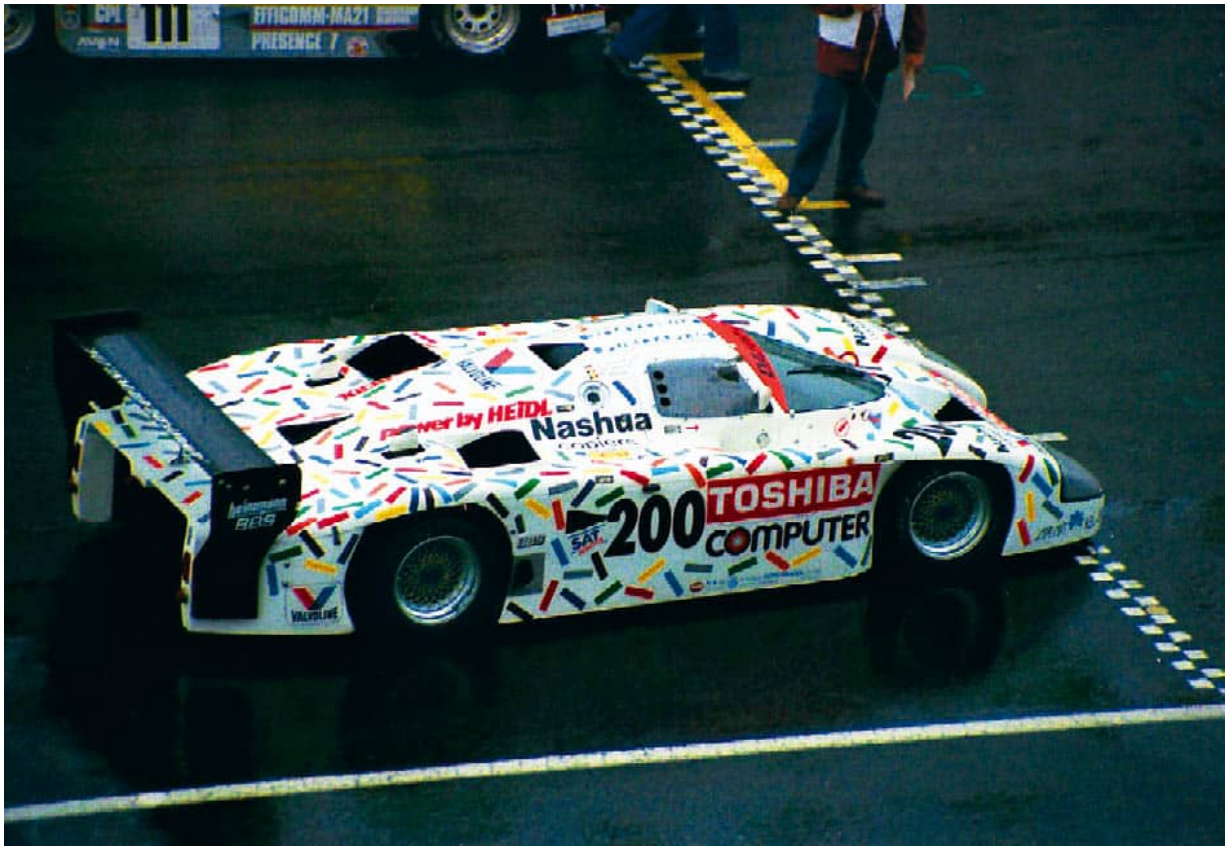
Argo-Porsche

With the coming of the new Formula for sports cars in 1982, the Prototype Gr C1 cars were joined in 1983 by the aforementioned C2 class. There were many small car makers that saw a chance here to succeed, without having to fight the big boys in the C1 class. Argo was one of these small companies. Set up as Anglian Cars Limited in Norfolk, England, the company was owned by Jo Marquart and Nick Jordan, and its target was the USA and the IMSA class. Predominantly, the Argo utilised Mazda and Buick, but other power units were also installed by clients of Argo – Ferrari and Cosworth, to name but two – and of course the reason for the marque appearing here is that they chose Porsche.



Le Mans, 13-14 June 1987: the Dahms Racing team Toshiba-sponsored JM19 Argo, powered by a Porsche twin-turbo 3.2-litre 930 engine. Their race was short, just 12 laps, 1 hour and 7 minutes of racing for driver Paul Fritch. (RS)

Designer Nigel Stroud was involved in creating the aluminium honeycomb monocoque JM16 in 1984, and it was decided to install a Mazda power plant. The JM19 development came along in 1985 in response to a new category in the USA, for which it had to meet the regulations for the Camel Lights Championship. It was extremely successful, though eventually as times and competitiveness changed, cars moved on to new owners, as did the car we see here: chassis 110, a JM19 created for Gr C2 racing. It appeared at the Nürburgring Supercup on 24 April 1987, with a Porsche 930 twin-turbo 3.2-litre engine. In a film on YouTube, it appears to have started at the back of the grid, though how it finished we are not sure.

However, we are sure about the JM19-Porsche's next appearance.

At the 55th Le Mans 24 Hours on 13-14 June 1987, it was entered by Manfred Dahms Racing team. Of the 50 cars that qualified to start, the Argo-Porsche was 39th on the grid. The racing gods were not, however, on their side: it expired after just 12 laps! The JM19-Porsche appeared again at the Brands Hatch 1000km on 26 July 1987, with Robin Donovan and Kenneth Leim at the wheel, but it didn't last to quarter distance: gearbox failure on lap 54 was its undoing.

It seems that it was then passed on, as old racing cars usually are, and reappeared at the Silverstone Supersprint on 14 May 1989. Driven by Helmut Gall, it qualified 15th of the 16 starters, but again did not finish. To some, maybe, a handsome car, but it never reached its potential with the Porsche engine, and by 1989 it was a dated design and just not competitive. The reader might also like to refer to the Royale car, of which we will see details shortly.

The Argo JM19 at Silverstone 1989 – too slow and outdated by now. (RS)

Royale – out of Argo, created by Nigel Stroud. Here we see a 1980s Royale England catalogue front cover. (DM)

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Strandell-Porsche

The Strandell-Porsche was the creation of Bo Strandell, who told the author: “After racing a Gr B Turbo, I had the idea to use this engine in a Gr C2 car, the engine being a 934 420bhp 3.3-litre unit. The monocoque was from a modified TOJ Gr 6 sports car (author’s note: thought to be a TOJ C390). However, it was an over-optimistic, underfinanced project, but not completely wrong!”

Bo Strandell was a competent and prolific accomplished racer, running many different cars during his time, racing cars including Ferrari F40s and 962 Porsches throughout the 1980s.

The Strandell-Porsche first ran in the 1985 Monza 1000km on 28

April, qualifying 26th of the 27 starters, in the hands of Stanley Dickens/Martin Schanche in the C2 class. Unfortunately, it was the first car to drop out, due to fuel problems. Bo Strandell says: “We were hit by fuel problems due to the poor quality of the fuels that year at Monza; it resulted in severe damage to the engine in practice, and so, too, as the race started. We lasted just three laps!” Undeterred, with a revised engine setting and the damage repaired, the Strandell rolled into Silverstone for the 12 May 1000km round 2 of the World Endurance Championship. Stanley Dickens/Martin Schanche turned in a credible performance, from a 30th in qualifying to a 13th overall at the finish of the race, where the 31 starters all finished. Running in Gr C2, they were 3rd overall in the class.

The Strandell-Porsche, one of the better examples of a ‘special’ racer powered by Porsche, but as Bo Strandell told the author: “An over-optimistic, underfinanced project, but not completely wrong.” (PK)

Next up would be the Le Mans 24 Hours. However, a disaster occurred when engine failure in practice with no spare meant Stanley Dickens/Martin Schanche didn’t get to drive the Strandell. They had qualified earlier in 48th. At the Hockenheim 1000km, the Strandell-Porsche failed to qualify. Things started to look up at Spa-

Francorchamps on 1 September, with a grid position of 23rd out of the 33 starters. Anders Olofsson/Tryggve Gronvall were the drivers; however, 38 laps in the gearbox cried enough, leading to a dnf. Fuel was still a problem, says Bo Strandell: “We didn’t have race petrol delivered at the circuits, and at the end of a frustrating season we reduced the ignition timing from 28 degree to 18 degree. Engine worked well then, but it was a bit too late – everyone else was going quicker.”

In practice for the Le Mans 24 Hours of 1986, Strandell tried again, with Kenneth Leim/Peter Fritsch/Lars Hellberg in the driving seat. However, the 934 Porsche 3.3-litre engine did not propel them to the grid: a time of 4min 19.32sec meant a non-qualification. The Strandell-Porsche was parked up. Strandell is recorded as later acquiring a Fabcar-chassised 962 car from Porsche, but it is recorded as not raced in period, although as Bo Strandell says: “It was tested.”

Le Mans 1985: practice in the week before the race; engine failure after qualifying in 48th place with no spare meant Stanley Dickens/MartinSchanche didn't get to drive that year's 24 Hours. (FRAJ)

The pristine 962-174 Fabcar chassis built up at Porsche and supplied to Bo Strandell. The author was told by Bo Strandell in 2016: "I bought it in 1993, I think, but I sold it on to a guy in Italy – no recollection of him now. It did not race in period, only tested." (JS)

Tiga-Porsche

The name Tiga is often pronounced 'Teega'. That's wrong: it should be pronounced 'Tiger' – so said the founder of the company, Howden Ganley, when the author caught up with him in 2016. Howden Ganley: "Tim Schenken and I had been friends for a long time – we first met when we were racing in Formula 3 in 1967 at Castle Combe. I was working on my car and this guy came over and said 'Good day!' and so I sussed out he's an Aussie and I'm a Kiwi and, well, we just seemed to get on from that day. He then went off in the other direction and did Formula Ford in 1968, and we both did Formula 3 in 1969. In 1970 I was given the works McLaren F5000 drive, while Tim got the works Brabham F2 drive. I did a few races in F2 when the races didn't clash with F5000. We both got full-time F1 drives for 1971 – Tim with Brabham, me with BRM. One day in 1975, Tim came to me and said he'd had this proposal from someone to finance the building of Formula Fords. I looked at the idea, and I called him up and I said: 'Hey, never mind the other bloke, why don't we do it?'"

Ganley by this time had begun developing a workshop, and indeed was building his own Formula 1 car. In 1975 he was to negotiate the acquisition of MRE (Motor Racing Enterprises). MRE was building Formula Fords. With the deal done, a new car in the design stages and the workshop set up, they were ready to go. But what would they call the car and the company? Howden Ganley again: “Tim wanted to call it a Ganley and I said no, it’s got to be something neutral. An animal name is good, but only one with a few letters. My wife sat down with a piece of paper and she juggled letters around and she said well, how about Tiga? It’s got four letters, it sounds like an animal. You couldn’t have Tiger because it was a trademark by Leyland. But Tiga was available, and it’s from letters in our names. We started in Windsor in 1976 in my workshop; because I’d built my F1 car there I had all the lathes and mills. We heard that the Fittipaldis were moving from their place in Caversham to Slough and so we got involved and did a deal in 1977. We were then able to have our own glass-fibre shop, our own machine shop, and soon everything was pretty much self-contained there. Tim did all the admin – the buying, parts, all that sort of stuff – and I did the design with a draftsman, and then I looked after a lot of the fabrication. Of course it grew and grew, and we had more employees and were building more and more cars and so it kind of took off. We built loads of Formula Fords and then when we got to Sports 2000, Thundersports, then CanAm. The original Caversham works was getting too small. We managed to buy a factory in High Wycombe. It was there that we designed and built the Mirage Gr C car for Harley Cluxton. We then realised that we could probably build a Gr C car for IMSA, and so we designed our own. The first Tiga Gr C1 car was model GC83. Where the cars were for Gr C2, they had a ‘2’ as the first number, so a C2 car in 1984 was model type GC284, and so on. Lights cars also had a ‘2’ in front, and were also designated with a T. Tiga C1, first built in 1983, was intended to take the Ford DFL engine, but not everyone could afford DFL, so many put a Chevy engine in it, and from there we had people wanting us to build more and more cars for IMSA, in Gr C. Everyone had a different theory about what engine you should use. We also built a smaller Tiga for C2 class in 1984. When US

customers wanted to run Camel Lights they used Mazda engines – they fitted beautifully into the engine bay. That led us big-time into the American market and when we saw Chevrolets, Ferraris, Buicks being put into a car that was designed to take the little Mazda unit, we decided to build a new car. We received an order from America, from Debbie Gregg (Brumos), and she wanted three cars to go IMSA Lights racing."

The GT286-Porsche, Mid-Ohio 500km 8 June 1986: 17th overall from 21 on the grid for Deborah Gregg/Jeff Kline. (MW)

Le Mans, June 1988: the GC287 Tiga of Charles Ivey. "We had to put the oil cooler in the nose: there was nowhere else to put it," says Howden Ganley. (P)

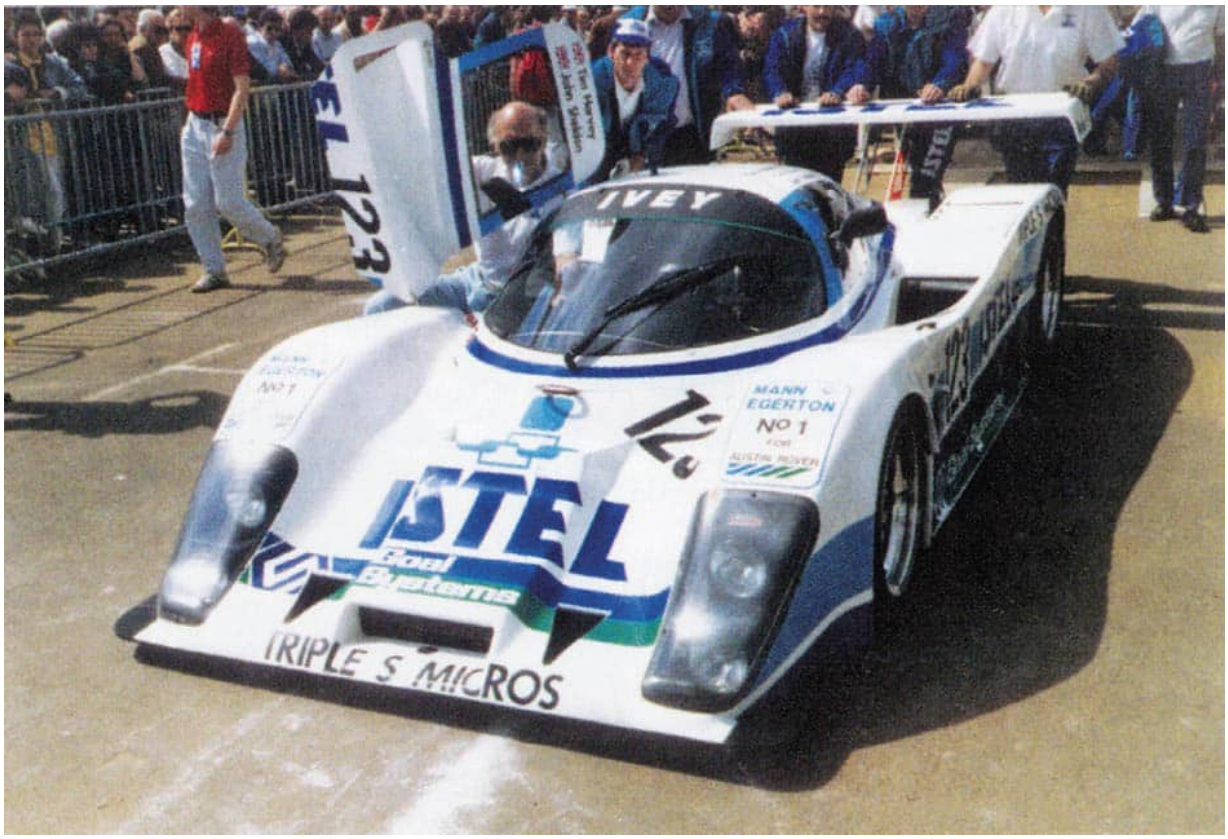
Howden Ganley continues: "Our American dealer was handling it. They were GT286s and would use Porsche engines, a 911 Type imposed by the IMSA regulations; they had Kugelfischer injection. It was a bit of a nightmare: we had to make special bell housings to get them to fit, as in standard form they were too long. Anyway, the cars went off to America, and of course we saw they were way down on horsepower with those engines.

"The model numbered GT286 Tiga-Porsche first raced in the USA on 27 April 1986. When I decided to sell up, Tim went to America to manage John Fitzpatrick's team." Of the Tigas in the USA, the GT286 331 is probably the best known. During 1986 it raced at the Riverside 6 Hours, Laguna Seca, Charlotte 500km, Lime Rock 150 laps, Mid-Ohio 500km, West Palm Beach 3 Hours, Road America 500 miles, and the 1986 Daytona Final 3 Hours. It appears then that the car was parked up until 31 January 1988, when Essex Racing USA's Bill Jacobson acquired it to race at the Daytona 24 Hours with Ron McKay/Jim Brown. They were 49th on the grid and finished 22nd

overall. Through 1988 it raced as an Essex Wire-sponsored car at the Sebring 12 Hours, Road Atlanta 500km, West Palm Beach 3 Hours, Mid-Ohio 500km, Sears Point 300km, and the Del Mar 2 Hours. It best grid slot was 21st, and best result 9th at the Charlotte 500km, with Deborah Gregg/Colin Trueman at the wheel.

Howden Ganley: “One day Charles Ivey gets hold of me and asks if we could put a 956 engine in. It’ll be a squeeze, I told him, but eventually said yes, we can. We had to put the oil cooler in the nose: there was nowhere else to put it. The thing was incredibly quick on the straight at Le Mans – it had a lot of power. In the end we built just four Porsche-powered cars: the three IMSAs for Deborah Gregg, GT 286s, and the C2 car, the GC 287, for Charles Ivey.”

Dudley Wood was the driver of the Charles Ivey Tiga at the Jarama Supersprint on 22 March 1987. He told the author: “It was an excellent idea, but it overheated because its engine would only just fit in the car. It was really made for a smaller-sized engine. It went alright, but I never really got to know it, because I remember we were told to do two laps, and after that we had orders to back off for two laps and then do another two, and then back off, and you can’t race like that!” The records show that the Charles Ivey Racing Tiga-Porsche GC287 raced on 11 occasions.



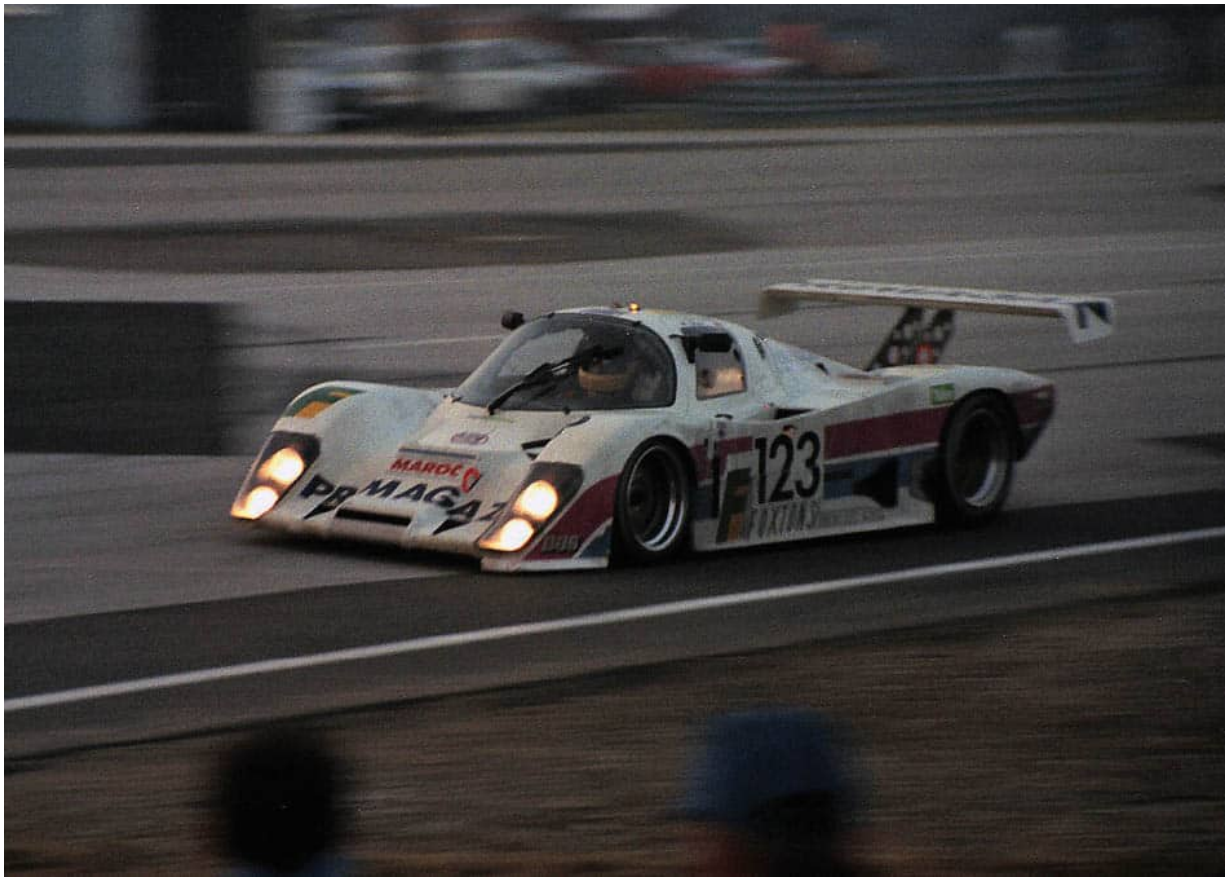
The C2 Tiga. “One day Charles Ivey gets hold of me and asks if we could put a 956 engine in. It’ll be a squeeze, I told him, but eventually said yes, we can,” says Howden Ganley. (HG)

Tiga-Porsche C2 European performances:

22/3/1987	Jarama Supersprint	Dudley Wood/Mark Newby	Grid 18th, dnf engine, 18 laps
10/5/1987	Silverstone 1000km	Ian Taylor/Pete Lovett	Grid 19th, 11th ov, 6th Gr C2
14/6/1987	Le Mans 24 Hours	John Cooper/Tom Dodd-Noble/ Max Cohen-Olivar	Grid 30th, dnf lap 224, crankshaft failure
26/7/1987	Brands Hatch 1000km	John Sheldon/Philippe de Henning	Grid 12th, dnf, accident
30/8/1987	Nürburgring 1000km	John Sheldon/Philippe de Henning	Grid 24th, not classified
13/9/1987	Spa 1000km	John Sheldon/Philippe de Henning	Grid 21st, overall 11th
13/3/1988	Jarama Supersprint	John Sheldon/Philippe de Henning	Grid 21st, dnf, clutch
8/5/1988	Silverstone 1000km	Wayne Taylor/Tim Harvey/Duncan Bain	Grid 21st, 11th ov, 4th Gr C2
11/6/1988	Le Mans 24 Hours	John Sheldon/Wayne Taylor/Tim Harvey	Grid 32nd, 20th ov, 3rd Gr C2
24/7/1988	Brands Hatch 1000km	Tim Harvey/Chris Hodgetts/Robin Donovan	Grid 17th, 12th ov, 8th Gr C2
2/10/1988	BRDC Silverstone C2	Chris Aylett/Andrew Marler	Grid 5th, dnf

From the Tiga's point of view a lot of changes were happening, and as Howden Ganley says: "Tim diversified into running cars for customers, as I wanted to ease away from the business. We were approached by a company who was interested in buying Tiga. I didn't want to do it any more, so we basically sold the lot and we went our separate ways. At that time, Vern Schuppan was renting Richard Cleare's workshop. Vern asked if he could rent our factory, so he did. One day he asked me if there was any chance I could do a day a week consultancy for them. So I said yeah, okay. Next thing, I'm there full time. So I started off for a second time with the Schuppan 962." We will hear more of the Schuppan-Porsches in the next chapter. Howden said: "Tim and I had agreed on the Tiga programme; that we do it for ten years, so that we had control of our lives, and we both wanted to move on to do other things, and we did. Building the cars was fun (but exhausting) – 400+ cars, with 33 of them being IMSA or Gr C cars."

The No 123 Charles Ivey Tiga, Le Mans 1987: John Cooper/Tom Dodd-Nobel/Max Cohen Olivar qualified 30th, and ran until lap 224 at 08.56 on Sunday morning. Crankshaft failure is listed in some records, though it says engine timing problems in the official records. (RS)



Le Mans in the murk: well into the race things were looking good, until the dnf on Sunday morning. (RS)

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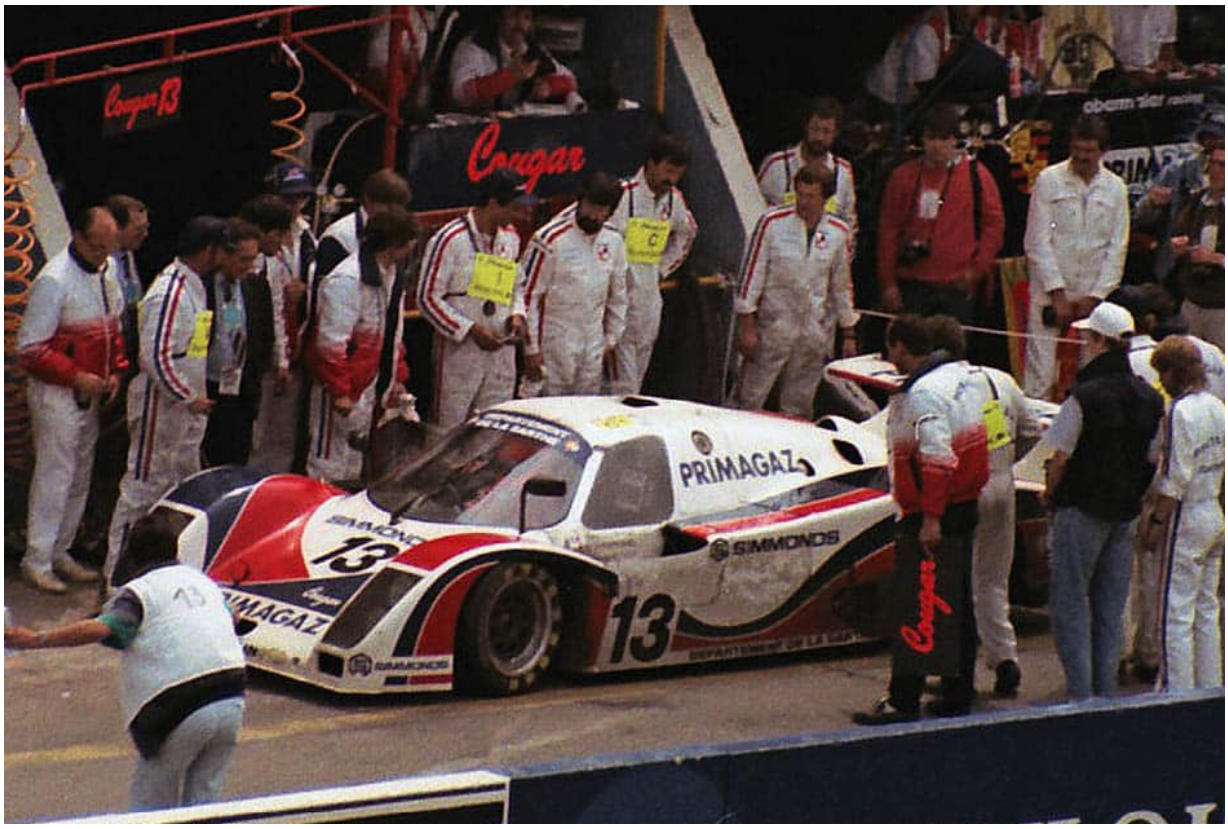
Cougar (Courage)-Porsche – Part 1

Yves Courage (not his original name, so the author was informed) was born in the right place at the right time: in April 1948, Le Mans hospital. Always a good thing to be in the right place at the right time! He grew up in Montaillé, close to where the 1906 French Grand Prix took place. Keen on sports, especially motorised ones, he started like most French race drivers with a secondhand R8 Gordini. He took to hillclimbing, and found he could be a winner. His progress and ability were recognised by the head of publicity with the Primagaz Group, Jacques Petitjean. Courage had 82 victories in his BMW-engined F2 cars by 1977. He'd had a brief Le Mans adventure in 1972 with Jean Rondeau, then would race regularly at Le Mans in the

cars of others from 1977 to 1981, winning the 2-litre class in 1981. It was after this 24 Hours that he decided to have his own car to run in the new Gr C era that began in 1982. A fortuitous meeting with Marcel Hubert, the aerodynamics guru of Alpine Renault through the 1960s and 1970s, led to the two men joining forces to create the first Cougar in 1982, sponsored by the aforementioned Primagaz. The C01 at first utilised a Cosworth 3-litre engine, and ran its debut race at the Nürburgring on 30 May. All was looking good until a burst tyre damaged the suspension, and eventually led to a dnf.



After several years of trying, Yves Courage at last got on the podium at the 1987 Le Mans 24 Hours; a fine drive saw them take 3rd overall in the C20 Cougar-Porsche. (RS)

The 1987 race was frequently punctuated by heavy rain. Pierre-Henri Raphanel/Alain de Cadenet/Yves Courage came 18th overall and 11th in class C. (RS)

June 1982 saw Yves Courage set out to race at Le Mans, but unfortunately gearbox failure led to the C01's demise. But true to his name, he set out again undaunted. Courage would run that first Cougar and a subsequent car through to 1984 with the Cosworth engines. By now, with his burgeoning workshops in the Sarthe, close to the Le Mans circuit, he was in a position to build a new car for 1985, and this time it would have a Porsche engine. The monocoque chassis, designed and built by Courage and Alain Touchas, had an aluminium honeycomb tub, using the technology for the mechanical items employed by Porsche on the 956 and then the new 962, the body shape again being formed with the guidance of Marcel Hubert. (More of Marcel Hubert's work can be studied in this author's work published by Veloce: *Alpine Renault – Volumes 1 & 2 – The Sports Prototypes*.) With the Porsche 935/76 2.65-litre engine giving 650bhp by then, in concert with Hubert's aero work, the Cougar was to claim

the highest speed on the Mulsanne straight in 1985: 231mph (371.75km). In the race, the new Cougar C12 was performing amongst the top ten for most of the 24 Hours, before an incident with another car during the night caused a problem with the suspension, resulting in damage and a couple of long pit stops causing a drop down the order. The Cougar had started from 18th on the grid; Yves Courage took his car along with co-drivers Alain de Cadenet/Jean François Yvon to 20th overall. Following this effort, the great Henri Pescarolo joined Courage to finish 21st overall at the Spa 1000km. Courage would run the C12 prototype C1 class car on 5 May 1986 at the Silverstone 1000km. However, his 18th position on the grid was to end with engine failure on lap 139. For the 1986 Le Mans 24 Hours, carrying No 13 again, Pierre-Henri Raphanel/Alain de Cadanet joined Yves Courage in the Cougar C12-Porsche to finish 18th overall and 11th in class C1.

Monza would be the opener for 1987, and this would be the place where Porsche indicated that it would be pulling the plug on Gr C to concentrate on other areas, namely Indy cars and Formula 1. Yves Courage brought out a new Cougar, again the work of Alain Touchas and Marcel Hubert. It was called the C20, and Hervé Regout and Pierre-Henri Raphanel would accompany Yves. At this point, Courage was considering turning his main attention to management rather than driving. On 12 April 1987, the Cougar C20 would see Joël Gouhier joining Hervé Regout at the Monza 1000km, where they finished 9th overall. But at Silverstone on 10 May, with Courage also on the driving team, the car suffered gearbox failure early on in the race (at 35 laps). At Le Mans, though, it was a different matter for the local man, and Courage, partnered by Hervé Regout and Pierre-Henri Raphanel again, pulled off the remarkable achievement for a private team of taking the 3rd spot on the podium overall behind the victors, the factory 962C, and in 2nd place the Hans Obermaier-entered 962C. The author was there to see it.

The sleek C20B in scrutineering for the 1988 Le Mans 24 Hours. (AJFR)

In 1988 Pierre-Henri Raphanel/Michel Ferté did the driving, while Yves Courage had decided to turn full-time to team management. Their race was over just before midnight, due to a fire in the pits. (P)

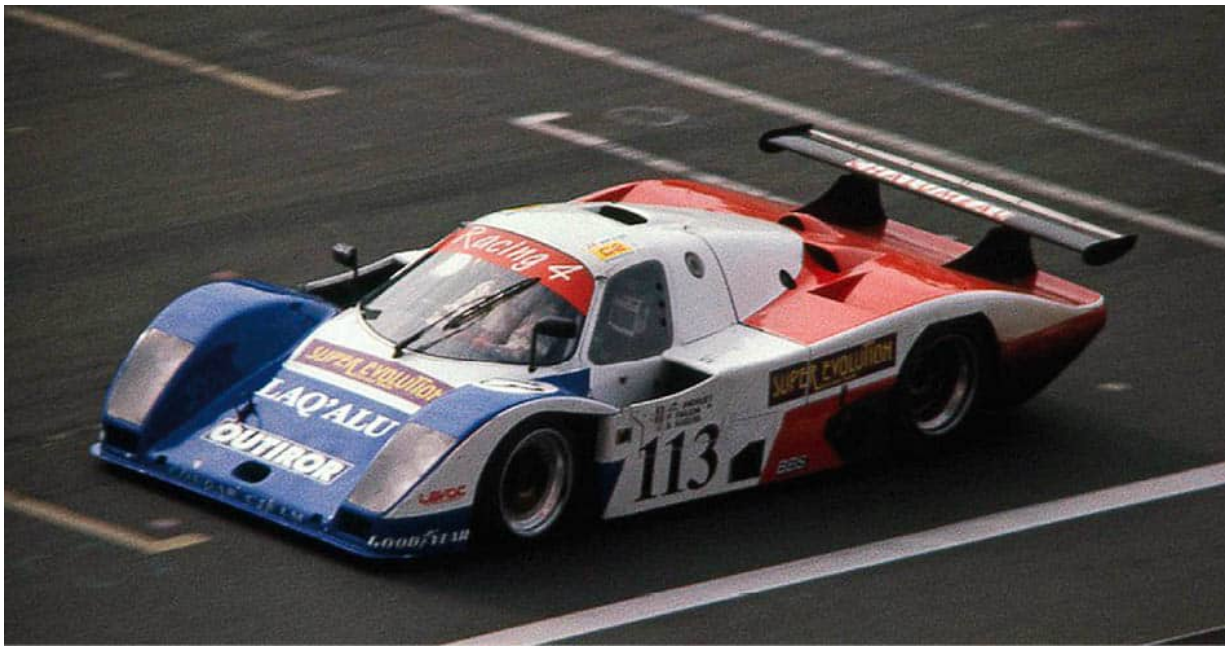
After the 1987 Le Mans, the C20 was parked up, to be brought out in 1988 as the C20 B. The 1988 Le Mans, though, would not be kind to Courage: both his cars – the C20 B and a new car, the C22 – both being non-finishers, car 13 being rendered hors de combat due to a fire in the pits at 23.47h on the Saturday. The C22 Cougar No 30 was badly damaged when it got caught up in a huge accident at Marshall post 121 on lap 66, at 20.15h on the Saturday, fortunately without any injuries to the driver.

The stories of the changes in regulations within the Gr C category over the years were to become legion! (The class C2 coming in 1983/4, tighter fuel restrictions in 1984, a points system change in 1985, Sprint races introduced in 1986, another points change in 1988.) Then for 1989 the Formula 1-style 3.5-litre atmospheric engines would be introduced for the Sports Prototype championship, the idea being to reduce costs by using the 3.5-litre non-turbo format to match that of Formula 1. Jürgen Barth told the author: “The reality

was that with influence from a certain Mr Ecclestone, the regulations were going to change to use the 3.5-litre engines then in use in F1. We went to a meeting in London where there was a big row with all the participants, those for and those against. We (Porsche was against) did not have a 3.5-litre engine and did not intend building one. The costs were too great." But there it was, the FIA was insistent that class C1 would be restricted to 3.5-litre atmospheric engines. Class C2, though, would continue with the allowed turbos; also, until 1990 the old C1 (pre-1989) cars were still allowed to run. The ACO who organised Le Mans was not amused, as we will see. It was also evident that gradually the privateers, like the Courage team, who made up much of the grids, were being squeezed. The turbocharged cars still running had their minimum weight increased to 900kg, whilst the new non-turbo cars would run to a low of 750kg, with no fuel limitations on the 3.5-litre cars. It was planned to phase out the turbo cars by 1991. Courage Competition decided to register in 1989 to run in the full Championship, rather than being Le Mans-only biased. Suzuka in Japan would see the first appearance of the C22 updated to the C22S. The No 13 car, driven by Pascal Fabre/Alessandro Santin, was chassis 3. They would finish 14th overall. In France on 21 May at the Dijon race, round 2 of the Championship, the Cougar-Porsche would finish in 6th place. The Le Mans 24 Hours on 10 June 1989 would be a non-championship race, the ACO having withdrawn its race from the World Championship series in a protest move against the FIA decision over the regulation changes. Le Mans saw three Cougars entered; however, only the latest chassis (04), a Type C20 LM, a category C2 car, would finish. The No 113 car driven by Jean-Claude Andruet/Philippe Farjon/Shunji Kasuya, though, would win the C2 class. The No 13 car of Fabre/Bousquet/Yoneyama suffered engine failure soon after midnight, and the No 12 Santal/Gonin/de Dryver Cougar C22 retired at 05.00h on Sunday due to electrical problems.

The Cougar was back in action at Jarama in Spain on 25 June for round 3 of the Sports Car World Championship, the No 13 car finishing 9th overall with Pascal Fabre/Bernard de Dryver/Jean-Louis Bousquet in the hot seat. Hervé Regout replaced de Dryver for the

Brands Hatch race, where the Cougar C22S finished in 7th place. On 28 August at the Nürburgring, Fabre/Regout came 9th overall, which was also the result at the Donington Park British round of the Championship on 3 September, though it would be a dnf at the Belgian round on the Spa circuit due to an accident on lap 45. Courage Competition did not go to the final round in Mexico. 1990 lay ahead, and chassis 5, the Cougar C24S would appear. We will continue with the Courage team in our next chapter, covering the 1990s.



Jean-Claude Andruet/Philippe Farjon/Shunji Kasuya in the Yves Courage/Philippe Farjon entry took overall victory in category C2 at Le Mans 24 Hours 1989. (AJFR)

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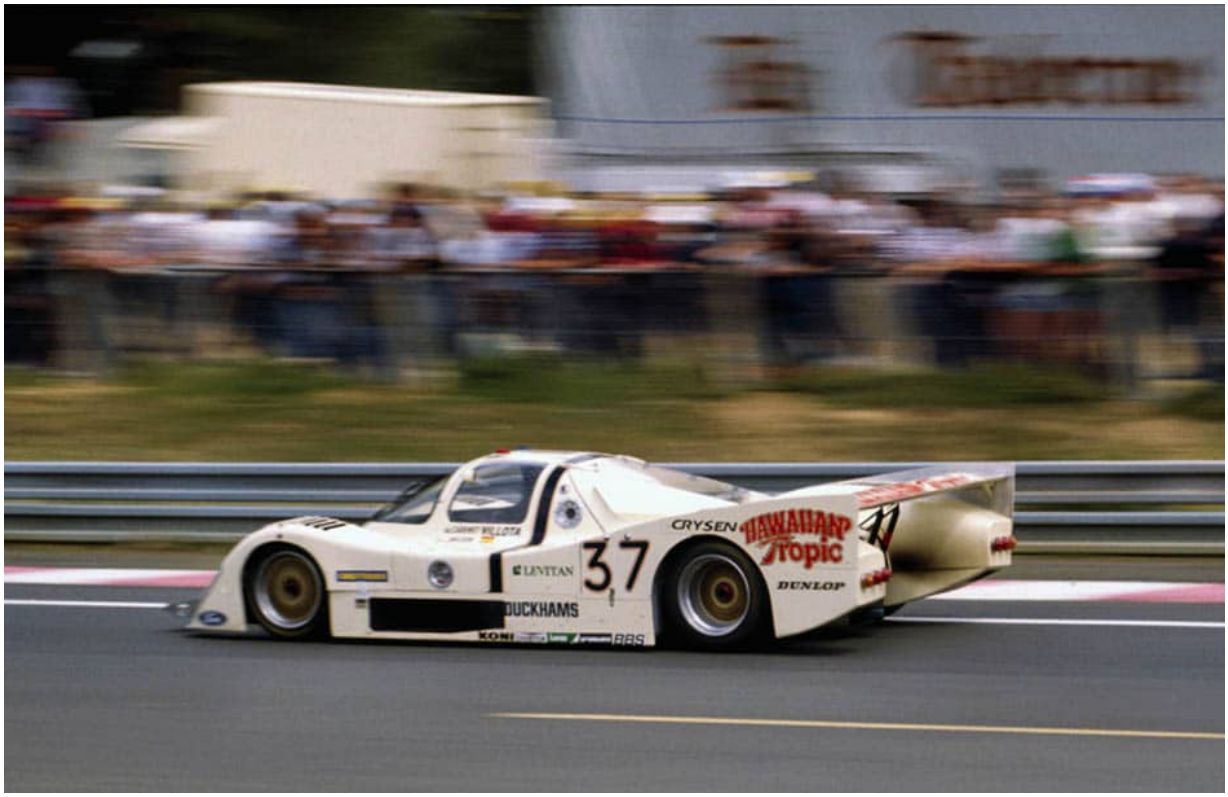
GRID-Porsche

Italian-born Giuseppe Risi and Briton Ian Dawson first met in the early 1970s, and entered endurance racing in 1981 when, under the GRID Racing banner, they ran a Lola T600 in the World Championship for Spaniard Emilio de Villota and Englishman Guy Edwards. Risi was de Villota's team manager, while Dawson had in

his curriculum vitae a spell at Lotus Grand Prix, where he rose to the position of chief mechanic. After a successful campaign with the Lola, they decided to build their own car for the 1982 Gr C category. The result was the GRID Plaza S1, designed by former Lotus man Geoff Aldridge; powered by a 3.3-litre Cosworth DFL. The honeycomb chassis tub was of a design reminiscent of the 'Lobster Claw' Marches. The first car, the GA 01, weighed in at 907kg. This is said to have been due to the body being too heavy.

During the 1982 season the GRID team headed to the USA, where it was to compete in various IMSA races. The S1 raced in the USA with little success, but when brought back to race at the Brands Hatch 1000km in 1982 it finished 10th overall. The car continued to race in the USA but success somehow eluded them, the car being plagued by the common DFL trouble: of the time: vibration. It was also found that the aerodynamics were a bit hit-and-miss. Over the winter of 1982/83, a new car was announced; this time the plan was to use Porsche power. Dudley Wood was the instigator; on ordering the GRID S2, he got Charles Ivey Porsche involved, and a Porsche 935 twin-turbo engine was transferred from Dudley's 935, a 935 Type 930/72 flat-six water-cooled 2920cc. With twin KKK turbos, titanium rods, Mahle pistons and double gear driven overhead-cam four valve per cylinder, single plug, the engine put out 630bhp at 8000 rpm.



The S1 with a Cosworth DFL; it raced at Monza, Silverstone, Nürburgring, Le Mans, and the Norisring, where the car was a shade of creamy white. (PK)

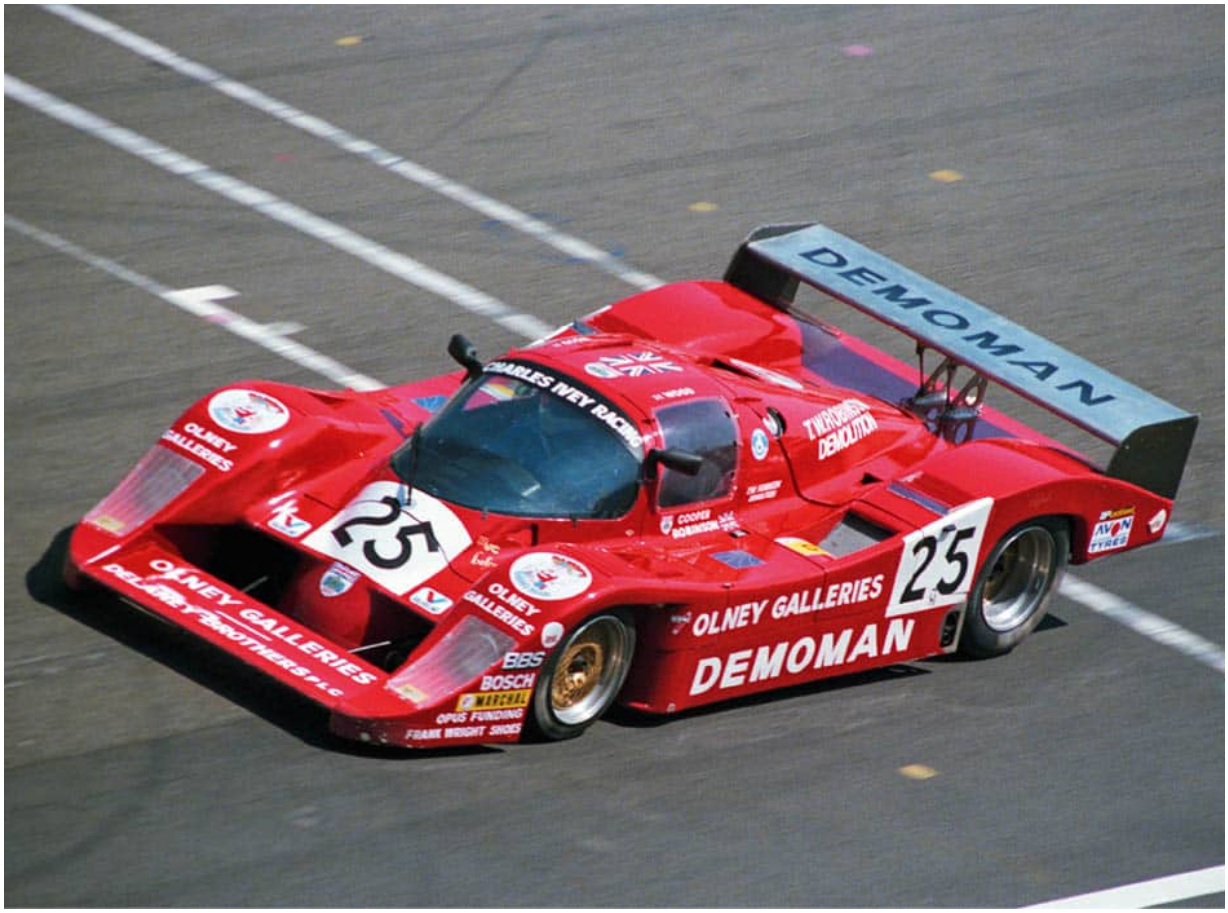
Emilio de Villota and Desiré Wilson raced the S1 pre-Porsche engine at Le Mans along with Alain de Cadanet. Wilson would join de Villota in the USA at the Mid-Ohio in September 1982. (MW)

Dudley Wood told the author: “That’s when the nightmare started! The S2 car was like the S1, still based on a Formula 3000. Basically it was fast; it handled beautifully, however it fell to bits, literally. I had owned the Porsche 935 K3 in which I had finished 4th overall at Le Mans in 1981. Of course, the rules for sports cars changed for 1982, so I thought it’s an idea to take the Porsche engine out of the 935, and ask Ian to build a GRID Porsche. Ian Dawson, I recall, operated from a place at Leamington Spa, and I had to keep going up there in order to push the project along. It took ages – most of 1983; he was busy on so many other projects – a right game, I can tell you. Then Ian and I fell out because he was out of money, and I handed the almost-finished car over to Charles Ivey to run it for us.” In the meantime, Dudley joined Fred Stiff/Ray Ratcliff at Le Mans in 1983, in the GRID S1 with the Cosworth engine (now back in Europe again), but it went out after six hours due to oil problems.

The S2 GRID-Porsche that Dudley had put his money into eventually appeared on a race track in anger in 1984 in the Miami 3 Hours in the USA, where Dudley had been lured over by Fred Stiff; Emilio de Villota shared the drive. The S2's race ended off the track in an incident, when a first-lap crash by de Villota put them out. A few weeks later, it made its World Championship debut at Monza. Dudley Wood again: "Ian had converted it over to IMSA single-turbo regulations, but back in Europe I altered it back to two turbos again and entered at Monza. But I had been racing in Spain, and at dinner the night before I left Spain, I ate a dodgy mushroom, and by the time I got to Italy I was almost at death's door. They had to take me into hospital. John Cooper, my co-driver, qualified the car, but he was not allowed to race it on his own. So that was Monza." They (Wood and Cooper) were next entered for the Silverstone 1000km. Here things began to look up: 22nd on the grid from the 44 that started. The winners would be the factory 956 of Jochen Mass/Jacky Ickx on 212 laps, and there on 178 laps and 16th overall was the GRID S2-Porsche. Not so bad after all – at least a finish.

Next up, the big one, the Le Mans 24 Hours. Wood/Cooper, joined by Brian Robinson, were qualified 29th of the 54 starters. Practice and qualifying had gone well. All looked good until ten laps into the race: disaster, of the human calculation kind. Dudley Wood: "Our team manager, who shall be nameless, miscalculated the fuel load; he hadn't reckoned for the warm-up lap at Le Mans, and it's not a short 2-mile lap! Yup, we ran out of fuel! That damn car was just unlucky!" As the reader will have seen, they were not the first to have made an error on the fuel calculations.

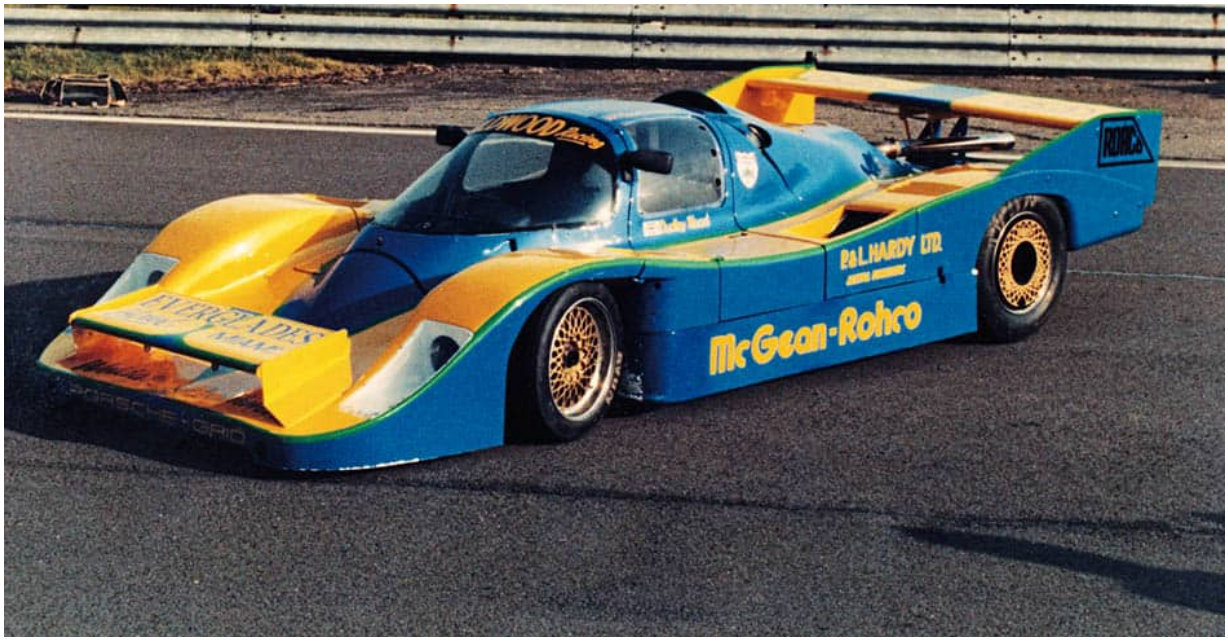
Dudley Wood/John Cooper/Brian Robinson at Le Mans 1984. All was looking good until they started racing. Ten laps in, a miscalculation of fuel load by a team member resulted in its early demise. (P)



Le Mans, the opening laps: the race started well, but trouble was looming. (P)

1984 Brands Hatch 1000km: the GRID S2-Porsche is passed on the inside of Druids Corner by the eventual 7th-placed Lancia LC C2-84 of Mauro Baldi/Pierluigi Martini/Bob Wollek. The GRID, driven by Dudley Wood/Brian Robinson, would finish in 11th place. (PA)

'Have van – will travel!' At the Mosport 1984 1000km the 21 car qualified 13th on the grid. Unfortunately suspension failure at race half distance meant a dnf. Brian Robinson joined Dudley Wood on this occasion. (DW)



The Grid S2 was modified, as seen here in a photo shoot at Silverstone. The plan was to run in IMSA races in the USA for 1985, but the project never came to fruition. (DW)

Dudley Wood: "We ran at Brands Hatch again in a Thundersports race at the Grand Prix that July (car No 7), where we finished 7th overall. Then we did the Brands 1000km on 28 July, where we got 11th overall.

"After that we went over to Mosport in Canada, which is an extremely bumpy track, and the mounts came out of the engine, because instead of having nuts and bolts holding it together it just had studs going into its alloy block, and it just literally fell to bits. It was not a happy car for me. Though it did handle well, I had had enough and sold it. It went to a guy in Mexico."

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Andial-Porsche

Andial built this car and supplied its motive power for Preston Henn's Swap-Shop company. It created a replica 'Moby Dick,' like 935/78, to the US spec requirements which featured a few differences to the Porsche/Joest versions. Alwin Springer, of course, was in touch with

all the Porsche runners via the supply of his excellent engines, and had contact with Dan McLaughlin and his AIR company based in Los Angeles. He had already created a special body for a Kremer K3, designed by US aero man Bernard Pershing, which was said to be more slippery aerodynamically than the other regular K3s. Pershing had created a body for the car, owned by Howard Meister, which also sported an Andial-built Porsche engine.

The Andial/Alwin Springer/Howard Meister connection led to Preston Henn, who was looking for a new car. Henn had been racing Porsches along with Ferraris since the late 1970s. Running under his company name of Swap Shop, he ran a fairly trick K3 for Bob Wollek to drive at the Nürburgring in the 1981 1000km and Silverstone 6 Hours. The Kremer K3 80 would run all season in 1982 in the USA.

The Howard Meister K3 935 with the Bernard Pershing body, created for a joint venture with Andial and team owner Howard Meister. Seen here with Rolf Stommelen/Harald Grohs on board, winners of the Road America 500 Miles on 23 August 1981. (MW)

The 935/78-style 'Moby Dick' replica, built specially by Andial, at the 1982 Daytona 3 Hours: Al Holbert/Doc Bundy/Preston Henn, 4th overall. The car won the 1983 Daytona 24 Hours in the hands of Bob Wollek/Preston Henn/AJ Foyt/Claude Ballot-Léna. (MS)

The new Andial 935L 'Moby Dick' car on its first racing outing at the Riverside 6 Hours, 25 April 1982; Holbert/Grohs came 2nd overall. (JB)

The 935L, Bob Wollek/AJ Foyt/Claude Ballot-Léna took Preston Henn's latest project, the Andial version of the 'Moby Dick' car, to victory in the 1983 Daytona 24 Hours. (MW)

Alwin Springer told the author: “The car was built from scratch in the Andial workshop, and was our answer to the Kremer K4, which it soundly out-performed!” Glen Blakely, Drino Miller, Dieter Inzenhofer, and Alwin Springer were the main men involved in its creation, with the bodywork being by Dan McLaughlin in Burbank. Alwin Springer: “Preston Henn purchased the car from us and Kevin Jeannette (Gunnar Racing) fielded the effort to run the car at the races for the team. The car still exists and is in Preston Henn’s collection.”

The new Andial 935L ‘Moby Dick’-style car first appeared at the Riverside 6 Hours on 25 April 1982 under the Andial/Meister name, and in the colours seen on the earlier 935. Al Holbert and Harald Grohs came from 46th on the grid to finish 2nd overall from the 52 starters, the winner being Ted Field’s Lola T600 shared with Bill Whittington, which had started from P2. The 935L appears to have been rested then until the Daytona Finale on 28 November 1982; by then it was in Preston Henn’s Swap Shop livery. The new car created by Glen Blakely for Andial saw Doc Bundy/Al Holbert joining Preston Henn in the car; this time the 935L was to finish 4th overall. The Joest 935-78 02 ‘Moby Dick’ of John Fitzpatrick with Fitzpatrick/Bob Wollek finished 2nd, the winner again being Ted Field in the Lola T600.

For the opening race of the season 1983, the 24 Hours of Daytona, Preston Henn brought on board Bob Wollek, Claude Ballot-Léna and AJ Foyt. In practice, the 935L with Wollek at the wheel outclassed the competition and took pole position with a time of 1min 42.155sec – the fastest time ever with a Porsche 935 in Daytona – his speed recorded at 135.324mph. Only the Interscope Lola T600 reached similar times; all other vehicles were at least four seconds slower. In the race, the car proved unbeatable. The rest of the season, though, was to see several failures and technical problems. At the beginning of 1984, at Daytona and Sebring it once again won a place on the podium: 2nd at Daytona and 3rd at Sebring. On both occasions Derek Bell/Bob Wollek joined Preston Henn.

After the Daytona win in 1983, the car would run at the Sebring 12 Hours. Pole position, but a dnf in the race. (MS)

Racing as a 935L, the Andial-created and Andial Porsche-engined car qualified 4th on the grid at the 1984 Daytona 24 Hours, finishing 2nd overall, where Derek Bell/Bob Wollek joined Preston Henn in the now shorter-tail version. (MS)

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Holbert Racing-Porsche

Father of Al Holbert, Bob Holbert started it all when he opened a garage in the late 1940s in Warrington, Pennsylvania. In 1951 he moved to a new premises close by, thus starting a business and racing team that was to become world famous. 1954 saw Holbert become an authorised Porsche dealer in the USA. Bob Holbert raced Porsches from then on, very successfully, winning four SCCA National Championships and a podium finish at Le Mans with Masten Gregory. Al (short for Alvah) Holbert was born on 11 November 1946. Born into this family, racing was sure to be on the cards, and he started in the northeast division of the SCCA in a C-production Porsche 914/6. This

was long before he graduated from University in 1968. Al Holbert started working for the then-new Penske Racing, working out of Newtown Square, Pennsylvania, a short distance from the Holbert residence in Warrington. Another future star driver was also working as an engineer: Mark Donohue. The two became good friends.

Jo Hoppen had been appointed head of a new motorsports department in North America for Porsche+Audi, and appointed Holbert Racing to take on board the new 924 front-engine Porsches for racing in 1979/80. This was to grow into bigger things, and we will take a look at the front-engine cars later in this chapter. For this part of the Holbert story, we will pick it up just after the 924 erat. Al Holbert had sold his cars, turning to the March for 1983, as we have seen in the March-Porsche section of our study. The 956 was not eligible for use in the USA. Holbert was keen to use it, and suggested to Porsche Stuttgart that maybe it could look at an IMSA-legal version. Jürgen Barth and Norbert Singer were listening, and during 1983 this had led to them creating the 962, which would arrive in the USA in 1984. Al Holbert would be a prime player, as he was with the earlier cars. The first Porsche factory 962s arrived in the USA with 2.8-litre engines and a single turbo. Things didn't go well for the factory cars, both failing at the opening race at Daytona in 1984. Taken back to the factory pretty quickly, they did not show again until April, at the Riverside 6 Hours. From 3rd on the grid, Al Holbert/Derek Bell were to finish 2nd overall in the 962-101 acquired from Porsche. Holbert prepared the car, and it was entered by Bruce Levens' Bayside Disposal. This car had the Löwenbräu sponsorship.

Outside the Holbert Porsche dealership: Al is in the car, with father Bob looking on. (RS)

Al Holbert took a first victory in 1971 in an ex-Peter Gregg SCCA 914/6. This shot is in 1972 at the Road Atlanta run-offs. He turned professional in 1974, racing a 911 Carrera. (RS)

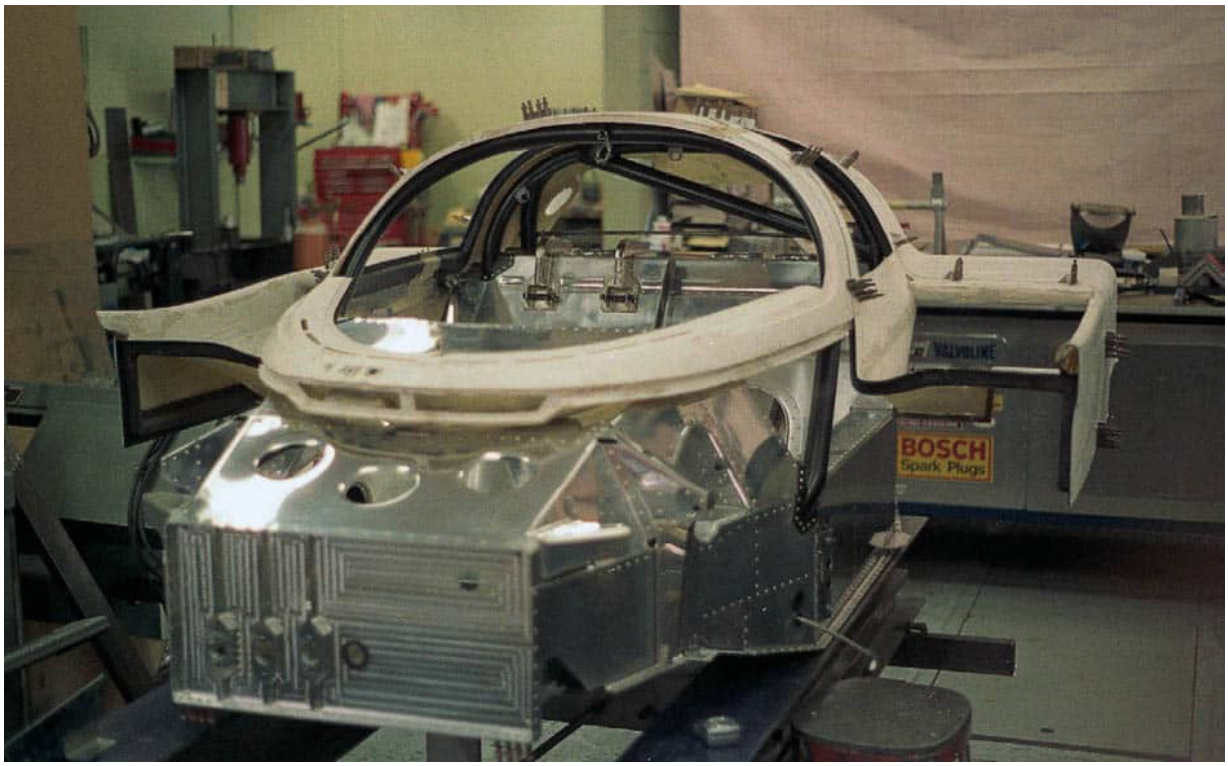
As we are already aware, at this time Porsche was stretched, chasing a World Championship, developing the new 959 and busy

building and servicing engines for the World Championship team, as well as starting to look at F1 and Indy cars. So it was not long before a deal was struck with America's top Porsche engine specialists, Andial, whose engines had proved to be reliable since the days of the 914 in the 1970s and the 935s in 1981. Porsche had not enough time or personnel to provide its usual service to the USA as well as service its other activities. A deal was struck for Andial to take engines and engine component parts supplied by Porsche, and develop the 3.2-litre unit with matching electronics and engine management that was becoming the latest technology. It was a perfect situation for Andial and perfect for Porsche. Andial started to fit the USA home-market Garret turbochargers instead of the KKK, and a Motronic engine management was selected. Andial had Alwin Springer as the key engineer and he, like his colleagues, had been part of Vasek Polak's Porsche operation, working on all Porsche cars and engines, including the 917s and CanAm cars from many years before. Andial would receive an engine from Porsche Germany, then, in true American tradition, took it apart and totally rebuilt it, incorporating any modifications required to suit the IMSA or SCCA regulations, but also to increase performance and ease of repair, such as the fitting of the aforementioned locally sourced Garret turbochargers. The company had really made the breakthrough into the big time with the 935, and also with its own Andial-built car, the 'Moby Dick' 935L. Porsche, as stated, supplied chassis 962/101 to the USA, which went via Holbert to Bruce Leven; 102 had gone to Bob Akin, and 103 also to Al Holbert. Al Holbert had brought on board the Löwenbräu beer company for 1984, sponsorship which ran throughout the 1984 season, at first on the aforementioned factory chassis 101, then on 103 which ran from 20 May 1984 to 7 July 1985, scoring ten victories and numerous podiums. Seventeen times, Derek Bell was Holbert's co-driver.

Much has been written of these wonderful factory cars and as the early ones are factory chassis they are not on our radar. We turn therefore to the first Holbert-built 962: the HR1.

It is worth mentioning, too, that from 1 January 1984, Al Holbert had taken over as Porsche Motorsport's first president, following on

from the different but similar position held by Jo Hoppen, who was retiring. On 28 July 1985, the first Holbert 962, the HR1, saw the light of day. Tom Seabolt, then team manager at Holbert Racing, told the author: “The HR1 was completely built in-house at Holberts’, as was HR2, which went to Bruce Leven.”



The HR1 tub under construction in the Holbert works in 1984. It is thought the early chassis were single-sheet aluminium. (TS)

Tom Seabolt says of that first race for the cars at Portland, Oregon: “Al Holbert qualified both cars, putting No 14 on the pole and No 4 next to it on the front row. Rules about driver pairings, who started the car, etc, were different then. Derek Bell also had an IROC commitment that weekend and since both Al and Derek were listed on both cars, either driver could qualify. Derek wasn’t there to qualify, so Al jumped in each car. In the morning warm-up on race day, Derek’s car was over-boosting. We thought it would be fine, but damage must have occurred, because the engine blew a few laps into the race. Al went on to win in the No 14 HR1 chassis. So it was a

good and bad day."

Tom Seabolt again: "Al constantly modified the 962 to optimise it for the slower and tighter North American tracks. He developed an over-engine turbo installation and intercooler to reduce throttle lag, and reconfigured the rear wing and front wing to increase downforce. Looking at those early mods, it's no coincidence that he went on to win three GTP championships in four years. We only had six employees; the rest came along at weekends. When it got down to crunch time, you'd often get to work in the morning and find out that he'd been there all night." Hurley Haywood comments on Al: "He became a born-again Christian, and it turned his life around. He didn't wear his religion on his sleeve, but he made no bones about his principles, off and on the racetrack. Of all the guys I've raced against, I enjoyed racing against Al the most. He was fair. Always raced you clean. He never did anything to put you in a difficult situation. Not that he'd wave you past: he was very competitive. I'd say to him, 'Give me a break! God's on your side!' And he'd just smile and say, 'No, it doesn't work that way!'"

Testing at Pocono: the first Holbert car being unloaded at the Pocono Raceway for an initial shakedown. (TS)

The new HR1 preparing for further tests, now fully liveried up before race day at Portland Oregon. The guy in the shorts, on what must be a hot day, is Derek Bell. (TS)

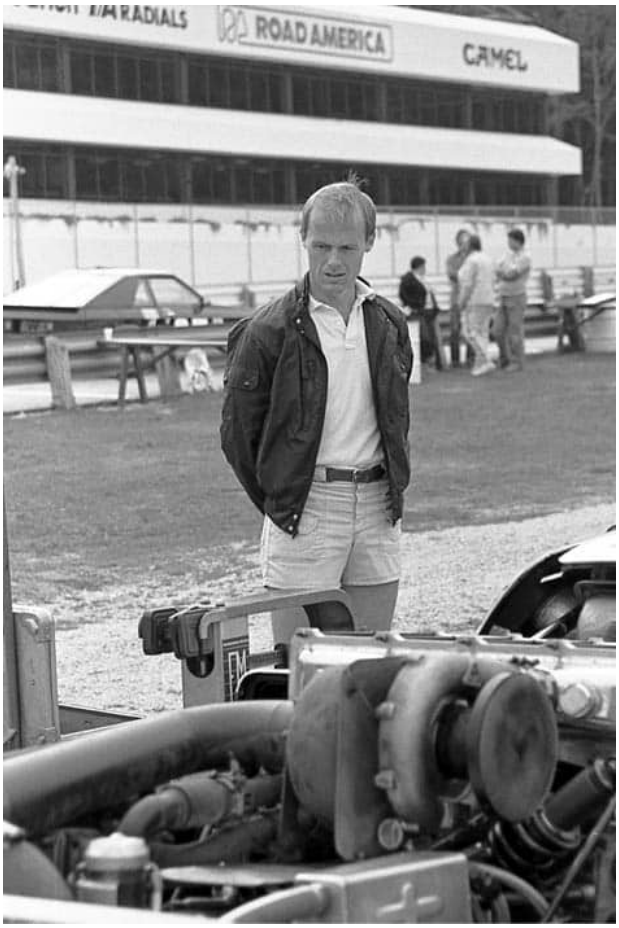
Portland Oregon: back-to-back testing. The HR1 in front, with the Porsche-supplied factory car, chassis 103, behind. (TS)

The 962 HR1 was powered by the single cam 3164cc, single KKK K36-4070 turbo engine Type 962/71 that followed on from the 935 design, pre-Andial, but by now weighed in at some 37lb (16.8kg) less than the 935/76 that had been installed in the 956. The 962/71 engine in the Holbert cars put out around 720bhp.

On 4 August 1985 at the Sears Point 300km, Derek Bell/Al Holbert qualified 4th on the grid, and finished 7th overall. A couple of weeks later they dnf'd at Road America due to valve problems, but at Pocono 962 HR1 was on the front row and took victory. On 29 September at Watkins Glen the Holbert and Bell Show was 3rd on the grid, and – guess what? – they won again. Holbert was driving alone on 6 October at the Columbus 500km; he started from 3rd on the grid, but a driveshaft let him down and that was it. But in December at the famous Daytona Finale, the 3 Hours, Holbert had Al Unser sharing the driving, and starting from P3 on the grid; once more it was a clear victory to finish the year. Then came the big one: the 1986 Daytona 24 Hours: Holbert brought out his chassis 103 factory car for himself, Al Unser and Derek Bell to drive. Its engine was the same as in HR1. They won. HR1 came out again at the Miami Grand Prix, finishing 6th overall with Derek Bell as the partner driver. Throughout 1986, the 962 Holbert-built HR1 won on four occasions, was 2nd twice, 3rd once, 4th twice, 6th twice, and experienced two dnfs during the season. Al Holbert won the 1986 IMSA GTP Championship. It is said that Al Holbert was a master of perfection and kept notes of everything; he created his own data forms to keep the records of every run, and he even kept a pen and notepad in the cockpit of his cars when driving, writing down details as soon as he came to a halt in the pits. Interestingly, though not to the delight of Norbert Singer, Holbert had started experimenting with a raised front wing, exactly as Richard Lloyd had done on his 956.

Holbert's second car, the 962 HR2, was again an in-house effort, being built for Bruce Leven's Bayside Disposal team. The front wing arrangement continued into 1987, where the front end was further streamlined, as we can see in the picture opposite, from Columbus, Ohio. A new engine, too, was installed for 1987: the 962/72. The 962/72 engine of 3-litre was created to meet the rules imposed by

IMSA which allowed twin plugs, so teams turned to the old 935 unit that had twin-plug cylinder heads. This, on an Andial engine with a new Motronic ignition system, proved pretty handy, with two victories and two 2nd places as best results. IMSA had hoped to slow the 962s down!



Al Holbert studies one of his cars at Road America, April 1986. Note the high-mounted intercooler and turbo; hence the air intake above the rear cover of the Holbert cars of the time. (MS)

Mid-Ohio 1986: the new wing arrangement (similar to that employed on the Richard Lloyd car in Europe) for the Holbert/Bell 962 HR1. They took victory, but did the wing help? As far as Porsche was concerned, the jury was out on that one. (MW)

Sears Point 1986: Paolo Barilla/Bob Wollek in the Bruce Leven Bayside Disposal-entered 962 Holbert HR2. (MW)

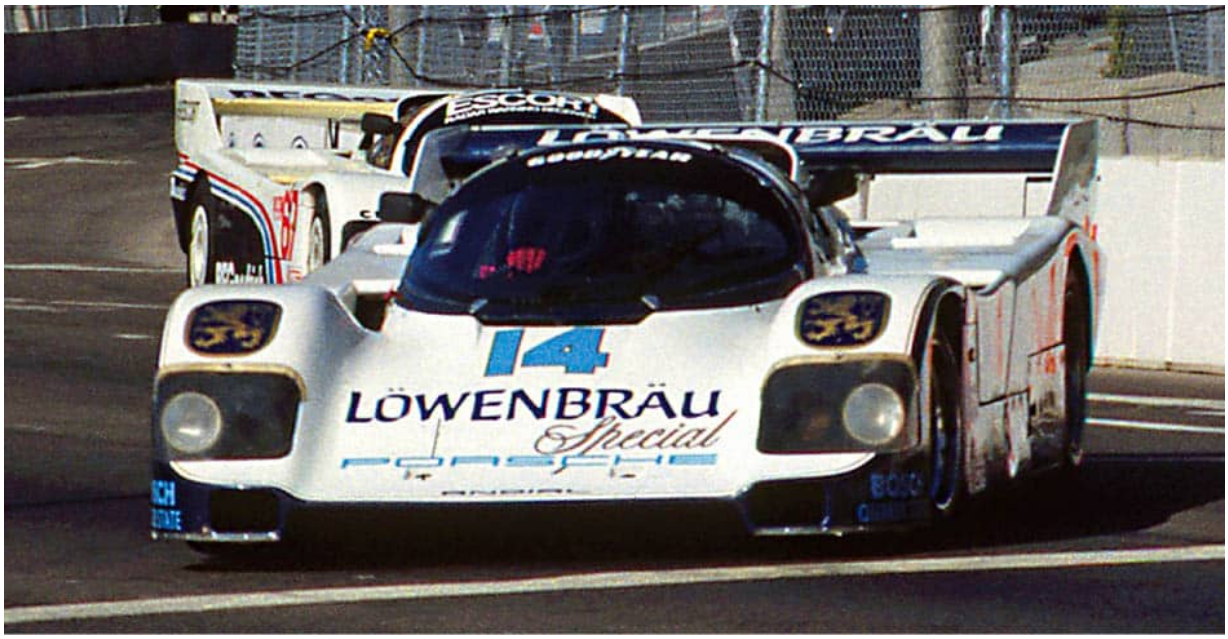
For 1987 the wing arrangement was changed to a more streamlined front end, first seen at Road Atlanta on 4 April, where HR1 finished 2nd. The engine in this car was now a 962/72 2994cc: still single-cam, single-turbo, but with twin-plug ignition. Here we see the car at Columbus, Ohio, where Holbert, driving alone, finished 5th. (MW)

Holbert started building more cars, but now with chassis monocoques created by outside companies. Dave Klym at Fabcar told the author that it did three for Holbert Racing, and Jim Chapman, of Jim Chapman Developments, advised he did two for Holbert Racing as well. Holbert built up HR1 to HR7 962 cars. The 1987 IMSA GTP Championship had 962s filling the top seven places – five of them Holbert-built cars! In 1988, the same Porsche engine type was in use, but a new sponsor had come along – Miller Beer.

Of the seven Holbert Racing 962 race cars, only the first two were plain sheet aluminium tubs made in-house. The tubs by Fabcar and Jim Chapman Developments were aluminium honeycomb sandwich design.

The Holbert-built cars:

HR1: Used a Holbert-built tub; it was the Holbert Racing works car. 32 starts, 9 victories.



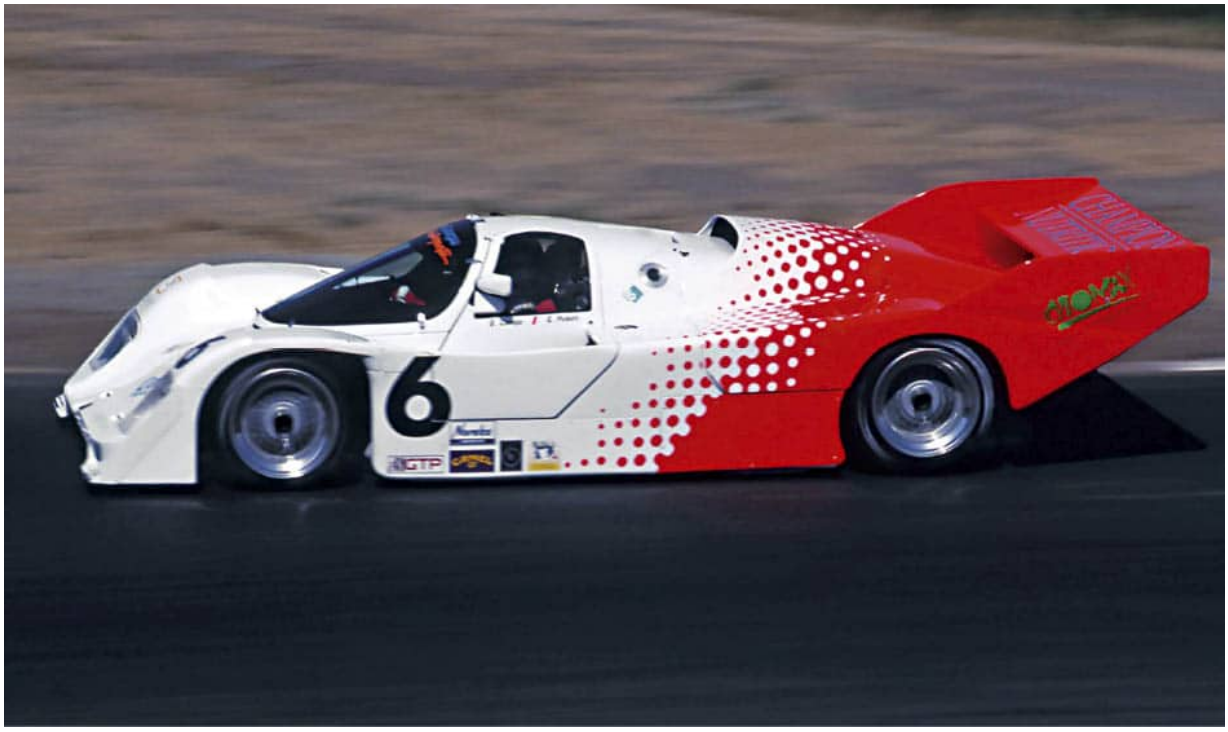
Columbus, 1985: HR1 3rd on the grid, but a dnf mars the day. Al Holbert driving. (MS)

The HR1 would appear in Miller High Life colours in 1988. The year started well, with the car qualifying on pole at the Sebring 12 Hours, but engine failure on lap 142 put paid to their run. (MW)

HR2: Used a Holbert built-tub and went to Bruce Leven, owner of the Bayside Disposal team. It ran with the front wing all the time it was at Bayside. First appeared at Riverside, 24 April 1986. 33 starts, 1 victory.

HR2 Holbert tub 962: single-turbo car for the Bruce Leven Bayside Disposal team, seen here at Sears Point in 1987. (MS)

HR2: here at Road Atlanta, being run by the Kalagian team. The man on the left is Doc Bundy, great friend and originally a pupil of Al Holbert; Doc was to become one of the USA's legendary racing drivers. (MW)



1989, Sears Point: HR2, with Bruce Canepa/Greg Pickett. 3-litre engine, 13th grid, 15th overall. (MW)

HR3: Fabcar honeycomb chassis tub: numbered HR3F, it went to the team run by John Hotchkiss. However, like many race cars, HR3 was involved in an accident in 1987, necessitating a replacement. It was disassembled and set aside, and not repaired until 1989, when, with a new monocoque, it became HR5. Reconstructed, the car reappeared at the Daytona 24 Hours in 1990. It came home 3rd at Daytona in 1991. In total, the Hotchkiss cars made 29 starts (original plus the repaired car). No victories.

The HR3F in 1987, still in one piece for the moment. (MS)

HR4: Fabcar chassis.

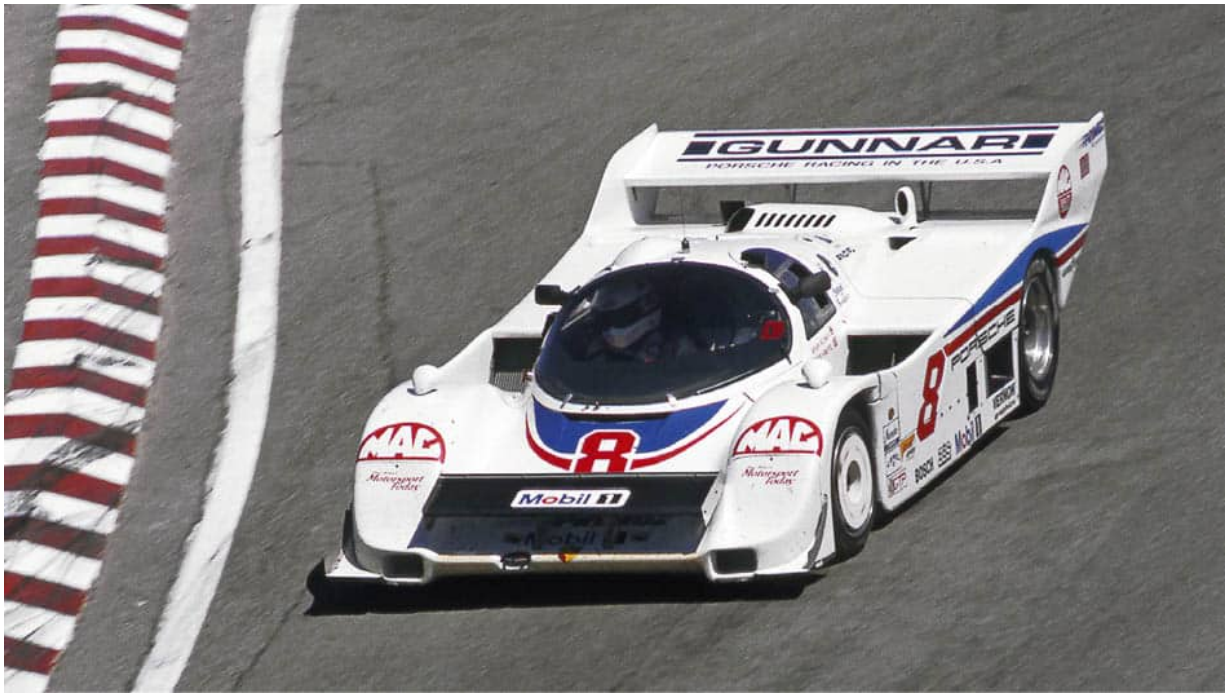
HR4 also utilised a Fabcar Dave Klym chassis tub, and was scheduled for AJ Foyt; it made 8 starts – again, no victories. (MW)

Sebring 1988: Hurley Haywood in the foreground. (MW)

HR5: Chassis tub, replacement for the HR3.

1989 Road Atlanta: the Wynn's car was rebuilt after its earlier accident in its previous life as HR3. (MW)

HR6: Porsche Germany factory chassis 962-123, podiums but no victories. This chassis was created as a spare/replacement, and supplied by Porsche Germany to Porsche North America, where Al Holbert was at that time Porsche North America Motorsport supremo. The chassis went to Holbert Racing, was built into a car and supplied to Primus Racing. Contrary to previous records in other works, this is the chassis 123 acquired by Vern Schuppan from Primus. The author has evidence from Michael Negline, who was handling the deal for Vern Schuppan, which inevitably involved lawyers. Categorically, it is this 962-123 that was acquired.



This car was created from factory chassis 962-123 that had been taken in-house at Holbert Racing to build into a complete car, which was then supplied to Primus Racing. Laguna Seca 1987: Chris Kneifel/Brian Redman were 5th on the grid and 19th overall. The car was later acquired by Vern Schuppan. (MW)

HR7: Jim Chapman chassis tub: podiums but no victories.

HR7, 10 April 1988, Road Atlanta 500km: HR7 utilised a tub built by Jim Chapman. Carrying Miller livery, it would be driven by Robinson/Bell. 2nd on the grid, they would finish 3rd overall. (MW)

Here is a selection of how the Holbert-built 962s fared (note: this is not definitive, but a demonstration of the performances):

28/6/85	300km Portland	Holbert	HR1	Pole, 1st ov
2/8/85	300km Sears Point	Holbert/Bell	HR1	4th grid, 7th ov
25/8/85	Road America 500 Miles	Holbert/Bell	HR1	5th grid, dnf
8/9/85	Pocono 500km	Holbert/Bell	HR1	2nd grid, 1st ov
29/9/85	Watkins Glen 500km	Holbert/Bell	HR1	3rd grid, 1st ov
6/10/85	Columbus 500km	Holbert	HR1	3rd grid, dnf
1/12/85	Daytona 3 Hours	Holbert/Unser	HR1	3rd grid, 1st ov
2/3/86	Miami Grand Prix	Holbert/Bell	HR1	4th grid, 6th ov
6/4/86	Road Atlanta 500km	Holbert/Bell	HR1	2nd grid, 3rd ov
27/4/86	Riverside 6 Hours	Holbert/Bell	HR1	4th grid, dnf
4/5/86	Laguna Seca 300km	Holbert	HR1	2nd grid, 4th ov
4/5/86	Laguna Seca 300km	Leven/Adam	HR2	10th grid, 14th ov

18/5/86	Charlotte 500km	Holbert/Bell	HR1	3rd grid, dnf
26/5/86	Lime Rock 150 laps	Holbert	HR1	5th grid, 1st ov
26/5/86	Lime Rock 150 laps	Wollek/Barilla	HR2	3rd grid, 6th ov
8/6/86	Mid-Ohio 500	Holbert/Bell	HR1	2nd grid, 1st ov
22/6/86	West Palm Beach 3 Hours	Holbert/Bell	HR1	8th grid, 4th ov
22/6/86	West Palm Beach 3 Hours	Wollek/Barilla	HR2	6th grid, 17th ov
6/7/86	Watkins Glen 500 Miles	Hotchkiss/Adams	HR3	13th grid, 8th ov
6/7/86	Watkins Glen 500 Miles	Wollek/Barilla	HR2	5th grid, dnf
27/7/86	Portland 300km	Holbert	HR1	5th grid, 1st ov
27/7/86	Portland 300km	Leven/Barilla	HR2	16th grid, 13th ov
3/8/86	Sears Point 300km	Holbert/Bell	HR1	8th grid, 5th ov
3/8/86	Sears Point 300km	Barilla/Wollek	HR2	Pole, 6th ov

24/8/86	Road America 500km	Hotchkiss/Adams	HR3	14th grid, dnf
21/9/86	Watkins Glen 500km	Hotchkiss/Adams	HR3	10th grid, 6th ov
21/9/86	Watkins Glen 500km	Holbert/Bell	HR1	4th grid, 2nd ov
5/10/86	Columbus 500km	Hotchkiss/Adams	HR3	17th grid, 7th ov
5/10/86	Columbus 500km	Wollek/Pruett	HR2	12th grid, 1st ov
26/10/86	Daytona 3 Hours	Hotchkiss/Adams	HR3	11th grid, dnf
26/10/86	Daytona 3 Hours	Holbert/Bell	HR1	6th grid, 4th ov
1/2/87	Daytona 24 Hours	Foyt/Sullivan	HR4	8th grid, dnf
1/2/87	Daytona 24 Hours	Redman/Kneifel/ Forbes-Robinson	HR6	6th grid, dnf
1/2/87	Daytona 24 Hours	Hotchkiss/Adams	HR3	5th grid, 5th ov
1/3/87	Miami 3 Hours	Foyt/Sullivan	HR4	11th grid, 6th ov
1/3/87	Miami 3 Hours	Redman/Kneifel	HR6	16th grid, 8th ov

21/3/87	Sebring 12 Hours	Foyt/Sullivan/ Haywood	HR4	7th grid, dnf
21/3/87	Sebring 12 Hours	Redman/Kneifel/ Forbes-Robinson	HR6	6th grid, 3rd ov
21/3/87	Sebring 12 Hours	Holbert/Robinson	HR1	Pole, dnf
12/4/87	Road Atlanta 500km	Holbert/Robinson	HR1	3rd grid, 2nd ov
12/4/87	Road Atlanta 500km	Redman/Kneifel	HR6	8th grid, 5th ov
26/4/87	Riverside 500km	Holbert/Robinson	HR1	3rd grid, 2nd ov
26/4/87	Riverside 500km	Redman/Kneifel	HR6	6th grid, dnf
26/4/87	Riverside 500km	Adams/Hotchkiss	HR3	5th grid, 5th ov
3/5/87	Laguna Seca 300km	Leven	HR2	12th grid, 8th ov
3/5/87	Laguna Seca 300km	Redman/Kneifel	HR6	15th grid, dnf
24/5/87	Lime Rock 150 Laps	Robinson	HR1	Pole, dnf
7/6/87	Mid-Ohio 500km	Holbert/Robinson	HR1	2nd grid, 4th ov
7/6/87	Mid-Ohio 500km	Adams/Hotchkiss	HR3	8th grid, dnf
21/6/87	West Palm Beach 3 Hours	Foyt/Jones	HR4	11th grid, 4th ov
5/7/87	Watkins Glen 500km	Holbert/Robinson	HR1	2nd grid, dnf
5/7/87	Watkins Glen 500km	Adams/Hotchkiss	HR3	5th grid, 2nd ov
26/7/87	Portland 300km	Leven	HR2	10th grid, 8th ov
2/8/87	Sears Point 300km	Leven/Haywood	HR2	18th grid, 5th ov
2/8/87	Sears Point 300km	Adams/Hotchkiss	HR3	7th grid, 4th ov
16/8/87	Road America 500 Miles	Bell	HR1	5th grid, 4th ov
16/8/87	Road America 500 Miles	Hotchkiss/Adams	HR3	8th grid, 6th ov
6/9/87	San Antonio 3 Hours	Bell/Robinson	HR1	3rd grid, 1st ov
27/9/87	Fuji 1000km	Bell/Brabham	HR6	14th grid, 6th ov
4/10/87	Columbus 300km	Holbert	HR1	6th grid, 5th ov

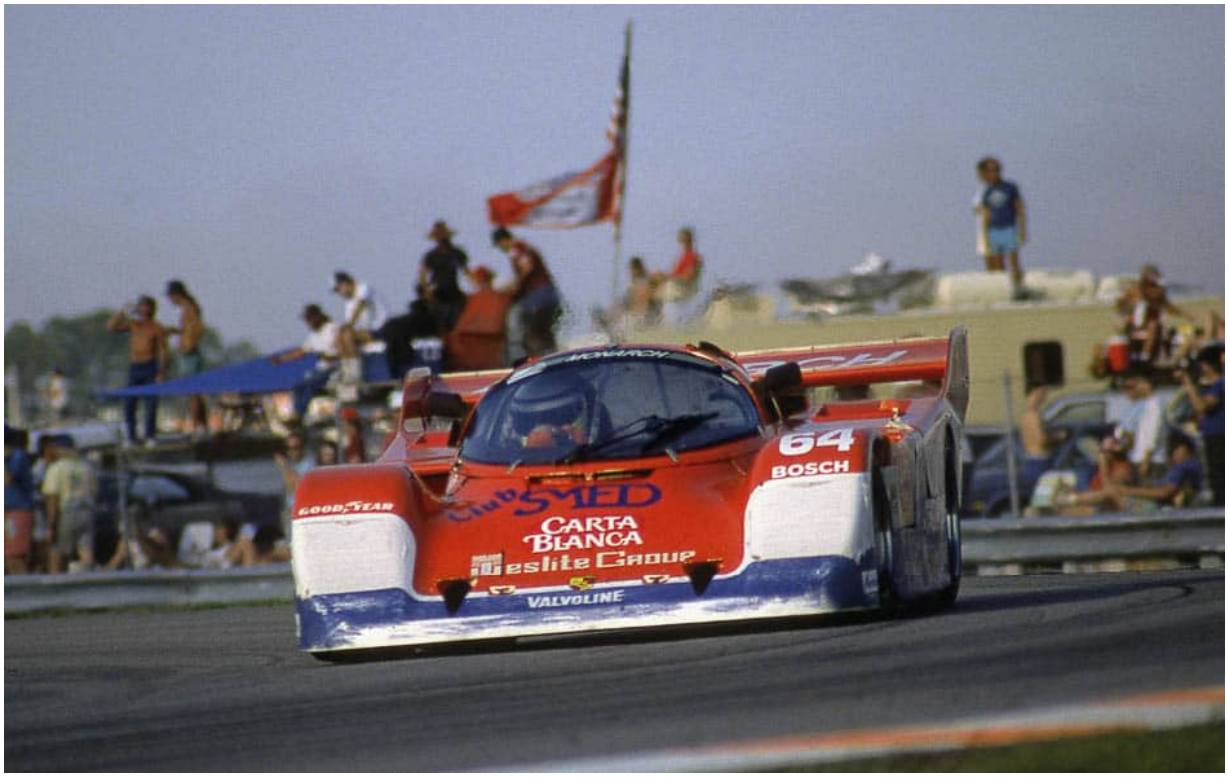
4/10/87	Columbus 300km	Mass	HR 2	5th grid, 2nd ov
25/10/87	Del Mar 2 Hours	Rahal	HR2	4th grid, 3rd ov
25/10/87	Del Mar 2 Hours	Robinson	HR1	Pole, dnf
29/11/87	Fuji 500km	Brabham/Elgh	HR6	6th grid, 2nd ov
31/1/88	Daytona 24 Hours	Foyt/Unser/Forbes-Robinson	HR4	9th grid, 6th ov
31/1/88	Daytona 24 Hours	Holbert/Robinson/ Bell	HR1	8th grid, dnf
31/1/88	Daytona 24 Hours	Rothbarth/Jourdain/ Jourdain/Stevens	HR2	12th grid, 5th ov
28/2/88	Miami 3 Hours	Foyt/Dyson	HR4	5th grid, 7th ov
28/2/88	Miami 3 Hours	Rothbarth/Jourdain	HR2	17th grid, dnf
28/2/88	Miami 3 Hours	Bell/Robinson	HR1	4th grid, 4th ov
3/3/88	Fuji 500km	Elgh/Sala	HR6	6th grid, 4th ov
19/3/88	Sebring 12 Hours	Holbert/Robinson	HR1	Pole, dnf
19/3/88	Sebring 12 Hours	Foyt/Haywood	HR4	7th grid, 4th ov
19/3/88	Sebring 12 Hours	Hotchkiss/Adams/ Hotchkiss Jr	HR3	8th grid, 5th ov
19/3/88	Sebring 12 Hours	Rothbarth/Jourdain	HR2	10th grid, dnf
10/4/88	Road Atlanta 500km	Robinson/Bell	HR7	2nd grid, 3rd ov
10/4/88	Road Atlanta 500km	Bundy/Rothbarth	HR2	12th grid, 7th ov
24/4/88	West Palm Beach 3 Hours	Rothbarth/Jourdain	HR2	15th grid, 6th ov
24/4/88	West Palm Beach 3 Hours	Robinson/Bell	HR7	5th grid, dnf
24/4/88	West Palm Beach 3 Hours	Foyt	HR4	11th grid, dnf
5/6/88	Mid-Ohio 500km	Robinson/Bell	HR7	5th grid, 6th ov
5/6/88	Mid-Ohio 500km	Bundy/Stevens	HR2	13th grid, 19th ov
10/4/88	Suzuka 500km	Elgh/Sala	HR6	5th grid, 1st ov

30/5/88	Lime Rock 150 Laps	Jourdain/Rothbarth	HR2	10th grid, 8th ov
30/5/88	Lime Rock 150 Laps	Robinson	HR7	3rd grid, 4th ov
3/7/88	Watkins Glen 500km	Robinson/Bell	HR7	2nd grid, 2nd ov
3/7/88	Watkins Glen 500km	Bundy/Graham	HR2	9th grid, 8th ov
24/7/88	Fuji 500km	Elgh/Sala	HR6	2nd grid, dnf
17/7/88	Road America 500km	Bell/Robinson	HR7	9th grid, 2nd ov
17/7/88	Road America 500km	Jourdain/Graham	HR2	8th grid, 9th ov
31/7/88	Portland 300km	Robinson	HR7	8th grid, 18th ov
31/7/88	Portland 300km	Jourdain/Graham	HR2	15th grid, 9th ov
14/8/88	Sears Point 300km	Robinson/Bell	HR7	9th grid, 6th ov
14/8/88	Sears Point 300km	Bundy/Graham	HR2	12th grid, 12th ov
28/8/88	Suzuka 1000km	Elgh/Sala	HR6	11th grid, 7th ov
4/9/88	San Antonio 3 Hours	Bell/Robinson	HR7	8th grid, dnf

4/9/88	San Antonio 3 Hours	Bundy/Graham	HR2	17th grid, 5th ov
2/10/88	Columbus 3 Hours	Jourdain/Graham	HR2	13th grid, 11th ov
9/10/88	Fuji 1000km	Elgh/Sala	HR6	14th grid, 7th ov
23/10/88	Del Mar 2 Hours	Jourdain/Graham	HR2	24th grid, 15th ov
5/2/89	Daytona 24 Hours	Andretti/Andretti	HR7	9th grid, dnf
5/2/89	Daytona 24 Hours	Jourdain/Manautou/ Berg/Contreras	HR2	11th grid, dnf
4/2/90	Daytona 24 Hours	Hotchkiss/Adams/ Hotchkiss Jr	HR3	15th grid, 6th ov
17/3/90	Sebring 12 Hours	Hotchkiss/Adams/ Hotchkiss Jr	HR3	14th grid, 4th ov
15/7/90	Sears Point 300km	Canepa	HR2	17th grid, dnf
3/2/91	Daytona 24 Hours	Cord/Hotchkiss/ Adams/Dyson	HR3	12th grid, 3rd ov

The Jochen Mass 962 HR2: 5th on the grid, 2nd overall at Columbus, Ohio, 1987. (MW)

HR2 1988: Doc Bundy/Rob Stevens, the Kalagian team with Minolta sponsorship at Mid-Ohio, 19th overall. (MW)



HR2, now under the wing of the Bernard Jourdain team, here at Daytona 1989, qualified 11th but didn't make it to the end. (MW)

Several of the Holbert cars, of course, moved on to new owners: HR2 is a perfect example. Built originally for Bruce Leven, it would move on to John Kalagian, who ran Kalagian Racing. He had previously run a March Porsche that subsequently found its way to England and the Richard Cleare team (see the March-Porsche section). Kalagian ran the 962 before moving it on to Bernard Jourdain.

Unfortunately, the Holbert Racing story has a sad ending. A tragedy was to occur on 30 September 1988. Al Holbert, who not only ran the Holbert family company, but was also the head of Porsche Motorsport in the USA, was a man who flew everywhere, he was an accomplished pilot and a very busy man. Flying out after practice from Columbus, Ohio, his plane crashed shortly after take-off from Columbus airport. His death would have a catastrophic effect on racing. The SCCA withdrew the No 14 as a mark of respect. His great friend and many times driver for the team, Doc Bundy, told the

author: “The accident was because of the airplane itself, in my opinion. It was an Aerostar, a very fast twin engine – that was why he liked it! I didn’t: the only door was on the left (pilot’s side); it was a clam-shell type door and sealed in the middle. Sitting in the pilot’s seat, you could even touch the prop on the left engine! On that fateful day, Al was alone in the plane. On take-off, the door popped open; he called in to the control tower to say he was having a problem. But that was all that was said. The plane stalled in its climb, then went into a spin and flew straight down into the earth. He really was the nicest guy you could wish to meet.”

Before the fatal plane crash, Al Holbert had been a champion many times, including the all-time IMSA Camel GT victories (49), the lead man in the USA Porsche 962 effort, three wins at Le Mans, five IMSA titles, and had raced in NASCAR and at the Indianapolis 500.

The sad sight that greeted race goers on race day at Columbus Ohio on 1 October 1988. Photographer Mark Windecker, who supplied many images for this work, was there. RIP, Al. (MW)

♦ ♦ ♦ ♦ ♦

John Paul Racing-Porsches

John Lee Paul Snr had started racing in the 1960s, thought to be in a Porsche 550 RS Spyder. Son of a Dutch immigrant, he grew up to be an extremely successful fund manager in the USA, which of course saw to the running costs of racing, as he grew to be a millionaire. He successfully raced a Chevrolet Corvette in the late 1960s, and in 1977 a 911 RSR, driving alongside of John O'Steen and Bob Hagestad at Daytona and Sebring; he went on to win the IMSA Drivers' Championship. On 11 June 1978, John Paul Snr was on the driving team with Brian Redman and Dick Barbour in the 935/77a that finished 5th overall, and won the IMSA class at the Le Mans 24 Hours.

Funding was not a problem at this stage. He acquired a 930 Porsche from, it is thought, the Ted Field Interscope team, and created the JLP1; it would be powered by the 930 engine 930/72. It would race throughout 1979, taking six victories and winning the TransAm title. At some stage in 1979, the John Paul family ran into difficulties with the law, which became the basis of a series of problems through the 1980s. Their history is well documented elsewhere, and not a subject for this work. Our purpose is served by the technology of some of the cars, and it is solely in that area that we are interested. Both were accomplished drivers, and although JLP1 is stated as being destroyed in a last-lap accident at the Daytona Finale in 1979, it is recorded as finishing 4th overall.

Le Mans 1978: the Dick Barbour 935-930 2992cc-powered car. John Paul joined Brian Redman and Dick Barbour to finish 5th overall; it had a near-faultless run with 25 pit stops, and only one 'moment' when Barbour spun at marshals' post 18 at around 08.45h on the Sunday morning. (PK)

Funding was not a problem at this stage. The JLP1 (John Lee Paul) would be powered by the 930 engine 930/72. It would race throughout 1979, taking six victories and winning the TransAm title. (MW)

JLP2 was created over the winter of 1979/80, when it was decided that the JLP1 could not be repaired. Based on the JLP1, it was created from a chassis bought from the factory, 009 0043; the John Pauls built it to a similar spec to the Kremer K3s. It would have the 930/80 3.2-litre single-turbo engine, putting out over 720bhp, as opposed to the 930/72s engine with 600bhp. The car is listed in many records as a Kremer chassis, but in fact, as Achim Stroth (Kremer), told the author: “John Paul Racing only bought a few body/suspension kits from Kremer. Kremer never sold any tube-frame chassis. The car had Kremer bodywork with Kremer suspension and all the build work done in the USA.”

The JLP2 was raced from 1980 to 1986, first by John Paul Snr to the end of 1980. Then there was a period when the US authorities decided to re-home him for a while, and through the 1981 season it was John Paul Jr and others who drove, before the car was sold to Marty Speer for a full season of racing through 1982 and 1983. JLP2 enjoyed only one victory in its career, on 31 August 1980 in the Road

America 500 Miles, though other podium finishes were frequent before the car became obsolete. JLP3 was the next model; it was similar visually to JLP2, but this time it would have a tube-frame chassis and the required legal parts of the roof and cockpit area from an original Porsche. In this case, it is said these parts (those required by the regulations) were from an old 1972 911 T, and built up at the premises of Chuck Gaa's GAACO organisation; we will hear more of GAACO in a moment. Lee Dykstra had a hand in the design; Graham Bartrills is credited with building the car, the power unit being the 930/80. It was to be a successful car, with many victories, driven by John Paul Snr who, having returned to the world and racing, was to win the IMSA Drivers' Championship in 1982. The car was also to win the big one on 31 January 1982: victory at the Daytona 24 Hours – 719 laps, 11 laps clear of the runner-up, the 935 K3 of the Bob Akin entry.

The race record of this car is worth noting: in 1981 it was to win at Pocono and at the Daytona Finale. It was 2nd overall at the Riverside 6 Hours, Laguna Seca and Lime Rock, with a 3rd podium place at Brainerd and the Daytona Finale. In 1982 it was to win at the Daytona 24 Hours, the Sebring 12 Hours, Road Atlanta (twice), the Riverside 6 Hours, Charlotte and Mosport, and 2nd at Road America and Pocono. A remarkable run of results.

K3 Kremer-inspired Porsche: JLP2 racing at the Le Mans 1980; Guy Edwards would join the Pauls to finish 9th overall and 2nd in the IMSA class. (AJFR)

The JLP3 appeared in a number of liveries as various sponsors came and went. However, if the JLP3 was the car to beat, what came next was hoped to be a giant killer, but its technology, though up there, wasn't perfected, and so the new JLP4 never achieved the dizzy heights of the JLP3. We will return to the final Jean Paul car, the JLP4, in a moment when we pick up the story of the Fabcar Company. Next, we look at another special.

The Road America 500, 23 August 1981: pole position for the JLP3, GAACO-built, John Paul-driven car, which petered out to nil when the engine failure visible here caused a dnf. (MW)

Victory Lane 1982: Rolf Stommelen, John Paul Snr and John Paul Jr would take the No 18 935 JLP3 to overall victory. (P)

JLP3 1982: the Road Atlanta Sprite 500 Miles. Driven by John Paul Jr, it would start from 4th on the grid to take yet another victory. (MS)

♦ ♦ ♦ ♦ ♦

Brumos-Porsche: the 1980 Jack Atkinson 935

The well-known Porsche company, Brumos, created by Peter Gregg in the 1960s, was always to turn out great cars. Mostly it stuck to the Porsche design ideals, as the cars came from the factory, Hurley Haywood told the author. But also Brumos was not beyond doing a few tweaks, as we have already seen with the RSR. Jack Atkinson was in charge of the Brumos competition department, and he had much influence on the race cars, as we could see in the late 1970s, when several 935s with extras arrived. This 935, created initially for Peter Gregg in 1980, had started life as chassis 00024. It went to Brumos, where Atkinson created the final incarnation. It would race in 1980 at the Sebring 12 Hours, with Gregg/Haywood and Leven on board, to finish 10th overall; at Riverside in 1980 it was 3rd, but finished down the field at Mosport and dnf'd at Road America.

Following Peter Gregg's untimely passing in December 1980 by his own hand, the car was moved on to Bruce Leven for 1981. It raced

at Daytona with Bruce Leven/Hurley Haywood/Jürgen Barth, but it was not classified. However, its best result was just around the corner. At the Sebring 12 Hours of 1981, Bruce Leven/Al Holbert/Hurley Haywood took a well-deserved victory, taking the lead in the final hour, after suffering a number of early race problems. The 935-00024 continued to race five more times before being crashed in practice at Sears Point, and burnt out.

The 'special' car built up at Brumos by Jack Atkinson for Peter Gregg. Following Gregg's death in December 1980, the car was acquired by Bruce Leven, and raced under the Bayside Disposal brand by Leven and Hurley Haywood. (JS)

Totally revised for 1981, the Atkinson Brumos 935 00024 at the Sebring 12 Hours. Bruce Leven/Al Holbert/Hurley Haywood took a well deserved victory, taking the lead in the final hour. (MW)

♦ ♦ ♦ ♦ ♦

GAACO-Porsche

As we saw, Chuck Gaa's team, and Graham 'Rabbit' Bartrills especially, had created the JLP3 with Lee Dykstra for Bob Akin Racing. Now Chuck Gaa would come up with a new car, entitled a 935L1 – not a tube-frame car but a bonded monocoque chassis example: a completely different way of thinking to create a new version of the 935. The design offered high torsional stiffness coupled with low weight, based upon an idea that came from the Lola T600. The roof and cabin area from a crashed 911 were incorporated to comply with the regulations for the use of original Porsche-pattern parts. The engine was the regular 930/80 which, along with the transmission, came from Stuttgart. The rear suspension was the creation of GAACO. The long nose of the car (so the author was told) followed the idea of the Lola T600 snout, with the huge air outlet at the top. The aerodynamics of the car drew air into the rear of the car to aid cooling and supply air to the engine intake via the turbo. It

had made its debut at the Coca Cola 500 on the Lime Rock circuit. In a straight line it was very fast, but had to be handled with care in the corners! There was work to do, but nevertheless it was entered for the 1982 Le Mans 24 Hours, in the GTX IMSA class, to be driven by Bob Akin/David Cowart/Kemper Miller; they were 31st on the grid with a time of 3min 52.31sec – this in a car that had only run once and was virtually a home-built special! It looked promising. Sadly, someone had miscalculated the fuel loads and consumption (as we have seen, they were not the first to do this at Le Mans); the car stopped, out of fuel, on lap 15.

Two top drivers took a turn in races in the USA: Derek Bell and Hurley Haywood, but only a 4th place by Haywood got the radical design near to the podium at Mid-Ohio 6 Hours. However, Derek Bell is recorded as saying it was the worst car he ever drove! The futuristic project came to a sticky end at the Daytona Finale meeting during practice whilst negotiating the Daytona banking. It was later rebuilt by Canadian Jacques Rivard, but wasn't to go big-time racing again. Others at the time continued with tube-frame cars, which brings us now to look at another chassis builder – one at the top of the tree. We will now look at the early cars of Dave Klym and the Fabcar organisation.

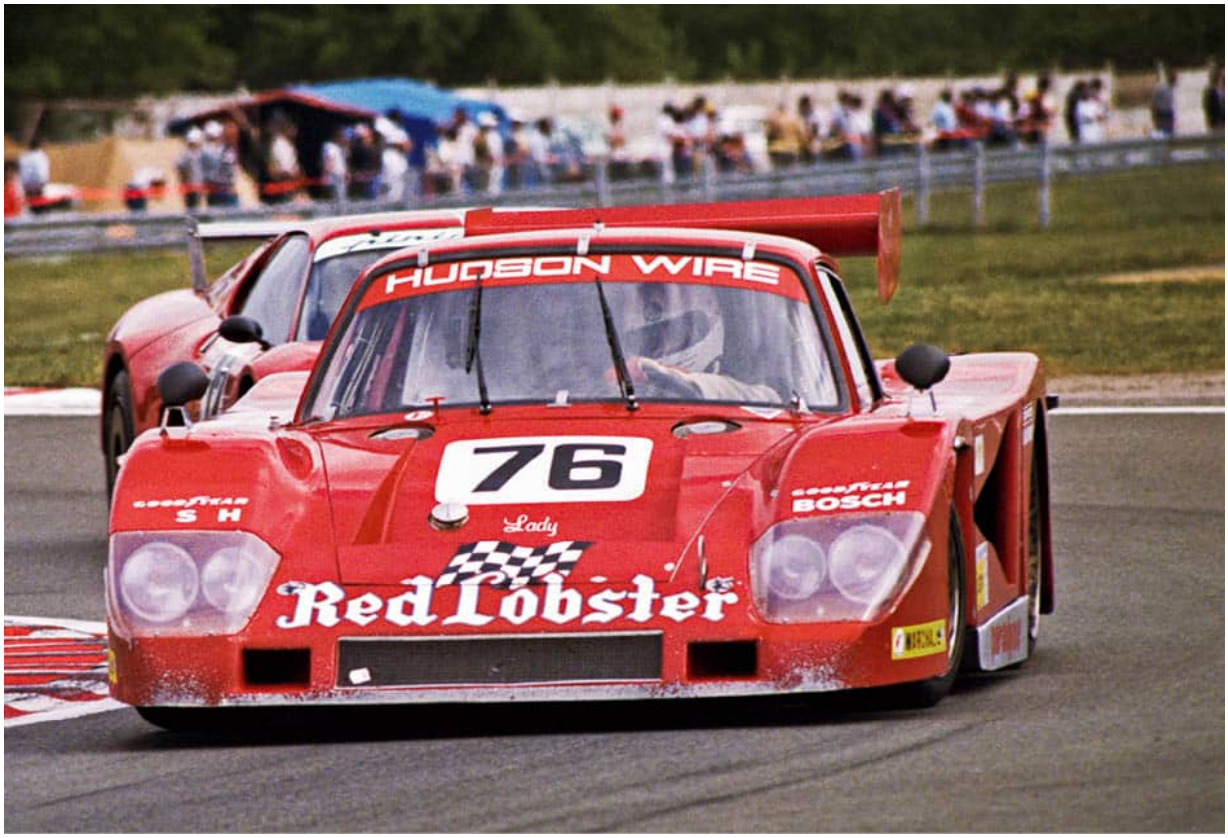
Twice outright winner in 1982: the very quick GAACO-created 935 JLP3, here at the Daytona 24 Hours. (P)

The extremely quick JLP3; John Paul Jr and John Paul Snr followed up the Daytona win with a victory at the 1982 Sebring 12 Hours. (P)

The interesting 935 L1 monocoque, the GAACO team car, inspired by the K4 Kremer car and the Lola T600, ready to run at Road Atlanta 1982. (MS)

935 LT1 – a Lola T600-inspired long-nose, lightweight body covers the bonded monocoque chassis created by Team GAACO's 'Rabbit' Bartrills, designed by Lee Dykstra. (JS)

Road Atlanta: the 500km Camel endurance race: Derek Bell/Bob Akin took pole position and finished 7th overall. (MS)



Le Mans 1982: the GAACO Akin 935L of Bob Akin/David Cowart/Kemper Miller were 31st on the grid with a time of 3min 52.31sec – this in a car that had only run once, and was virtually a home-built special! It looked promising. Sadly, yet again someone had miscalculated the fuel loads and consumption. (They were not the first to do this at Le Mans: see the item in this chapter about the Grid car. The author also recalls the Renault Elf team doing the same in 1975 with the Alpine A441 Elf.) The 935L stopped, out of fuel, on lap 15. (P)

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Fabcar-Porsche – Part 1

Fabcar – this is a name the reader will already have seen several times. It is a company that deserves to be here, not just as a components or chassis manufacturer, but as a creator of some of the finest racing Porsche-powered cars. Here in Part 1 we look at Fabcar in the 1980s. There would be three more decades of cars,

and it's not done yet. Although owner Dave Klym is retired, he still owns the company at the time of writing, and the management are doing a fine job.

Dave Klym and his wife set up Fabcar in 1977. In 1979, Fabcar was contracted by Lindsay Hopkins from Atlanta to build three Lightning Indy cars. These cars were some of the first ground-effect Indy racers, designed by David Bruns and featuring an aluminium monocoque chassis and unique pushrod/pull-rod suspension. Dave Klym moved Fabcar to Atlanta, Georgia, in 1980 concentrating on sports cars, and became involved with Porsche, and extensively modified the suspension of a factory-supplied 924 for Paul Miller Racing. (We will see more of Paul Miller Racing later.) Dave, with Lee Dykstra and Dave Bruns, created tube-frame 924s and 944s that became some of the fastest in the business. Dave Klym's organisation was also building special Porsche-powered cars, the tube-frame chassis 935s for John Paul and Bob Akin. In 1981 Fabcar had been approached to see if it could build a special 935 for the aforementioned John Paul Snr. Cost did not come into it, and, so long as JLP paid his invoices, Fabcar would be happy to build a car. Porsche, of course, had ceased production of the 935, and Kremer was only supplying parts and bodies. The Pauls knew the 935 was getting long in the tooth; they wanted something with new technology; they had had great success with the JLP3. They got the technology they were looking for in a blindingly fast car. Of course, as already mentioned earlier, the regulations called for the roof and cockpit area to be a standard component, so that had to come from a production car. The 935 JLP4 would be Fabcar's first 935 version, and would be the Pauls' fourth bespoke 935.

Indianapolis 1979, Dave Klym: “The driver shown is Johnny Parsons Jr. I am in the gold Texaco jacket looking in the cockpit.” Roger Penske standing behind the car. (DK)

One of the first ground-effect cars to run at Indy. David Bruns (Swift Cars) designed it at Fabcar. (DK)

The Fabcar-built, Lee Dykstra-designed, ground-effect 935, said to be the fastest 935 ever built. It was crashed in testing at Road Atlanta, but rebuilt within weeks to race again. (DK)

A tube-frame chassis with monocoque parts designed in a similar way to the GAACO 935, but with Dave Klym's Fabcar expertise it pushed the boundaries of aerodynamics. (DK)

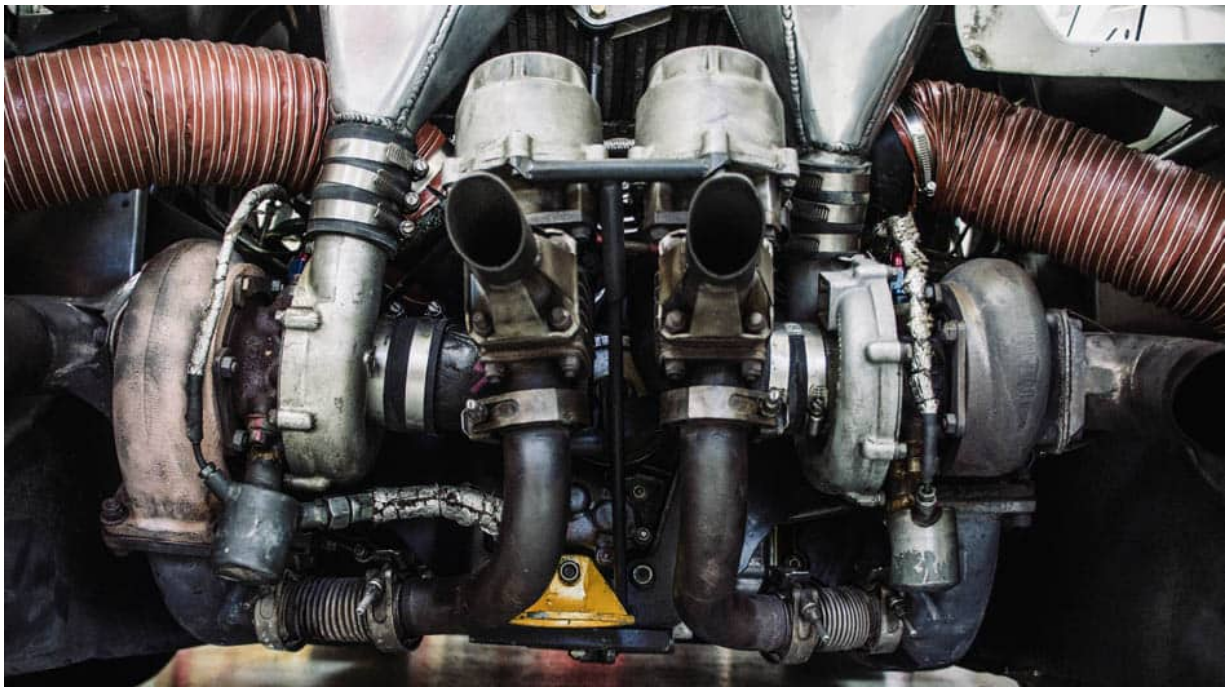
Ground-effect was the buzzword of the period. As we have seen, Norbert Singer had tried with the 'Moby Dick' 935 some years before. Klym's plan was to build a GTP car that would push the boundaries, incorporating the bare minimum components, and yet still keeping the layout of the production car for homologation purposes. Lee Dykstra was called upon to design some of the new 935. Already well known, he had been involved with the Akin monocoque car that featured in the GAACO section. The JLP4 would have a central-section tub with tube-frame extensions front and rear. Dykstra designed ground-effect tunnels under the car, with, at the front, rocker-actuated springs and shocks mounted in-board for clean airflow access for air passage through the tunnels. At the rear, double wishbones were connected to the trailing arms, with the springs mounted on top of the top wishbones. Ventilated disc brakes were fitted all round to stop the car when required.

Series regulations at the time did not permit a mid-engine layout, so Dave Klym's thinking was to move the engine as far forward as was possible, while maintaining stability. Fitted with the 930/80 3.2-litre all-aluminium engine, and with twin turbos, the power output of the Porsche would be around 840bhp. A four-speed gearbox was mounted upside down to accommodate a lower ride-height. Development leaned heavily on aerodynamics, fine tuned in extensive tests at the Lockheed wind-tunnel. Along the side of the car, slab-sided bodywork allowed vertically sliding skirts to be fitted, while a relatively narrow rear wing complied with the regulations.

The cost came out around three times as much as an 'off-the-shelf' 935 from Kremer or Joest. It would be July 1982 before the car was finally seen in action at Brainerd on 11 July 1982. Of the 30 cars entered, John Paul Jr qualified the car on the front row, won the race and set fastest lap. During testing at Road Atlanta, though, John Paul Snr had a huge accident that called for a total rebuild. The car ran again at the Daytona 3 Hours, but it is understood from reports that transmission failure led to its demise. The JLP4 raced once more in 1983, at the Road Atlanta 500 on 10 April, resulting in a 6th overall. The racing team was then folded as a consequence of the aforementioned extracurricular activities of the team owner. It is

believed the car still exists, now in Italy.

In 1984 Dave Klym was asked by Bob Akin to create a 935 along the lines of the previous car. As the reader will have seen, Akin had experimented with a GAACO 935 monocoque car in 1982. The Fabcar 935-84, closely resembling the K4 Kremer, even used the doors of the K4. This tube-frame car first appeared at the Daytona Finale on 27 November 1983, with John O'Steen joining Bob Akin to qualify 3rd on the grid and finish 2nd overall in the three-hour race. Through 1984 it would compete on seven occasions, starting with the Daytona 24 Hours, but achieved no podiums. Its next-best finish would be in 1985 at the Daytona 24 Hours with a new colour scheme; this time Jim Mullen/Kees Nierop/Ray McIntyre brought the Akin-owned car home in 5th overall from 20th on the grid.



Fitted with the 930/80 3.2-litre all-aluminium engine, and with twin turbos, the power output of the Porsche would be around 840bhp. A four-speed gearbox was mounted upside down to accommodate a lower ride-height. (DK)

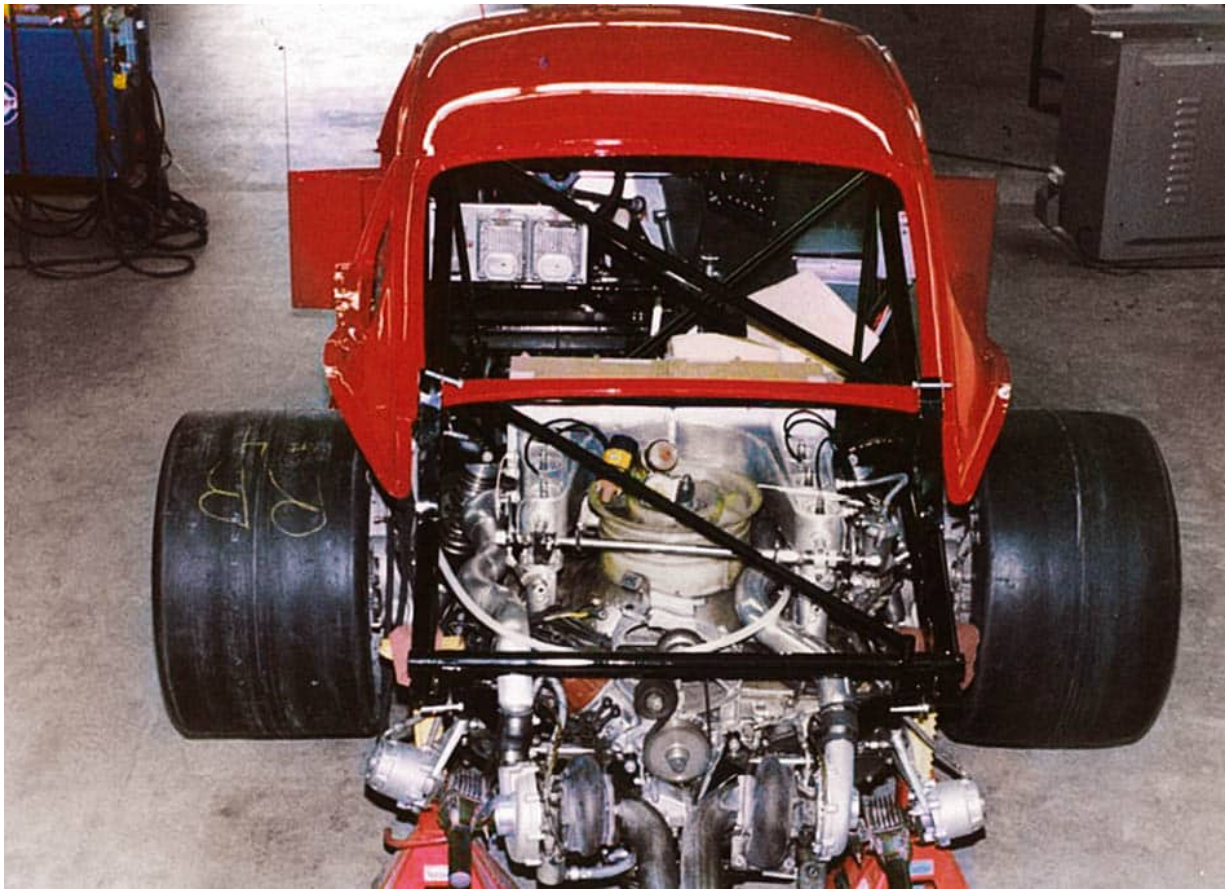
Lee Dykstra designed the car with ground-effect tunnels underneath, with, at the front, rocker-actuated springs and shocks mounted in-board for a clean airflow through the tunnels. (DK)

Klym's work in the late 1970s and early 1980s came to the attention of Al Holbert, for whom Fabcar started supplying parts, modifying cars, and was to go on to build 962 chassis for Holbert Racing. Fabcar built several more monocoques, not only for Holbert but for Rob Dyson and John Hotchkiss, as well as repairing factory monocoques worldwide. This, along with some work he had done for Joest, got the attention of the Porsche factory.

When Holbert became head of Porsche Motorsports in the USA in 1984, he had asked Fabcar to design and build a tube-frame 944 car (see more details later). Fabcar went on to build seven of the front-engine TransAm cars.

In 1984 Dave Klym wanted to build an IMSA GTP Lights car. It would be powered by Porsche, of course. Tom Winters, in the form of Whitehall Motorsports, was to be heavily involved. Both Tom and Elliott Forbes-Robinson would drive the car in the Camel Lights category. The car first made its race appearance at the Road Atlanta 500km in 1985, with Elliot Forbes-Robinson and Tom Winters aboard. They qualified 22nd on the grid and came home 18th, but were 1st in

the new Camel Lights Class. A class win first time out! The 701 car would have a long career through to 1993, first with Whitehall Motor Sports, then with White-Allen Porsche and John Higgins.



The tube-frame 935 supports the regulation production items of roof and pillars that are required. Many Kremer K4 parts were employed, with the mighty 3.2-litre 930 engine squeezed in between the tubes. A super-light construction. (DK)

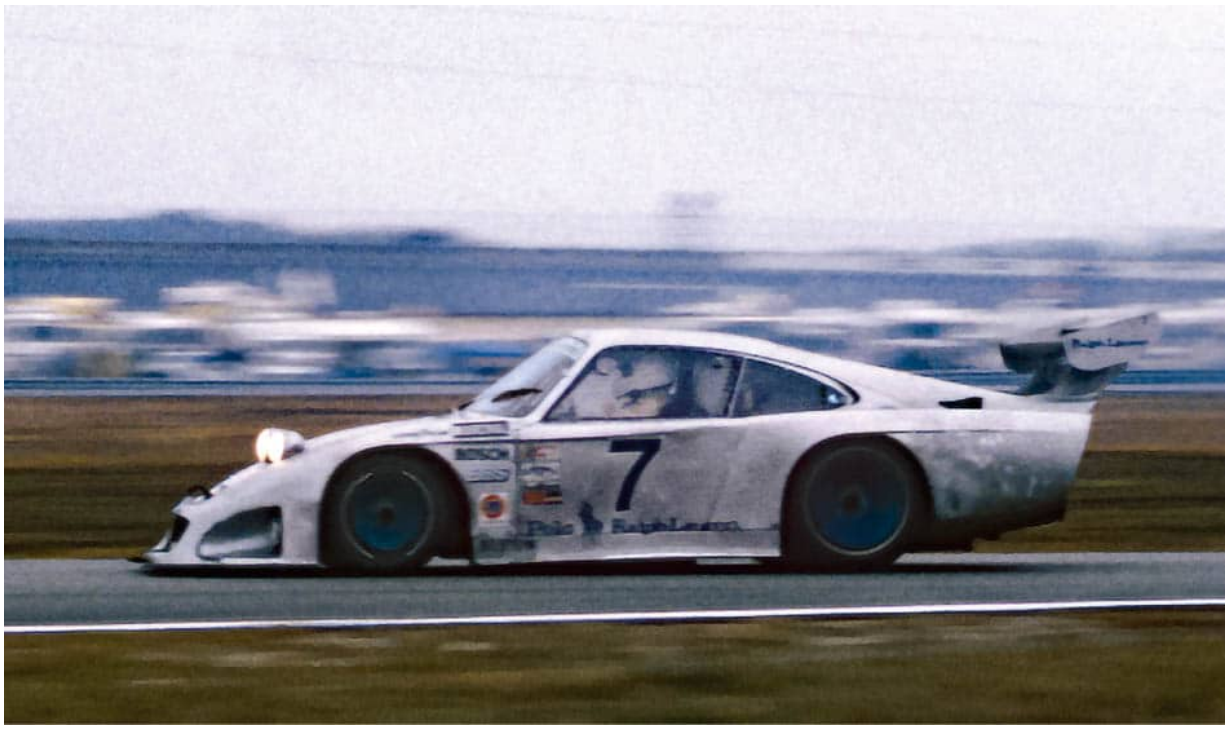
935-84: a tube-frame car, but similar in ideas to the JLP4 from the same design team at Fabcar. (MS)

Dave Klym told the author in 2015: “I built a lot of Porsche-powered cars and designed all but two. Most of them left our workshop as turnkey cars. Amongst them were two Fabcar Camel Light cars, the aforementioned tube-frame 935 built for Bob Akin – the 935-84, which at the time was the fastest 935 ever. Then there was that tube-frame 935 built for John Paul Racing: the JLP4. Lee Dykstra designed that one. Very fast, won several races. Two tube-frame mid-engine 911 cars: those, too, were designed by Lee Dykstra under my direction. Very competitive until outlawed. We did the seven tube-framed 944 TransAm cars, as mentioned, and three tube-frame 911 GTO cars. One of these cars, run by Alex Job Racing, won its class at the Sebring 12 Hours, along with other wins. Five Daytona Prototypes were built in the 2000s.These cars used the water-cooled engines, and won five races in the first year. Two were later converted to using the Porsche Cayenne V8 engines. (We will see more of those cars in Chapter 7.) Then there were the monocoques for Porsche, Holbert and several others.”

I am sure the reader will agree this is some line-up; clear evidence that the Fabcars are a lasting product. We will see more of Fabcar

as we move into the 1990s, the period where it would be building those 962 monocoque chassis for Porsche in Germany.

Twin-turbo arrangements on the 836bhp 3.2-litre 930 engine. The car would run well, but was too late in terms of technology to make any significant impression. (DK)



1985, Daytona: the Fabcar Akin-owned 935, this time driven by Jim Mullen/Kees Nierop/Ray McIntyre, came home 5th overall from 20th on the grid. (MS)

Fabcar CL FGTP 701, powered by a Porsche 2993cc flat-six, seen here at Atlanta for a first shakedown. (DK)

A class win first time out for the Whitehall Motorsports Fabcar Porsche-powered prototype at the Road Atlanta 500km, 1985. (DK)

Sebring 12 Hours, 1986: the 701 Fabcar, entered by Lorenzo Lamas, qualified 35th on the grid of 65 starters. They finished with 212 laps on the board but not classified, running in the IMSA Lights class. (DK)

Mid-Ohio, June 8 1986: a dnf this time for John O'Steen and Chip Mead. (MW)

Tim McAdam/Howard Cherry, Fabcar Lights 70002 at Columbus, Ohio, on 4 October 1987. The sister car, the original 001, sits behind the No 43 car. Unfortunately, the 43 was a non-finisher, but the 42 finished 15th. (MW)

The same IMSA Lights car, No 42, at Sebring for the 12 Hours of 1988 – a pit stop in darkness. (DK)

Sebring 1988: 35th on the grid for Howard Cherry/Charles Monk/Lorenzo Lamas/Jack Newsome/Tim McAdam. They only got to 34th at the finish! A lot of drivers to move up just one place. (MW)

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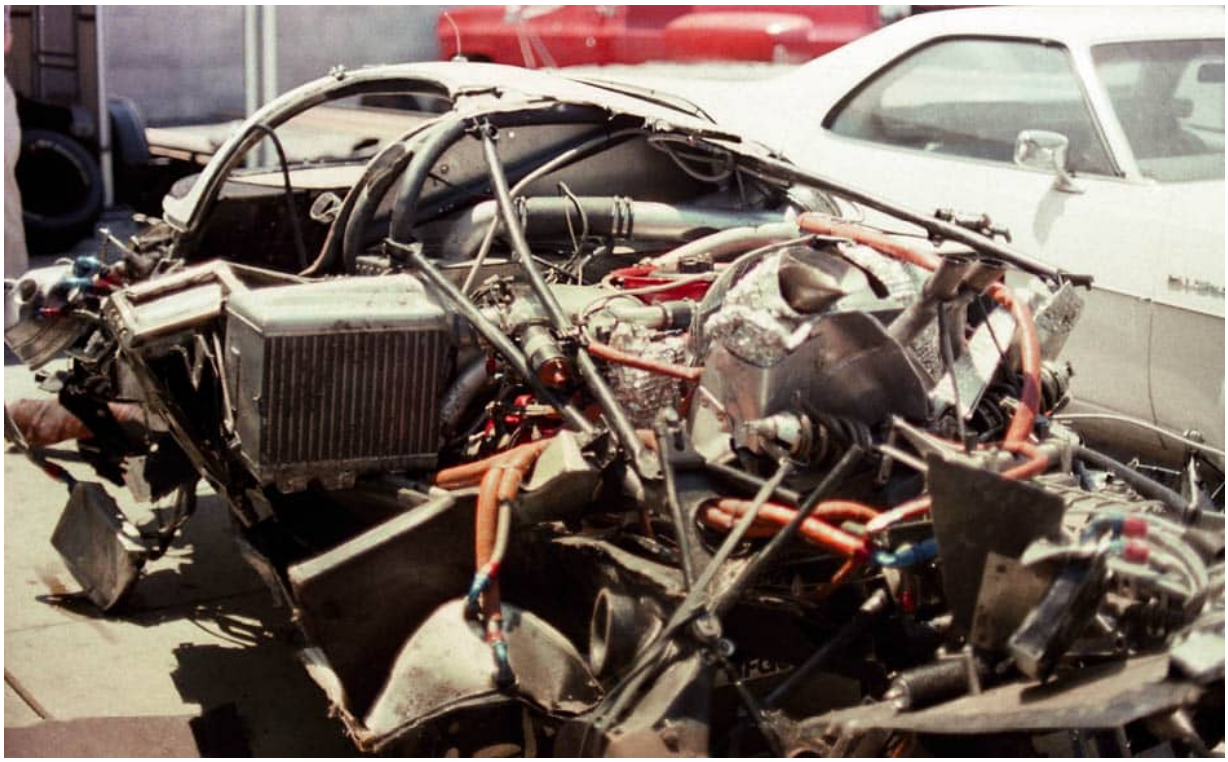
Jim Chapman Developments Porsche Chassis

Following our study of the first part of Fabcar, it is an appropriate point in the timeline of our story to take a look at another chassis manufacturer in the USA influential during the era of the Porsche-powered 962s in the latter part of the 1980s: Jim Chapman Developments. As we have seen, by the late 1980s, Porsche, due to workloads, was not able to cope with the repairs of damaged chassis or even replacement new ones. So sprung up an industry to fill the void. In the UK, Richard Lloyd's GTi Engineering was one of the first not only to make a new chassis tub, but to make it with the bonded honeycomb method of fabrication. John Thompson's company, TC Prototypes (which we will see in a moment) was also to come on the

scene, along with Stickel in Germany and the aforementioned Fabcar.



At Jim Busby's workshop: the BFG Team's early 962 sheet-aluminium monocoque, somewhat bent. (JC)

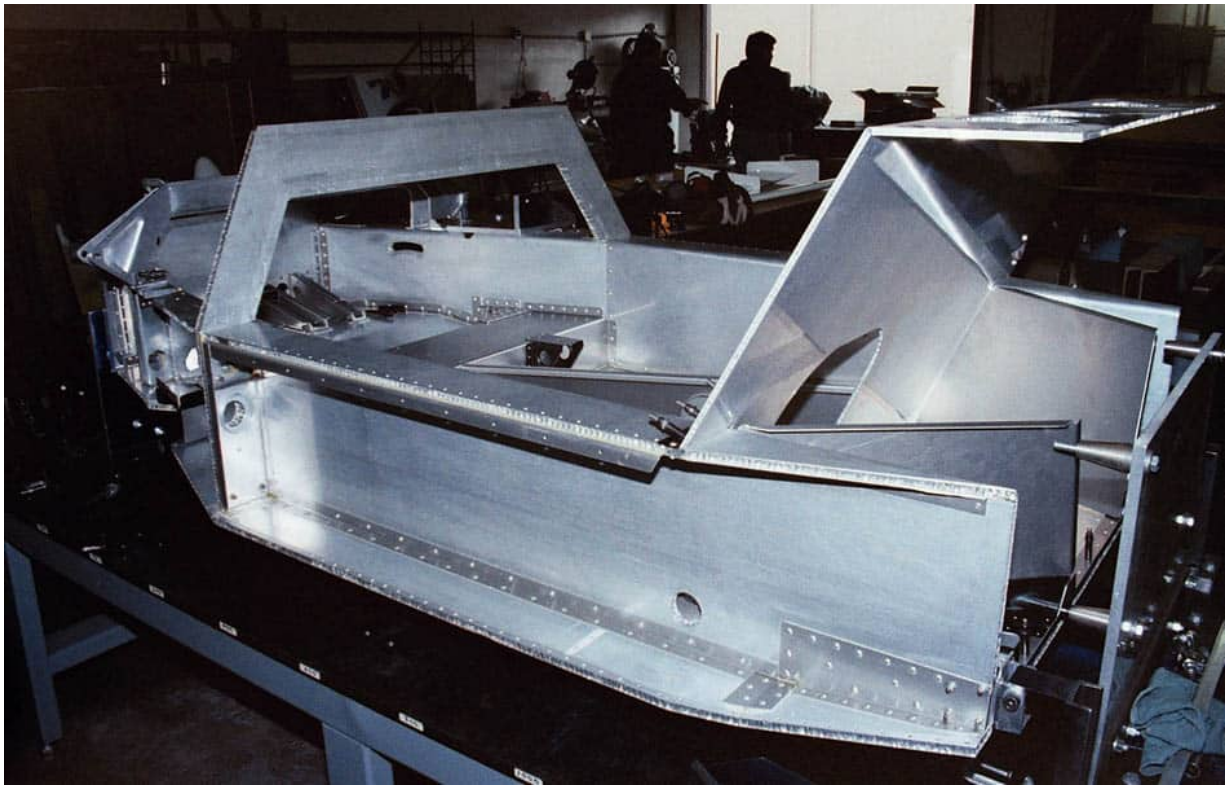
A perfect example of the blend of racers and constructors: we see here in 1989 at Daytona the No 67 962, a Jim Chapman-tubbed example, one of two Jim Busby-entered cars, which was that year's winner for Bob Wollek/Derek Bell/John Andretti, tucked in behind the No 68 Holbert/Fabcar-tubbed 962 of Mario and Michael Andretti, which dnf'd on lap 237 with engine problems. (MW)

Jim Chapman told the author: "24 April 1988, at the Grand Prix of Palm Beach in West Palm Beach, Florida: I was there to meet with another racing team who were interested in having their own new chassis built for a different engine installation. I visited the BFG team, and Bob Wollek was relaxing in a chair under the awning, watching the team mechanics preparing his car between practice sessions. He spotted me and came over, and in a typical quiet Wollek way (a man of few words) shook hands with me and said: 'Thank you!' Even though many months had passed, I knew what he was thanking me for and appreciated it." Bob Wollek, one of the great journeyman race drivers, was talking about safety and chassis strength. The reason

for that handshake started a lot earlier. Jim Chapman Developments Inc had worked with Porsche before, on the Porsche/Interscope 'stillborn' Indy car engine programme in 1978/1979 (more about this can be read in Chapter 8). So, as we might say, Chapman had form, and over the years a high reputation for quality chassis work.

Jim Chapman: "One day in 1985, I had received a call from Jim Busby, who was a customer of ours, to inspect a crashed 962 Porsche chassis at their workshop in Laguna Beach, California. We could see it was not worth repairing, for all sorts of reasons. We contacted Al Holbert about purchasing a new 962 chassis replacement, but Porsche told him the factory could not supply a chassis at that time. That year, 1985, two very good drivers were killed whilst racing: Stefan Bellof in a 956 at Spa, and Manfred Winklehock in a 962C at Mosport, a tragic loss, particularly for their families, friends and all in motorsport."

At the time, the press was calling for crash tests to be done. (Author's note: two factory cars were eventually sent for crash tests in Holland.) It is important to remember the 962 was originally designed to meet the lighter weight regulations of the World Championships Gr C, rather than at IMSA, who imposed a weight limit on the 962 cars before they could race in the USA. Jim Chapman: "I was asked if I would build a replacement chassis for the BFG Team, so Jim Busby and myself discussed my concerns and his. Firstly, I needed something in writing from Porsche to state they would approve Jim Chapman Developments building a Porsche chassis copy. I believed that certain areas needed to be improved, both in overall stiffness and in safety, especially forward of the dash panel. Jim Busby's reply was: 'Do whatever you feel to improve the chassis, but remember that all stock 962 parts must still fit as supplied by Porsche.' This was going to cost! Busby and BFG were not going to pay for my design work, tooling, jigs etc. I was going to be taking a considerable risk, and at the time with no other customers to commit to buying any more chassis. Jim Busby did, however, say he would do his best to talk with Al Holbert and persuade him to invest in the updated chassis."



The Chapman Developments No 1 honeycomb chassis early in 1986. (JC)

Jim Chapman Developments had moved to a larger workshop earlier in 1985, which provided the opportunity to take on more projects. Jim Chapman continues: “I spoke with John Sunders-Hyde, my shop manager, about the possibility of a Porsche honeycomb chassis. With the commitment made, I made a request for drawings from Busby, but was informed Porsche would not allow prints to be released to me. But I could measure two different used factory chassis to acquire the dimensions I needed. The problem was that the two chassis we looked at did not measure the same! Anyway, we got on with it, noting what I felt needed improvement. Having repaired Porsche chassis previously was a big help. We determined where on a honeycomb chassis layout the required ‘hard points’ for mounting suspension, etc, had to go, before the aluminium sheets and sandwich were bonded together as completed panels. For every solid rivet installed, you had to have a stronger section, a ‘hard point.’

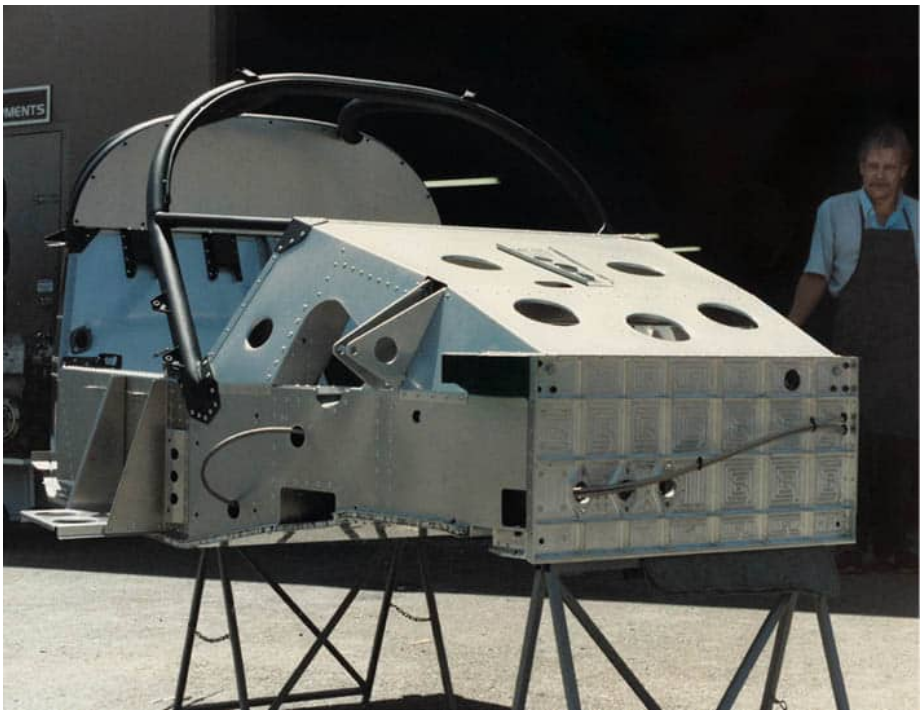
“Several of the ‘aircraft’ subcontractors, who were making

honeycomb bonded sheeting, were not interested in small-quantity supply. So I contacted Dennis Stevens at Technical Resin Bonders in Huntingdon, Cambridgeshire, England, and also called Patrick Head [now Sir Patrick Head] at Williams Grand Prix. I knew Patrick from my Lola days, and Williams Grand Prix had successfully designed and raced honeycomb chassis Grand Prix cars, winning three World Championships in the 1980s. Patrick gave me a tour of their racing facility, explaining how they produced honeycomb panels in-house. By this time, though, all of the Formula 1 chassis were being produced in moulded composites. Dennis Stevens at Technical Resin Bonders was very helpful. Of course, things took time, and although I had gone to the UK on 18 September 1985, we only got the first delivery in December. We had built a jig and were ready. Steve Hattori of Salinas Valley Precision was employed to design and supply components – never let me down, in quality or delivery time, which was always tight. That's motor racing. We delivered the first honeycomb chassis to Jim Busby's workshop in Laguna Canyon before the Riverside race weekend of 28 April 1986.

"Al Holbert came to look at our first finished honeycomb chassis. Al showed surprise, and a 'racer's' interest in a new approach to how the chassis was constructed. Another gentleman was with Al [author's note: we have to leave him nameless]; by contrast, he was not pleased at all with what he observed. So there we were. I had taken a huge financial gamble in funding design, jigging, and the tooling required to build the first chassis without any guarantees, and there were concerns from several folks that the honeycomb construction would require far more maintenance, and therefore be more labour-intensive for the racing crew. However, as it was proven after a couple of hard races, the honeycomb construction required much less maintenance than original cars. Word came back to me that our customer was singing its praises.

"I then met with Al Holbert at the Riverside race to discuss building some chassis for Porsche North America. They ordered two honeycomb chassis. Al, being in charge of Porsche Motorsport North America, secured chassis drawings for me to build the chassis. Do you know? The dimensions matched those I had assimilated for the

first chassis! Those led to us receiving orders for four more honeycomb chassis. We did not number the chassis, as they were only supposed to be replacements for damaged (in racing) stock factory Porsche 962 cars as needed."



The first honeycomb chassis to go to Jim Busby's workshop in Laguna Canyon before the Riverside race weekend of 28 April 1986. (JC)

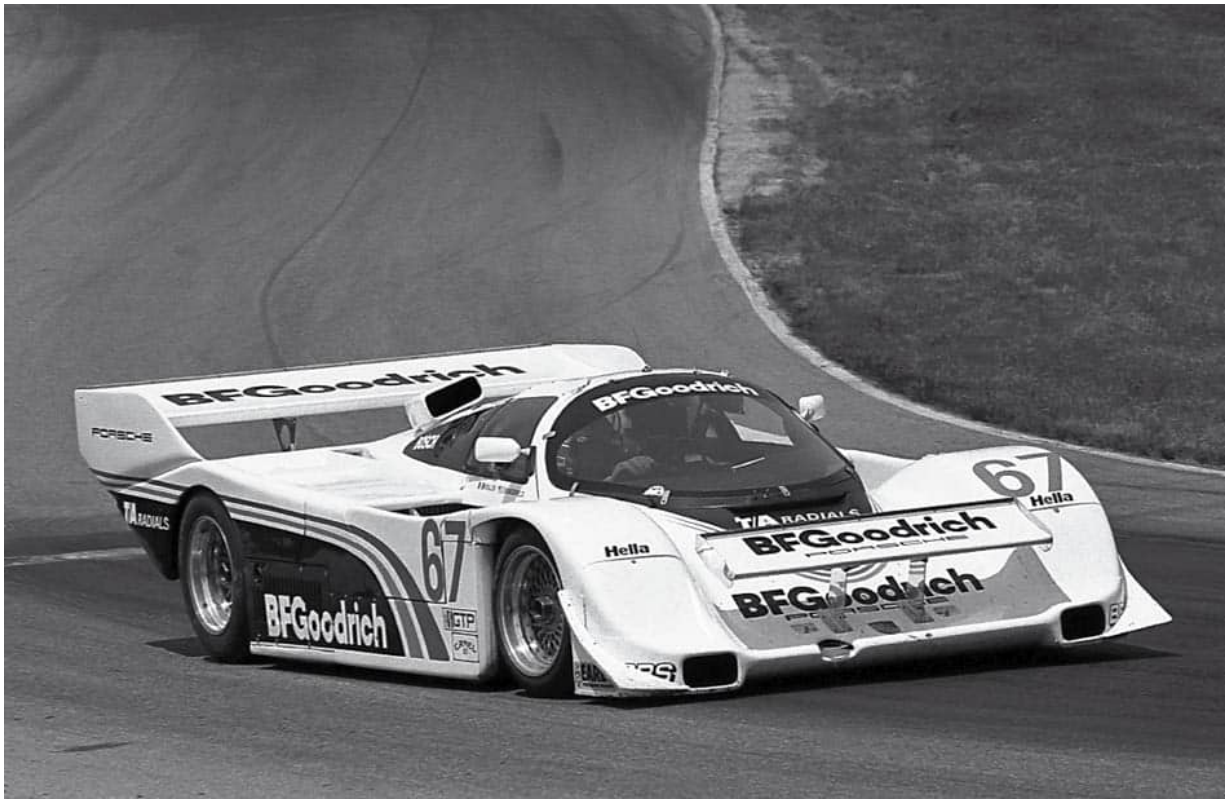
Bob Wollek had a huge crash at Sears Point, 2 August 1987: it was the first heavy multi-impact that a Jim Chapman Developments honeycomb chassis had received. A rear tyre had exploded, causing Wollek to lose control, flipping and tumbling the car (as can be seen on YouTube). It lost almost all its bodywork. The honeycomb monocoque tub, though, survived intact, as did Bob Wollek. The 'driver's cell' had maintained its integrity. Only the onboard camera mounting caused damage, injuring Bob's shoulder and ribs.

Jim Chapman: "Well-run racing teams like Jim Busby/BF Goodrich always stripped down cars anyway between races for crack check, service, replace and rebuild to reduce the possibility of a mechanical

failure, at every testing and racing event. Thinking back now, over 30 years ago, to have invested in a honeycomb racing chassis had many benefits over the standard sheet aluminium construction (except for weight). I shall always be grateful to Jim Busby for having complete trust in choosing us to design and build their honeycomb chassis; after all, he definitely had other choices available." Sadly, Bob Wollek lost his life while riding his bicycle before the 2001 Sebring racing event weekend, after he had survived at Sears Point and many other incidents during his illustrious racing career.

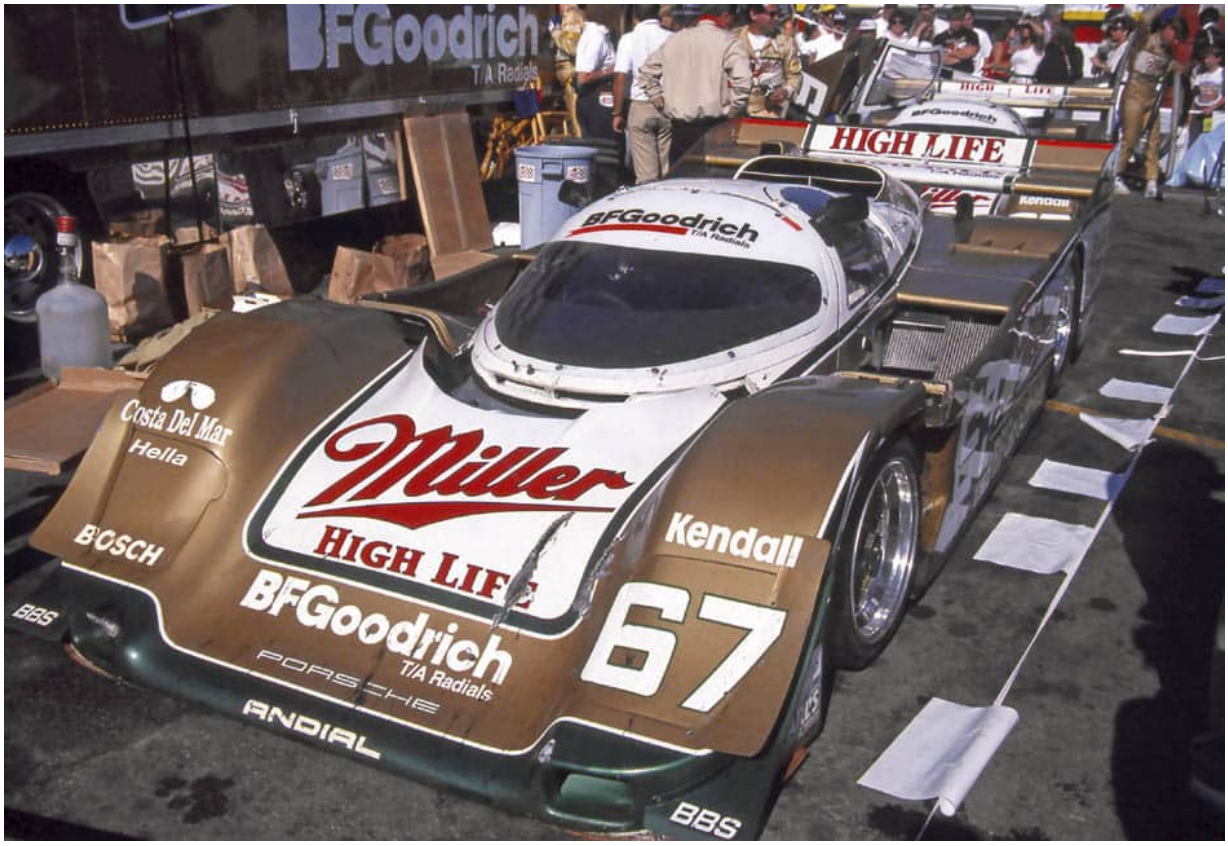
Jim Chapman told the author that a total of seven 962 honeycomb chassis were built:

- two for Jim Busby (BF Goodrich Racing Team) – 01 and 02 (962-108B and 962-108C) (note: the original 962-108 was a factory chassis);
- two for Al Holbert (Porsche Motorsport North America);
- two for René Herzog (Alucraft A G Zurich, Switzerland);
- and one for Bob Akin Motor Racing.



Mid-Ohio 500km 1987: 7th on the grid for Brassfield/Wollek and 2nd overall; the Chapman C01 chassis. Note: here we see a version of the front wing similar to the Holbert cars. (MW)

Jim Busby's Goodrich-liveried Chapman C02 chassis appeared in these colours before going into the Miller Livery, seen here at the Mid-Ohio 500km on 5 June 1988: 5th overall for Bob Wollek/Mauro Baldi. (MW)



The Jim Busby-run Chapman C02 at the Sears Point 300km, 10 September 1989: Bob Wollek/Derek Bell, 9th overall. (MW)

Chapman C04 at Columbus, Ohio, 7 October 1987: the Bob Akin-entered 962 of James Weaver/Hurley Haywood finished 8th overall. (MW)

Chapman C06, Rene Herzog/Hurley Haywood/Scott Schubot at the 1990 Sebring 12 Hours: 10th on the grid, but unfortunately a dnf. (MW)

An open chassis tub called a 966-01 was supplied to Gunnar Racing.

(Author's note: I was advised that each manufacturer of chassis tubs built them in slightly different ways, usually quickly spotted by looking at the spacing, type of rivets, and the construction, though the cars built for the factory would also have looked very similar, as they would have all been produced from the same drawings. The TC prototype chassis had a honeycomb front panel and steel wishbone mountings, whereas Jim Chapman Developments used a milled front panel along with milled aluminium top damper mounts.)

♦ ♦ ♦ ♦ ♦

At this point in our story, the name John Thompson – TC Prototypes

– has shown up many times, and, as before, there is an appropriate point at which to talk about those chassis, for, like Jim Chapman Developments, John Thompson did not build complete cars; he built chassis tubs. Here we will take a brief look in a listing form at many John Thompson Porsche chassis and who had them originally, to provide a flavour of the volume of the TC Prototypes production. There may have been more for Porsche model replacements, and it is well known that Thompson's skills stretched way beyond to several other marques. Here we see the Porsche 962 versions that the author was able to identify, compiled from known records, plus those involved with restoring and running the chassis in period and today.

A selection of the 962 chassis made by TC Prototypes in the UK

Model	Team	No	Where/when first seen	Car No	Livery
962C	Kremer	114	Nürburgring 24/8/1986	10	SAT
962C	Walter Brun	001-BM	Jarama Supersprint 22/3/1987	1	Gaggia
962C	Kremer	110 CK	Jarama 22/3/1987	10	Kremer
962C	Joest	116	Hockenheim 29/3/1987	1	
962C	Walter Lechner	WLM 001	Nürburgring 26/4/1987	35	Moser
962C	Kremer	118 CK 3	Le Mans 14/6/1987	11	Leyton House
962C	Walter Brun	002-BM	Norisring 28/6/1987	2	Rial
962C	Kremer	118 CK2	Norisring 28/6/1987	10	SAT
962C	Kremer	K6 88 CK6	Hungaroring 3/4/1988	10	Yokohama
962C	Schuppan		Le Mans 1988		Takefuji

962C	Kremer	K6 89-1	Fuji 12/3/1989	16	Leyton House
962C	Walter Brun	005-BM	Fuji 12/3/1989	7	Alpha
962C	Walter Brun	004-BM	Suzuka 9/4/1989	6	Jägermeister
962C	Kremer	CK6 06-02	Hungaroring 23/4/1989	5	
962C	Walter Brun	003-BM	Fuji 9/10/88	77	Memorex (Gebhardt)
962C	Walter Brun	006-BM	Dijon 21/5/1989	16	Jägermeister
962C	Walter Brun	007-BM	Fuji 8/4/1990	15	Hydro Aluminium
962C	Walter Lechner	152	Hungaroring 4/5/1990	1	Jim Beam (thought to be a possible replacement for Porsche chassis 152, the last Porsche factory-made 962 chassis)

962C	Kremer	CK6-04 001K	Suzuka 8/4/1990	32	MaruKatsu
962C	Kremer	CK6-05 002K	Spa 3/6/1990	10	Sireg
962C	Obermaier	155	Suzuka 8/4/1990	27	Primagaz
962C	Obermaier	901	Suzuka 8/4/1990	26	Primagaz
962C	Alméras	EAF 1	Monza 29/4/1990	34	National
962C	Walter Brun	008-BM	Silverstone 20/5/1990	17	Torino
962C	Obermaier	902	Silverstone 20/5/1990	26	Primagaz
962C	Kremer	CK6 07-2	Le Mans 17/6/1990	10	Kenwood
962C	Kremer	CK6 09	Le Mans 23/6/1991	46	Elf

Two unnumbered chassis were also supplied to Jochen Dauer, one of which went to Gebhardt, and the second to be utilised by Dauer as a race car and a road car experiment.

(Author's note: this list is not to be taken as definitive. Also during the writing of this work the author was informed by sources in the UK that two alleged factory cars 962-004 and 962-010 were crash tested in Holland, post the 1985 fatal accidents, and subsequently rebuilt with new TC Prototype un-numbered replica chassis tubs in 1990.)

♦ ♦ ♦ ♦ ♦

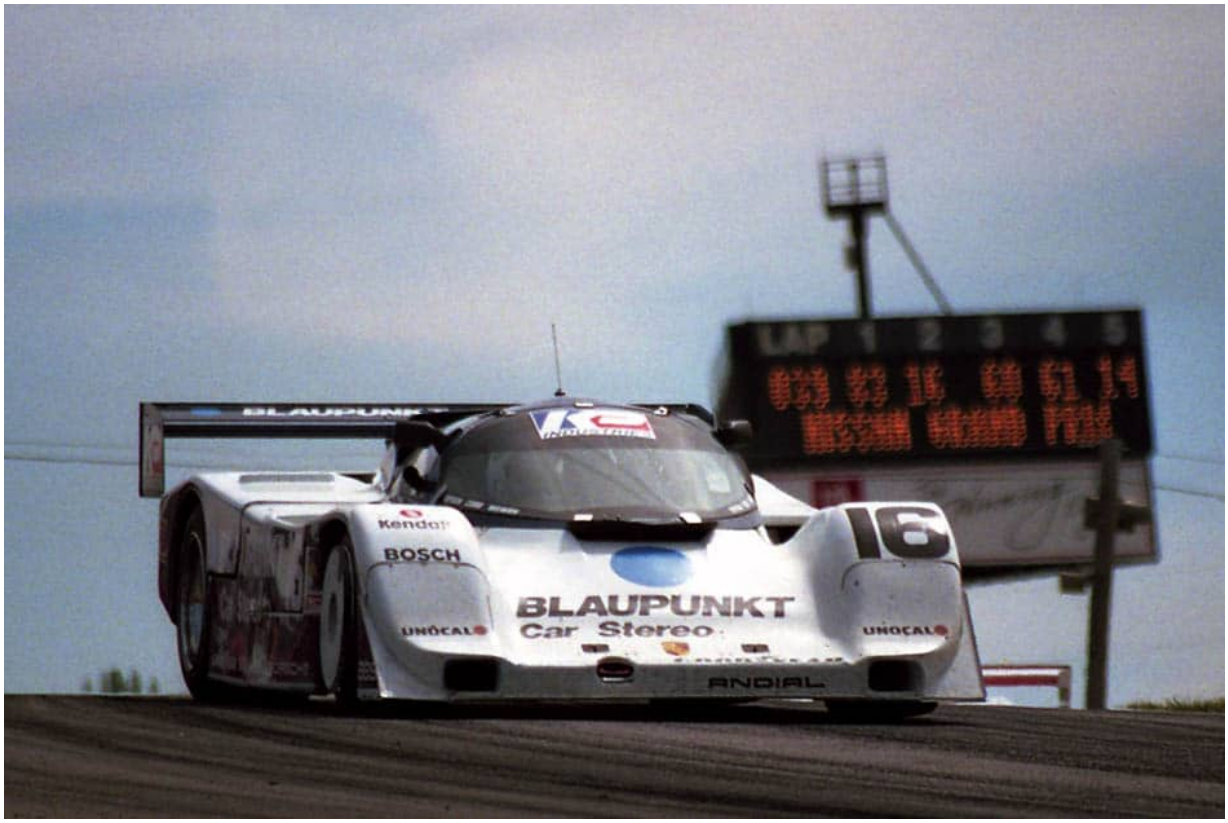
Dyson-Porsche

Team owner Rob Dyson began racing in 1974, and progressed through various SCCA races, moving on to national events in 1977, and on to IMSA GTO in 1982. He acquired 962-01 in May 1985 from Bruce Leven's Bayside racing team to race in IMSA GTP. He also acquired the ex-factory 962-120 with which Dyson achieved four victories, four seconds and five thirds between 1986 and 1988. He then acquired chassis 962-122; however, whilst testing at Watkins on 6 July the car was wrecked, and a new chassis tub was acquired, it is said, from John Thompson in England which was to be numbered 962-122A.

Dyson himself drove in the Liqui Moly team's Richard Lloyd GTi Engineering 962-106B at Le Mans in 1986, where with Mauro Baldi/Price Cobb the car was to finish 9th overall.

Laguna Seca 3 May 1987: the 962-122A car of Rob Dyson/Price Cobb, said to be a Thompson chassis. Pole position, though numerous problems resulted in a 20th place overall. This IMSA car had already won at Atlanta in the April and would win again at Road America in August. (MS)

The 962-122A would race on 10 occasions over the 1987-88 period. (MS)



1988, Mid-Ohio: the Richard Lloyd GTi Engineering IMSA honeycomb-tubbed 202 becomes the Dyson Racing Dr1. (MW)

For 1988 Dyson acquired a chassis tub which would be labelled the Dyson DR1 962. It was the Richard Lloyd GTi Engineering IMSA chassis 962-202. Blaupunkt Electronics became the prime sponsor, using its corporate blue and white livery. The 962 DR1 quickly became one of the fastest 962s around in 1988. Nissan had won eight races in a row, but did not win the 9th, and the Nissan run-breaking Dyson 962 DR1 helped Porsche win the 1988 IMSA Manufacturer's Championship just one point ahead of Nissan.

The Dyson DR1-Porsche raced on 12 occasions in the late 1980s, taking one victory in the San Antonio 3 Hours on 4 September 1988.

There was also a Dyson DR2, which had a Fabcar chassis tub underneath Dyson bodywork. This car ran at the Nissan Grand Prix at Road America on 21 August 1991, but failed to finish due to clutch problems. It had run previously at the Watkins Glen 500 on 30 June 1991, where it dnf'd, also at the Laguna Seca 300km, where Rob

Dyson and James Weaver were to finish 6th overall. After that it seems to have disappeared.

Dyson raced Riley and Scott cars for several years before son Chris Dyson, along with the Howard Motorsports Team, returned with a Daytona Prototype in the 2000s.

By October, the RLR 202 had also undergone the modification of the added front wing. Here it is at Columbus on 2 October 1988. (MW)

By January 1990, the RLR 202 DR1's front wing had been dumped in favour of the conventional nose arrangements, carried through from the Daytona 24 Hours to here at Sebring. (MW)

The Dyson DR2, which featured a tub by Dave Klym (Fabcar), at Road America 1991. (MW)

This car ran at the Nissan Grand Prix, the Watkins Glen 500 and the Laguna Seca 300km, where Rob Dyson and James Weaver were to finish 6th overall. (MW)

♦ ♦ ♦ ♦ ♦

Gebhardt-Porsche

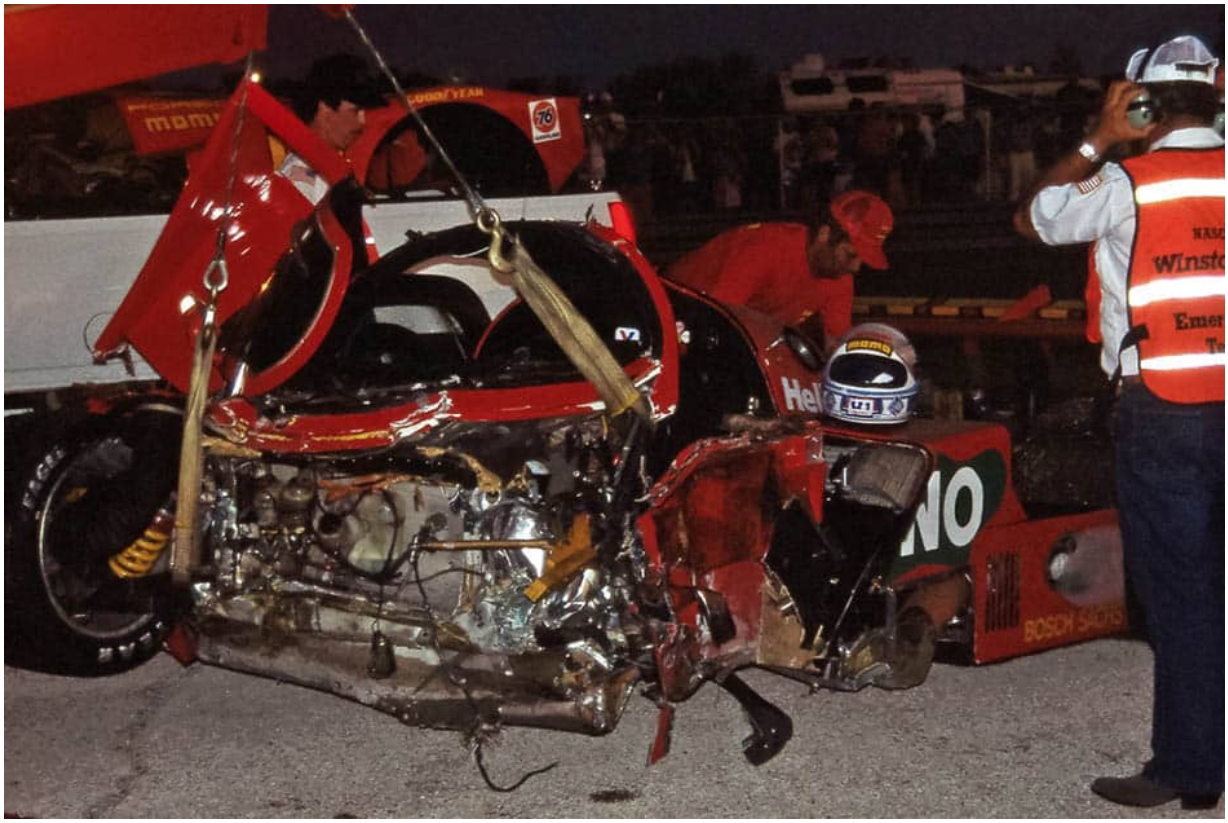
Fritz and Günther Gebhardt Motorsports are well known for creating some very interesting cars over the years, both in single-seat and sports car styles. But it was in August 1988 that a Porsche-powered 962 car came on the scene, the first being the former Brun Motorsports 962-003-BM with its chassis tub created by John Thompson in the UK. Gebhardt also had a second 962, the Brun 962-128. Fritz Gebhardt told the author: “The 962-128 was a leased car from Brun, and raced at Columbus in the 300km in the hands of Gianpiero Moretti/Steve Philips, achieving 13th overall from 18th on the grid. Next race was the Tampa World Challenge. [The car later returned to Brun to be raced to 10th overall at Le Mans in 1989, as No 16 in Hydro Aluminium livery.] 962-003-BM raced at Fuji in September 1988. Then it was transported to Australia for the

Sandown Park Supersprint 1988, but we did not do the race, due to our sponsor Memorex not wanting to do the sponsorship in Australia. From Australia we sent the car to Florida for the Tampa World Challenge race (race No 77) on 27 November, but the car was crashed by Harald Huysman and was not able to start the race. The 962-128 (No 30 for the 128) in Momo livery went on to finish 5th overall." The car was then returned to Brun for 1989.

19th on the grid for Tiff Needell/Gianpiero Moretti/Harald Huysman: the first Gebhardt-run car seen here in the 1988 Fuji 1000km. (Thompson chassis tub, former Brun Motorsport 962-003-BM.) (FG)

Leased car 962-128 at the 1988 Columbus, Ohio 300km: 13th overall from 18th on the grid. (MW)

Chassis 962-003-BM, renumbered 962-001GS and now in Momo/Torno colours, the team qualified 14th on the grid for the Daytona 24 Hours. (P)



Oops! Unfortunately, on lap 80 Mauro Baldi encountered brake failure, sending the car on a path to destruction. (FG)

Luckily Baldi was able to escape, though he suffered minor injuries. (FG)

Fritz Gebhardt continues: “The repair after the Tampa crash with 003-BM of Huysman was carried out by some guys from Fabcar at Jack Kalagian’s workshop.”

From Tampa the 003-BM car went to the test days in Daytona, January 1989. For the 1989 Daytona 24 Hours the No 30 Momo/Torno car (now 962-001GS) qualified 14th overall. However, in the race, Mauro Baldi crashed in the horseshoe due to brake failure on the left rear calliper on lap 80.

Fritz Gebhardt: “The No 30 001GS car went back to Germany for a complete rebuild in our workshops, utilising an unnumbered tub acquired from Dauer Racing, which had been supplied to them by Thompson in the UK. The car returned to racing in the USA on 5 March 1989.”

Unfortunately, it was again involved in an accident six laps in, and failed to finish. Quickly repaired, it went on to race at the Sebring 12

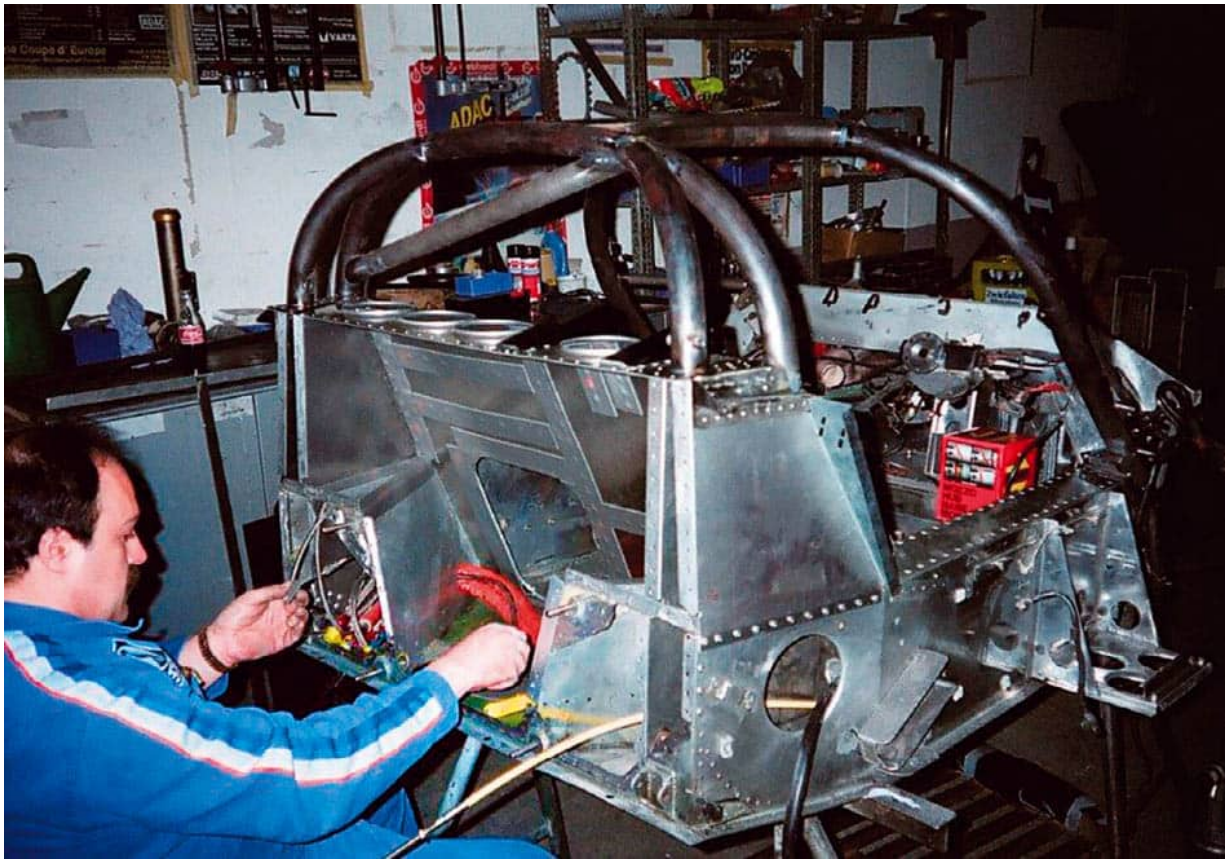
Hours (18 March 1989), finishing 4th overall. Then it was off to Road Atlanta on 2 April where it was 3rd overall in the hands of Gianpiero Moretti/Stanley Dickens. This was followed by races at West Palm Beach on 23 April 1989 (8th on grid, 14th overall), then a nip back to Germany for servicing before returning to Lime Rock on 29 May. Then to Mid-Ohio on 4 June (3rd overall from 8th on grid), before another return to Europe, for service and to do the Norisring Supercup 200 Miles on 25 June, where Moretti was 4th overall, then quickly back to the USA for the Watkins Glen 500km on 2 July 1989 (Moretti/Jelinski 4th overall), followed by the Road America 500km on 16 July (9th on grid, 7th overall), and the Portland 300km on 30 July (10th overall). Then came the 2 Hours at San Antonio on 3 September (4th overall), 300km at Sears Point on 10 September (8th overall), 360km at Tampa on 5 October (5th overall); then back to Europe for another service and overhaul before the Interserie at Zeltweg on 15 October.

Miami 3 Hours 1989: the now 962.001GS, built from parts of the former Brun chassis 003-BM. Top 962 man Trevor Crisp says: “The original of this car written off at Daytona in 1989 was to be replaced by a new unnumbered John Thompson all-aluminium tub, supplied to the Dauer team, and then to Gebhardt.” So it would be a new chassis at the Miami 3 Hours 1989. Massimo Sigala at the wheel – a dnf. (P)

Road Atlanta, 2 April 1989: the No 30 car 962-001GS came 3rd overall in the hands of Gianpiero Moretti/Stanley Dickens. (MW)

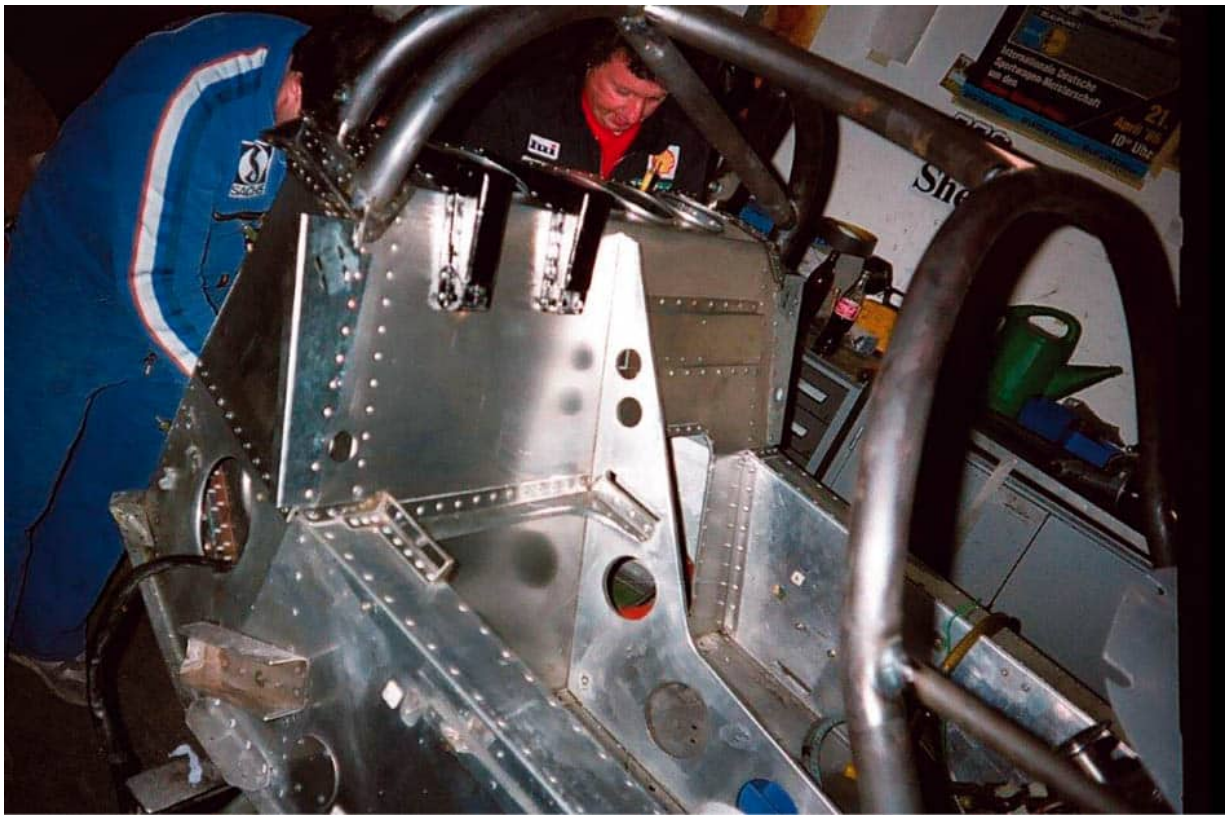
Here at the Norisring Supercup meeting – note the panels change at the 200 Miles of Nürnberg. Gianpiero Moretti, 8th on the grid, translated to a 4th overall. (P)

Road America 500km, 16 July: 9th on the grid and 7th overall for Moretti/Ricci. (MW)



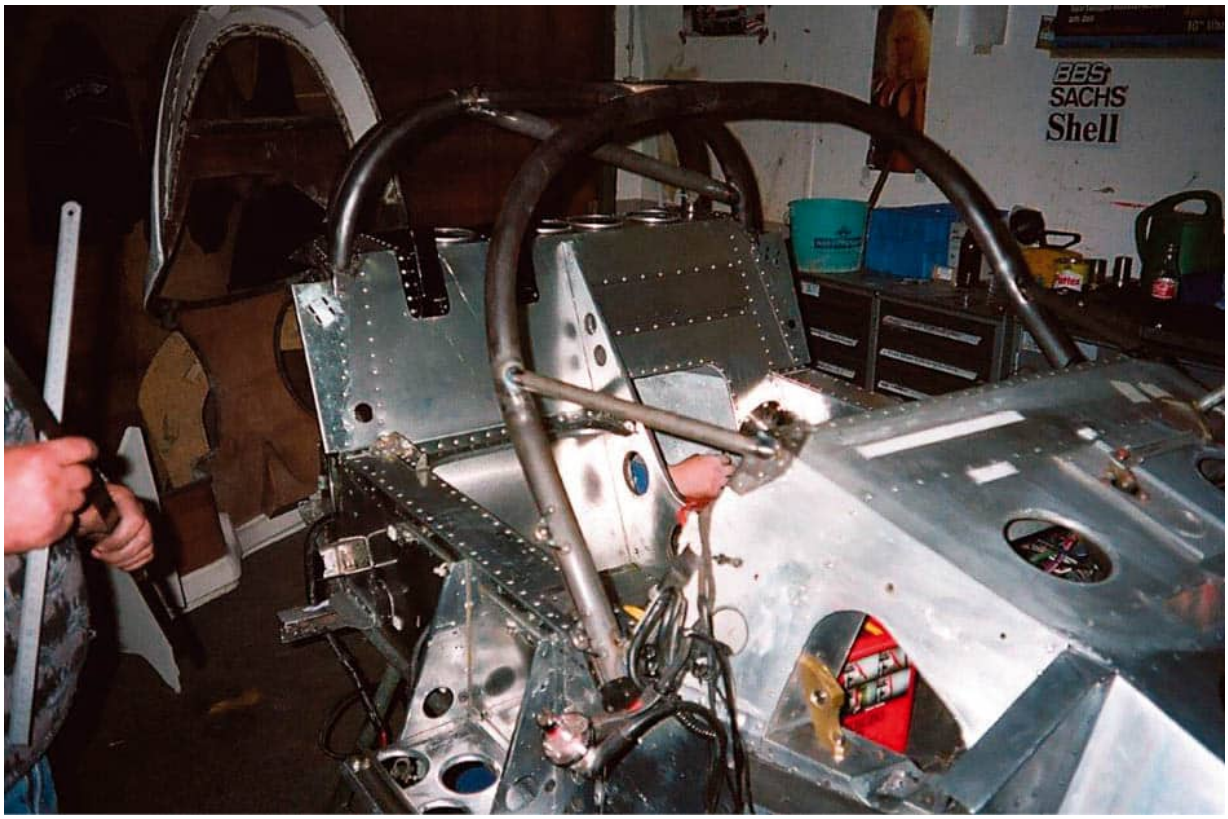
Fritz Gebhardt says: “We frequently fitted new aluminium sheets during an overhaul which we put in to make the tub stiffer, especially around the fuel cell.” (FG)

All hands to the pump to dismantle, check and rebuild the No 30 in 21 days. (L to R) Chief mechanic Bill Harris, Design and Technology Günther Gebhardt (former driver), workshop manager Herbert Willert. (FG)



Fritz Gebhardt: “This tub, the original but with lots of improvements, stays in the car up to today. It was very competitive after our changes.” (FG)

Rebuild after Bell's crash at Daytona in 1990. (FG)



The Gebhardt motor sports team had full facilities to rebuild and improve the tub. (FG)

Fritz Gebhardt says: “We raced only the one car, and this was going back every six or seven weeks for overhaul at our works in Germany; during this time we very often made changes to get it more competitive, and when there was time we would do an Interserie or Supercup race.” A full racing season, without a doubt, and no lower than 10th anywhere, excepting at Zeltweg where it was a dnf.

However, the new 1990 season set to start at Daytona on 4 February 1990 would turn out to be a bad day at the office for the team, and for driver Derek Bell, who told the author: “I wish I did know what had happened; luckily I escaped with only a stiff neck! I had been flat out on the banking when something broke at the back of the car. Next thing I know is I am flying through the air upside down. I did not hit anything, but came to a halt still upside down; fuel was everywhere and I hit the extinguisher button automatically. After that I must have passed out with the fumes – worst crash I ever had.”

The car was, of course, returned to Germany, stripped, rebuilt and returned to the USA in 21 days to be on the grid at the Miami Grand Prix. Derek Bell was back at the wheel along with Gianpiero Moretti/Almo Coppelli. They came 17th overall (8th in GTP), having placed the returning car 12th on the grid.

In the USA at the Road Atlanta 500km on 1 April, Moretti/Bell had finished 4th from 12th on the grid, but at West Palm Beach the team incurred a rare dnf through engine failure. During 1990, the best result for the MOMO team was a 2nd overall at the Interserie round at the Wunstorf International on 3 June 1990. Moretti, once more driving, was on the front row in P2. Following this, it was on to the Le Mans 24 Hours on 17 June 1990. Qualifying 35th on the grid, Gianpiero Moretti/Günther Gebhardt/Nick Adams were looking forward to a good run. Things certainly started well: they led the class for four hours and were just settling down for the long haul when gearbox failure intervened.

1990, Le Mans: the #230 with Günther Gebhardt at the wheel after a pit stop. (P)

35th on the grid: the much-travelled old faithful, 962 001GS, arrives at the Le Mans 24 Hours 1990. (P)

Le Mans 1990: 35th on the grid, Gianpiero Moretti/Günther Gebhardt/Nick Adams led the class for four hours; however a dnf was incurred when gearbox failure intervened on lap 141 at 02.12h on the Sunday. (FG))

Impeccably prepared – the well-known IMSA GTP MOMO-sponsored car looked good for the race. (FG)

Last heard of at the 1993 Le Mans, where it was entered by Guy Chotard and finished 14th overall from 20th on the grid with Denis Morin/Didier Caradec/Alain Sturm at the wheel. (P)

Le Mans 1993: 309 laps completed. A side-view image for those readers of the modelling persuasion. (FG) (Author's note: it has to be said that this was a remarkable car from a remarkable team, the Gebhardts: a team worthy of a book just on themselves.)

After Le Mans, the team returned to the USA for the Watkins Glen 500km, where a 6th place rewarded the efforts of Moretti/Derek Bell in No 30. At the Portland 300km, Gianpiero tried a solo drive, but had to retire due to driver fatigue. Joined again by Derek Bell at the Tampa World Challenge round, Moretti had a better time with his company's sponsored car, finishing 7th overall. The car returned to Europe for a further rebuild of both engine and chassis. 1991 started with an engine failure at the West Palm Beach 2 Hours. But at the Sebring 12 Hours on 16 March, Moretti, joined by Helmut Mundas/Stanley Dickens, finished 10th overall, followed by a 7th at the 2 Hours of Miami with Derek Bell again.

Fritz Gebhardt decided that the car had done enough and on its return to Europe he sold it to Guy Chotard in Rennes, France, who engaged the Almeras brothers to run it for him (see the Almeras-Porsche section). The car was last heard of in period at the 1993 Le Mans, where it was entered by Guy Chotard, finishing 14th overall from 20th on the grid with Denis Morin/Didier Caradec/Alain Sturm at

the wheel.

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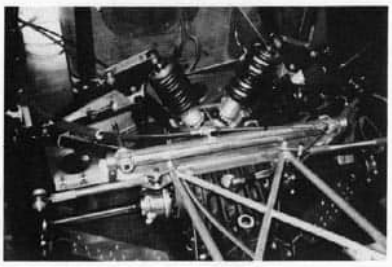
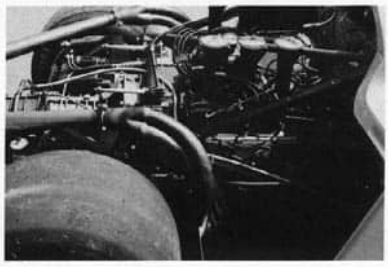
Royale RP40-Porsche

Royale cars come to us with experience, due to other race car connections including Argo and TIGA. Three Royales ran in 1985; one RP40 JM16/102 Argo (also JM16/097-Mazda, JM16/099-Buick Argo) ran throughout 1985 with Buick power. The first 'genuine' Royale RP40-Porsche was to go to the USA in 1986. (At Daytona it was joined by the Argo version in JM16/101-Buick.) Over the years from the mid to late 1980s, Royale/Argos raced with numerous engines apart from those listed here. We, of course, are interested in the Porsche example.



Push rod rear suspension, adjustable rising rate.



Porsche 911 engine installation.

Ergonomically efficient instrument and switch panel.

Special attention has been paid to providing maximum driver safety. At the front, a honeycomb nosebox is intended to progressively collapse upon severe impact. Side driver protection exists from dual separated honeycomb panels, and an outrigger panel. The roll cage is of 1 5/8" chrome-moly tube, heliarc welded. The fuel cell is center located behind the driver, enclosed fully within a honeycomb tank. The driver's feet are behind the front axle line.

Whenever practicable, for USA customers, American components of proven quality have been used in order to facilitate replacement. Examples are: Aeroquip fittings and hoses; Jones tachometer; VDO gauges; U.S. military aviation switches; ATL dry-break refueling valves.

The ROYALE RP40 has been designed to provide the maximum aero-dynamic benefit from ground effect principles, consistent with minimum drag. Downforce is generated by twin kevlar and carbon-fiber tunnels, and balanced by a single rear mounted carbon fiber wing. The design was originally tested and developed in a "moving bed" wind tunnel at Southampton University and has since been further refined through full size wind tunnel analysis and track testing.

An extraordinarily strong and rigid monocoque chassis is constructed of individually designed and manufactured aviation specification honeycomb panels and chrome-moly tubing. The design allows quick and simple engine changes. Great care has been taken to insure that the ROYALE RP40 is easy to maintain and that critical areas have good service accessibility.

Suspension and brakes are extremely heavy duty while being constructed as light in weight as proper. All wishbones and arms are of heliarced chrome-moly, which has been heat tempered by oil quenching, then stress relieved, and finally black Kephos treated which protects while allowing crack testing without removing the coating. Uprights are magnesium. The bearings, axles, uprights, and drive shafts have proven capable of handling over 700 h.p.

Stocks of spare parts for the ROYALE RP40 are maintained at Hiawassee, Georgia, USA, and Godmanchester, Cambridgeshire, England. Normally available for overnight shipment. Factory technical assistance program available to customers.

For more information, contact:

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England
0480-860020

ROYALE ENGLAND

The original ROYALE IMSA GTP car was first produced in early 1984 and immediately became the standard of comparison for all cars in what would become the Camel Light class in 1985.

Its enduring success is the result of a deep understanding of the requirements of IMSA endurance racing; and then the design and construction of the best car possible to contend those challenges. The ROYALE is a "no compromise" endurance racer, specifically engineered to survive and win long races on rough tracks, with low maintenance. Its dominance over other makes in 1984 and 1985 has proven its ability race after race in meeting this goal.

Its basic designer, Nigel Stroud, is internationally respected for his outstanding accomplishments in the creation of professional level, long distance sports racing cars, and development work on Formula 1 and Indy cars.

THE ROYALE employs only the highest quality materials, componentry, and advanced engineering and fabrication techniques, which are found only in the most expensive and successful cars. Extensive use is made of carbon fiber, kevlar, chrome-moly, aviation specification honeycomb, and magnesium. Constant improvements are being made and the design continually updated.

The ROYALE RP40 is a development and evolution of our 1984 and 1985 models which won twice as many IMSA Camel Light races as all other makes combined. Starting with the 1986 model, the ROYALE fully complies with both the spirit and letter of IMSA and WORLD SPORTSCAR CHAMPIONSHIP Regulations, and may be raced without alteration in either series. Only a temporary reduction in fuel capacity is required for WSC/2.

Currently there are available 4 engine versions of the ROYALE RP40: Cosworth DFV/DFL, Buick V-6, Mazda 13B, and Porsche 911. The 1986 cars are "convertible" for all 4 engines, in that motor "swaps" may be customer accomplished, thus extending the life and value of the car if circumstances favor one engine over another. Other engines of similar size/configuration could also be accommodated.

Particularly significant features of the ROYALE RP40 are:

Longer wheel base and wider front track for greater stability.

All aviation honeycomb, heavy duty full monocoque. Customer repairable.

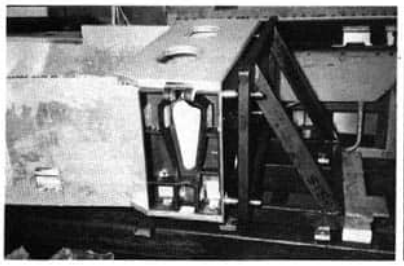
Suspension designed for radial tire or bias ply tire technology.

Extensive "driver protection" design. Impact protected location of critical components.

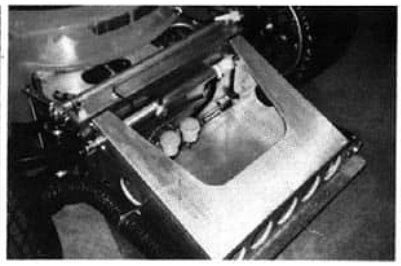
Further refinement of the wind tunnel and track tested and developed body, wing, and ground effects.

Adjustable rising rate suspension, allowing for the creation of increasingly harder spring rates as loading increases.

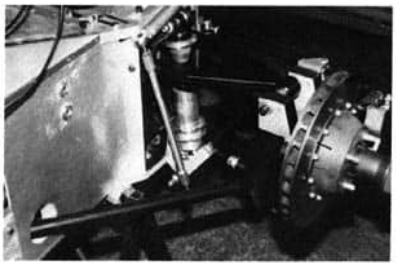
16" Wheels, allowing largest brakes, effective cooling, proper drive shaft alignment, and a wide selection of tire sizes and compounds.



Monocoque under construction, revealing magnesium suspension casting.



Progressively deformable honeycomb nose box.



Adjustable rising-rate pull rod front suspension.

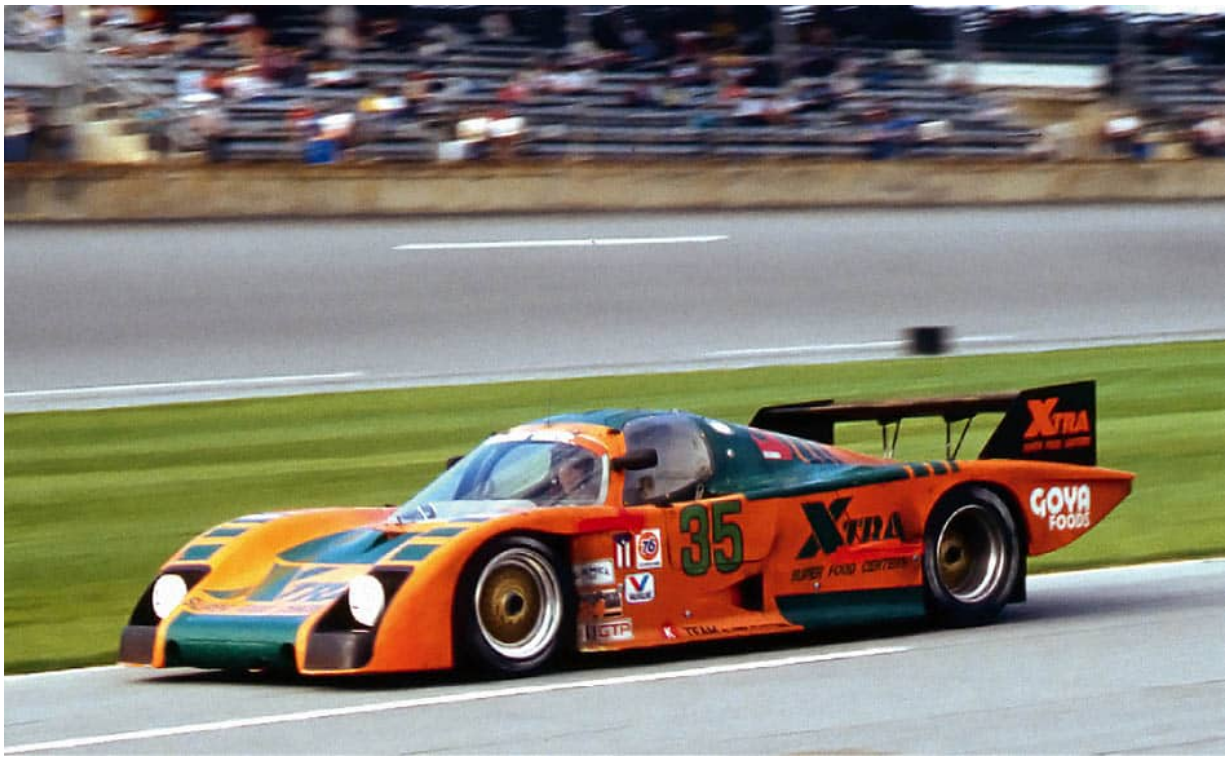
An English and American affair: here we see the sales brochure for the Royale RP40. (DM)

The engine in the RP40-1 was a Porsche 3-litre unit. It is said it was to run in Camel Lights, and was one of the first 'Lights' car to use an atmospheric Porsche engine. The car was ordered by Diego Febles and Mandy González, who together were DiMan Racing. Puerto Rican González acquired the car for the Camel Lights class, to begin at the 1986 Daytona 24 Hours. Here it was driven by González/Basilio Davila/Venezuelan Ernesto Soto and Colombian Diego Montoya, understood to be the uncle of Juan Pablo Montoya. Entered by DiMan Racing, it qualified way down the field in 63rd place, but came home in 9th overall, and 2nd in the Lights class.

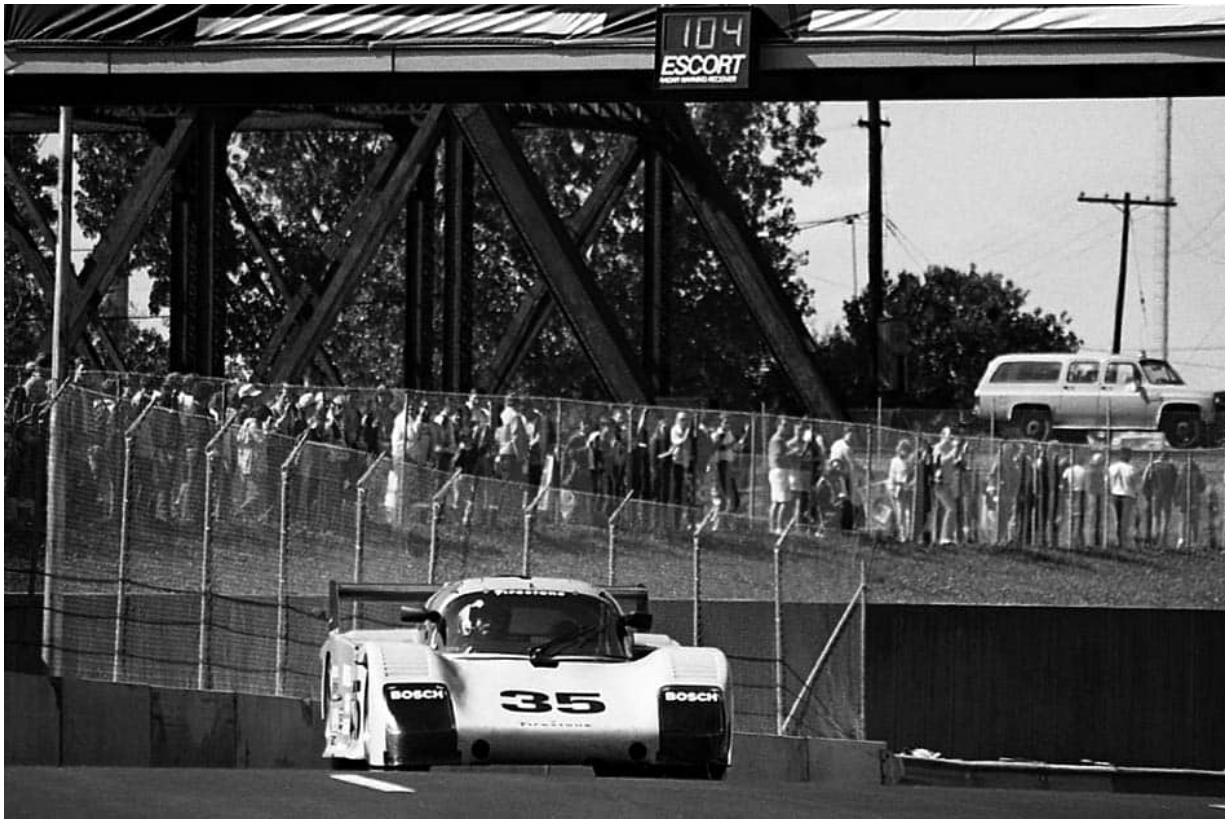
Royale RP40-1 JQF Porsche didn't race that often, but we do have a record. It next raced on 2 March 1986 at the Miami Grand Prix,

where Mandy González/Chris Marte finished 18th from a grid slot of 27. It was next seen at the Columbus 500km in October 1986, where González/Soto had a dnf. At the Miami Grand Prix in 1987, González/Manuel Villa finished 18th overall, followed by a 25th overall at that year's Sebring 12 Hours on 21 March. In 1988 at the Daytona 24 Hours, the 35 car went out with suspension failure on lap 302. Mandy González/Manuel Villa/Skip Winfree/John Schneider were the driving team.

At the 1989 Daytona 24 Hours, it was another dnf – an engine malady on lap 349 – the driving crew this time being Mandy González/Manuel Villa/Tato Ferrer/Ronaldo Falgueras. After this the records are pretty thin, but the car still exists today, as seen here.



Royale RP40-1 JQF ran at the Daytona 24 Hours on 2 February 1986, finishing 9th overall, 2nd in the Lights class: Mandy González/Ernesto Soto/Basilio Davila/Diego Montoya. (MS)



Columbus 500km, running in the IMSA GTP Lights class in October 1986: González/Soto 25th on the grid, but out on lap 51 – dnf. (MW)

5 February 1989: the RP40-1 JQF, with a modification to its bodywork and livery at the Daytona 24 Hours. It was a dnf on lap 349 for Mandy González/Manuel Villa/Tato Ferrer/Ronaldo Falgueras. (MW)

At a present-day 'vintage' gathering at Daytona. (DM)

LOLA-Porsche – Part 1

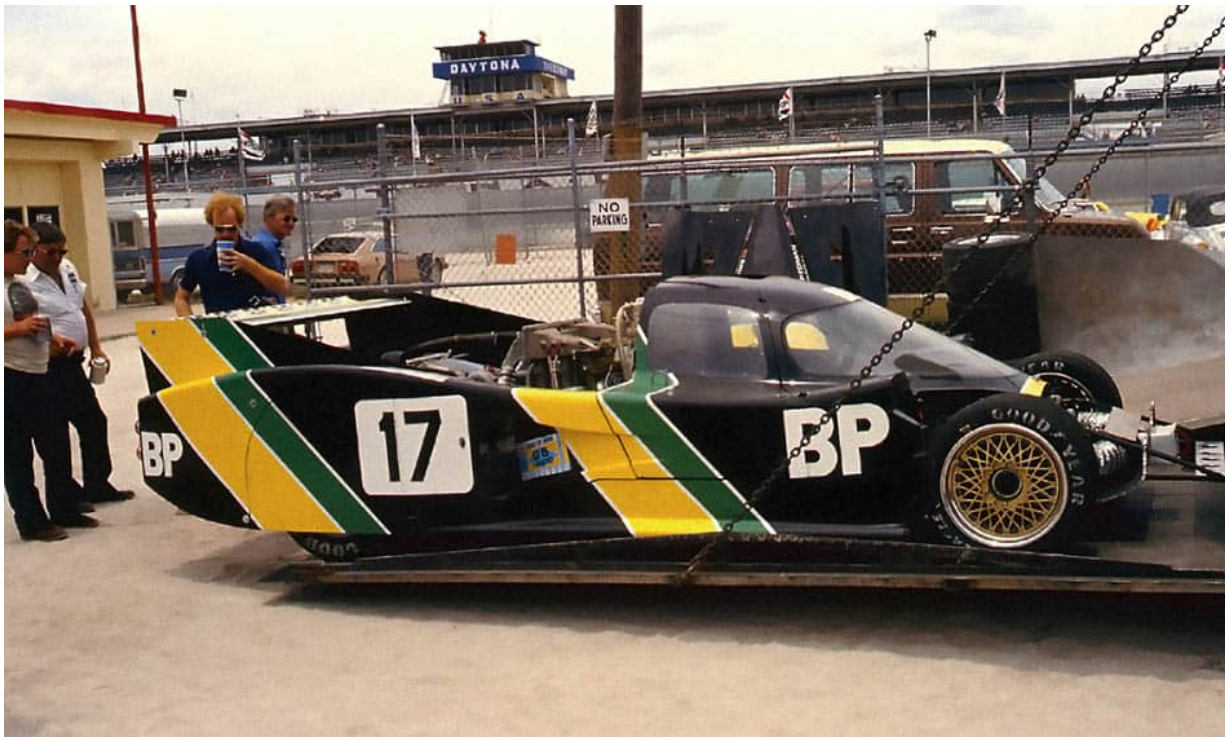
We first see a Porsche engine in a Lola when Cooke Woods Racing in the USA got hold of a Lola T600 HU1 for racing in the IMSA series in 1981, running with Chevrolet V8 power. Cooke Woods Racing also acquired a Porsche 930/72 2990cc – the 935 turbo engine – to run in the car at Le Mans in 1981.

The team had lined up a couple of serious hitters in Bobby Rahal/Brian Redman, but the drivers must have looked worried when, on arrival at Le Mans, they were faced with the sight of the engineers fighting to install an engine that was not fitting in its place in the car. It was clear to see the car was not ready, and in fact Cooke Woods Racing was in a bit of a state.

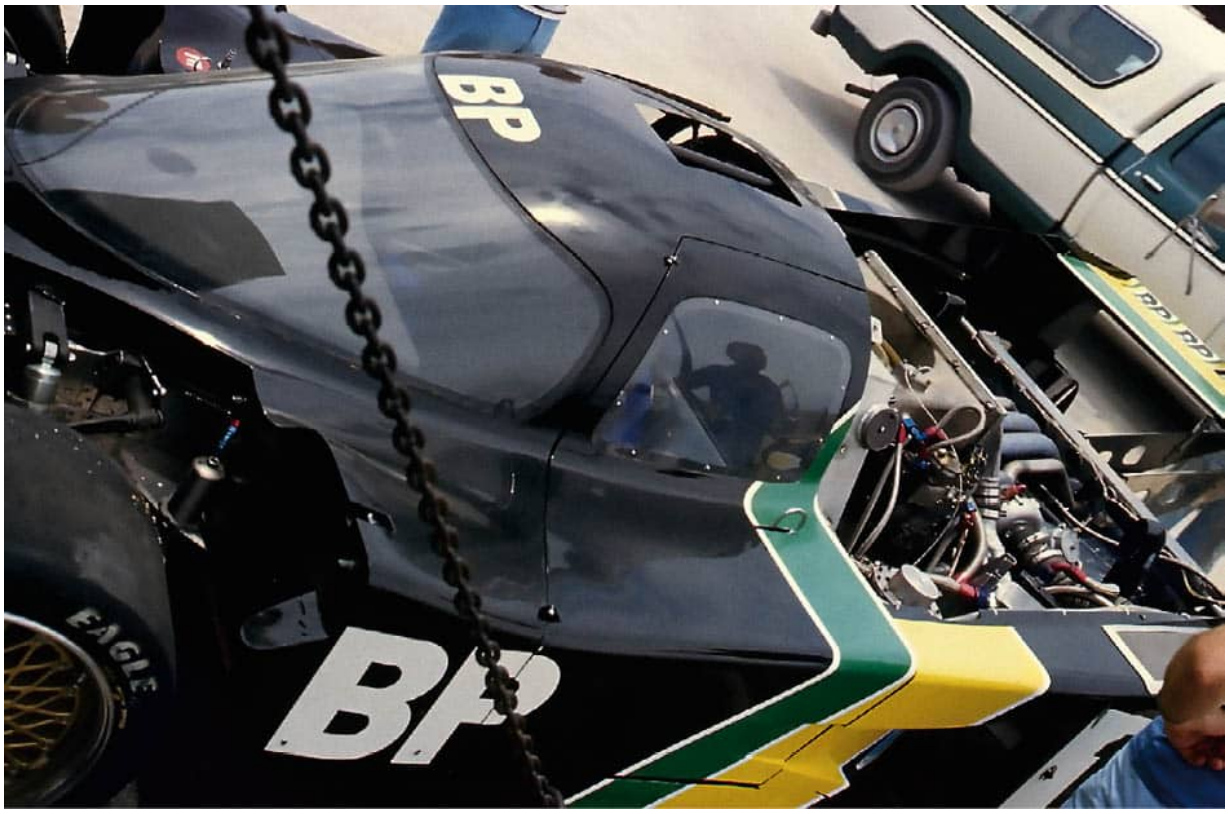
When practice started, they were going nowhere. To their credit, the mechanics kept at it, and eventually got the engine tied in, but it

was in a position that caused the engine to poke through the floor, thus destroying the beautiful aero that Lola had designed underneath – the reason why they had the car in the first place. Eventually Rahal/Redman got it out on track, but with a lap time of only 4min 18.3sec (against the pole-sitting 936's 3min 29.44sec), it was just too slow. The car was packed away and the team went home! The team returned to the 5.7-litre Chevrolet to race in the USA at the Road America 500 Miles in August.

It would be two years before anyone tried a Porsche engine in a Lola again. On 27 February 1983, Bruce Leven's Bayside Disposal team rolled out its T600 type HU8, fitted with a 935 engine. Bruce Leven/Al Holbert/Brian Redman drove it to 11th overall from 28 on the grid at the Miami Grand Prix. Running again at the Riverside 6 Hours, Bruce was joined by Hurley Haywood to qualify 15th, and finish 9th overall. At Laguna Seca, Hurley Haywood drove alone, from 7th on the grid to 4th overall. At Brainerd he had a dnf from 7th on the grid, and the same again at the Sears Point 3 Hours, but this time from 5th on the grid. At the Portland 3 Hours, Bruce Leven was back with Haywood, but they were not able to get the car anywhere high up: having qualified 5th, it showed a good turn of speed, but problems through the race meant only a 19th-place finish. The car then seems to disappear off the radar, at least with a Porsche engine fitted. We return to Lola in the next chapter with Champion Racing.

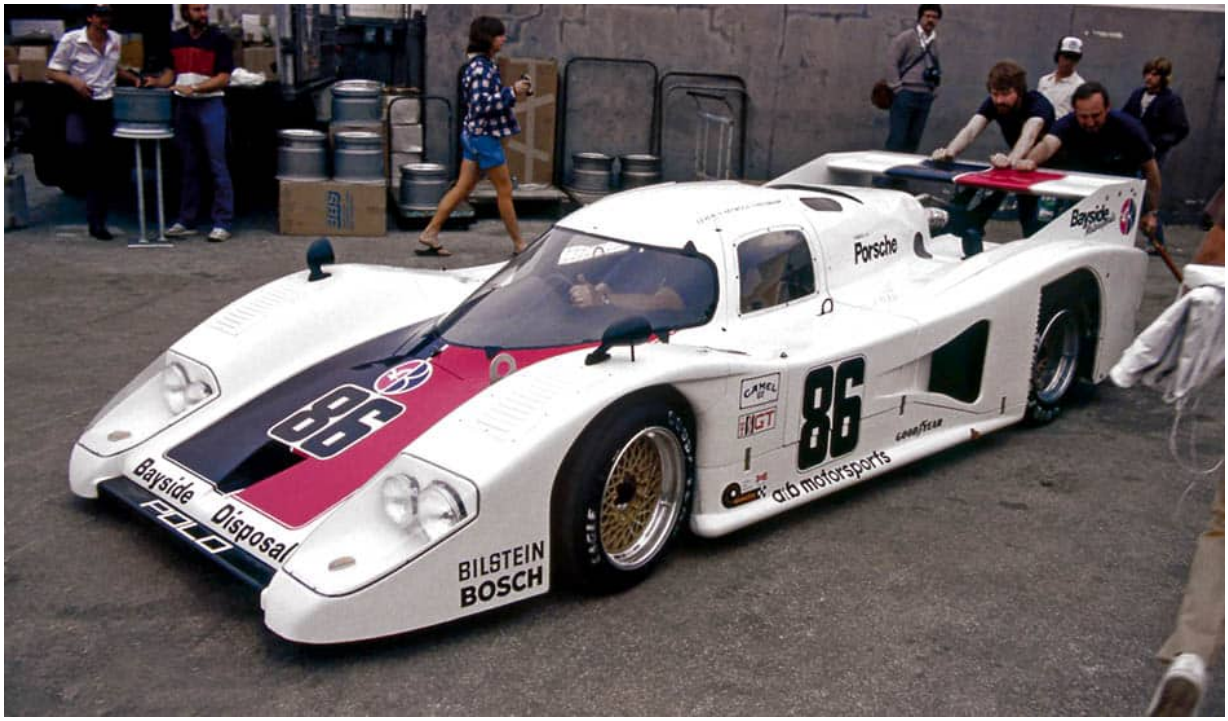


Lola T600 HU2: Cooke Woods Racing ran an HU1 Lola T600 in IMSA in 1981 with a Chevy V8, but here we see a test at Daytona with a Porsche 930/72 2990cc 935 turbo engine installation. (MS)



The twin turbochargers can be seen at the back of the car. (MS)

Le Mans 1981: a rare sight of the Lola Porsche on track. Eventually Rahal/Redman got it out on track, but with a lap time of only 4min 18.3sec (against the pole-sitting 936's 3min 29.44sec), it was just too slow. The car was packed away and the team went home! (AJFR)



The 1983 Lola T600 HU8, powered by the 930 engine found in the 935s of the period. Bruce Leven's Bayside Disposal would run the car. (MS)

♦ ♦ ♦ ♦ ♦

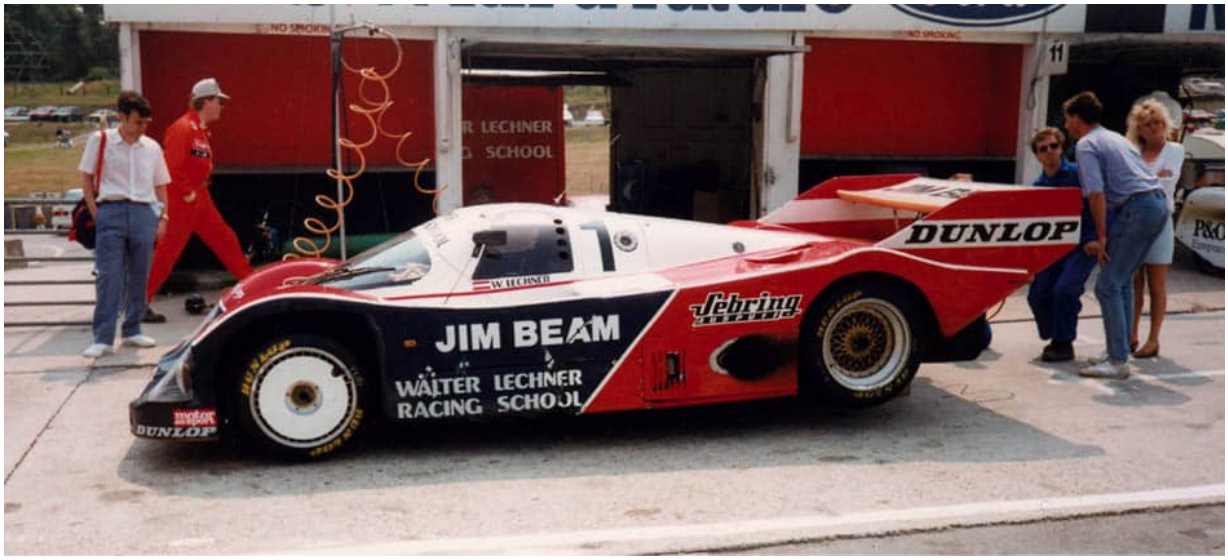
Walter Lechner Racing School-Porsche

Before we leave the 1980s, we must not forget one other team using a Porsche in its 962 Thompson-chassised example 962-WLM01: Walter Lechner Racing School. 962-WLM01 was first seen on 26 April 1987 at the Nürburgring. Lechner, an Austrian, put Franz Konrad in the driver's seat. A second car, known as the WLM02, also appeared, but in later years. Lechner frequently drove alone, and had several podium positions in the coming years. The WLM01 is listed as running on four occasions in 1987, achieving a 6th in its debut race at the Nürburgring Supercup meeting, its drivers being Franz Konrad/Walter Lechner. On 28 June at the Norisring, it dnf'd due to driver fatigue! On 5 July at Hockenheim, it dnf'd again. 2 August at Wunstorf it was car #3 and finished 5th. On 16 August it came 3rd overall at the Interserie round at Most in Czechoslovakia, Lechner

driving alone. On 23 August, Lechner pulled off a victory in the Interserie race at Siegerland, round six of the championship. Then at the Interserie round at Zeltweg on 11 October, Lechner again demonstrated his ability, finishing 2nd overall. He then spread his wings to go to the Kyalami circuit in South Africa for the Kyalami 500km, his co-driver being Ernst Franzmaier; they finished 5th overall. All the entries were made by the Walter Lechner Racing School.

In 1988, Walter Lechner would win the Interserie Championship over eight counting races. One record shows he was driving chassis WLM01 and another the 962-118. The author has not been able to establish clearly which cars were which. What is clear, however, is that the WLM01 came out again in 1989 to participate in four races: the Silverstone Super Cup, where Lechner came 3rd overall; the WSPC at Dijon, where he was 12th; the Norisring Supercup, where the car experienced its only dnf, which was due to an ignition problem; then, at that year's Most Interserie round, it was 5th overall. Lechner had a second 962 Thompson chassis, numbered 152. Chassis 152 is listed as the final chassis of the 962 series built by Porsche, according to information from Jürgen Barth, so it is an assumption only that the Thompson 152 was a replacement chassis. The 152-chassised car would win the Interserie round at Brands Hatch on 22 July 1990 in the hands of Walter Lechner.

The Walter Lechner Racing School 962 Thompson-chassised WLM01, seen here at the Siegerland Interserie race. The car was first seen at the Nürburgring on 26 April 1987. A standard 962 2994cc twin-turbo powered the car. (P)



2nd on the grid: the Walter Lechner 962. Winner of both Heat 1 and Heat 2 at the Brands Hatch Interserie round, 22 July 1990. (JS)

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Holbert/Fabcar/Dawe-Porsche: the Carrera 924/944s

Plans had been laid down in Porsche Stuttgart on 4 December 1978, for a series of front-engine 'kit' race cars. In Europe on 4 April 1979, the turbo version of the water-cooled 924 had been approved by the FIA and CSI. The turbo car would not go to the USA until later, although turbo components would be used in the US Production D race cars. SCCA 'kit' cars originally had non-turbocharged engines, at first giving 180bhp at 7000rpm; the Audi-Porsche engine being used was enlarged to 2039cc from its regular 1984cc, with a compression ratio of 11.8:1, four cylinders and five-speed Porsche gearbox. 16 cars in kit form were made, carrying chassis numbers 92A0490001-16. Al Holbert built the first kits, and quickly started to create his own cars. He even wrote a booklet called *Driving the Porsche 924/924 Turbo in Competition*, produced in the USA to help prospective new teams come into the game.

The first Holbert-built car made its debut appearance at the Porsche+Audi establishment in New Jersey in September 1979, and would debut in a race at Road Atlanta on 27-28 October. However, that debut wasn't as auspicious as everyone involved would have hoped. Holbert's race driver, Doc Bundy, told the author: "The car we received in 1979 was an early version of the kit cars. We were supposed to be going to build up some cars, and Porsche was going to supply us with the parts. We had in fact already begun to prepare our own chassis from a bodyshell that Al (Holbert) had in the shop. We took the new kit car testing (prior to a national race), but Al crashed it! Holbert then built an all-new racing chassis, of course powered by Porsche, for 1980."

Driving the Porsche 924/924 Turbo in Competition

924

THE 924—WHAT'S IN A WINNER

If ever there were a production sports car ideally suited for competition, it's the Porsche 924.

The 924 is engineered with a fully-independent suspension, extremely light unsprung weight, rack-and-pinion steering and a sleek aerodynamic shape.

The weight distribution is near neutral (48% front/52% rear.)

The two-liter overhead cam engine comes with CIS fuel injection and a breakerless ignition system as standard equipment.

On the track, the 924 captured the 1978 Pacific Coast Showroom Stock A Road Racing Championship in just its first try.

In 1979 the car repeated that victory, won two SCCA Divisional titles and set the fastest qualifying time at the SCCA national championship runoffs. Wherever it runs, from Watkins Glen to Riverside, the 924 uses its racer-like handling, superior braking and quick acceleration to defeat cars with large horsepower advantages.

And on punishing rally trails, the 924's combination of flawless handling and durability makes it a winner as well.

Now eligible to race in SCCA's D and C Production categories as well, the 924 offers Porsche drivers three levels of entry to the excitement of road racing.

The Porsche Tradition. From the tiny 356 coupe that captured its class at Le Mans in its very first try, to this Can-Am-winning 917/30—the fastest race car ever built—the name Porsche has been synonymous with extraordinary automotive performance.

In fact, Porsches have probably scored more important racing victories throughout the world than any other marque—including seven World Championship of Makes, seven IMSA GT championships, eight SCCA Trans-Am titles, and seven overall victories at the 24 Hours of Le Mans.

Today, that tradition continues with the 924 series Porsches—the 924 and 924 Turbo.

AL HOLBERT TALKS ABOUT THE 924

Looking back over my 10 years of competition driving, I would say that my most rewarding moments have been behind the wheel of Porsche cars.

I began my career driving a C Production 914 in SCCA club racing.

It was the Porsche Carrera that carried me to victories at Lime Rock and Road Atlanta, and earned me the STP Pro Rookie of the Year Award for 1973.

And most recently, I've raced the fabulous 935 Turbo in IMSA and Trans-Am events.

Today the Porsche 924 and 924 Turbo represent the next generation Porsche. These cars also represent an excellent opportunity for up-and-coming drivers to demonstrate their ability on the race track.

As a matter of fact, I can't think of a more sensible, cost-effective way to break into GT racing than to begin with Showroom Stock racing in a 924 and then move into the D or C Production categories.

Al Holbert

Al Holbert

Driving the Porsche 924/924 Turbo in Competition – the booklet written by Al Holbert. (RS)

The Doc Bundy 924 Production D Holbert Racing-built race car, the top chassis of 1980. (P)

A smiling Al Holbert, with Norbert Singer looking on, Daytona 1981. (TS)

In the hands of Doc Bundy it competed with sufficient aplomb to win at the Road Atlanta finals on 20-26 October 1980. Holbert would race for the Porsche factory team at Le Mans in 1980, and the following year acquired the Carrera 924 GTP car that he had raced there.

The Holbert team had by this time been building various other race cars for a number of years, the Holbert CAC CanAm cars being of particular significance. They used Chevrolet power, so are not covered here, but it's important to be aware that the Holbert Company was, by 1980, in the very big league. We have already seen earlier in this chapter his influence that would come later with the 962s. Holbert would significantly modify and enter the former Le Mans chassis 003 for fellow drivers Rick Mears/Doc Bundy at the 1981 Daytona 24 Hours.

Tom Seabolt, who was with Al Holbert for ten years, says: "For 1981 we had a plan that we would run a 924 GTR Turbo in the

TransAm Series. Al had done a deal with Porsche, and the Porsche factory shipped over that first car which had run at Le Mans, the one Al had driven with Derek Bell. We significantly modified and updated it, and prepped it to race at Daytona, then planned to use it as a baseline for a car for our TransAm programme."

On 14 June 1981, Holbert entered another new, all Holbert-built car in a race at Lime Rock. It was the first of the 'new' non-factory Carrera GTRs, part 924 tub, part tube-frame.

"Some time that year it was decided that Holbert Racing would build a 'from the ground up' tube-frame 924 to race in TransAm in 1982. A deal was made with Bruce Levens Bayside team, through which he would buy both the first new chassis and the Le Mans car to race in 1982. We would forgo the last race, maybe two, of the 1981 season, prep the cars for Leven and would run the last one or two 1981 TransAm races with these cars."

On the banking at the 24 Hours Pepsi Challenge at Daytona, 1981: the Al Holbert former Le Mans car, much remodelled, repainted and now racing in the USA. (BO)

The new all Holbert-created 924 Carrera GTR included many updates with then-current technology intercooler and pipework, together with enlarged and re-shaped bonnet and wings. Here it runs ahead of the Bard Boand Flying Tigers Corvette at Lime Rock. Greg Pickett in a Corvette took the top spot, but Holbert/Bundy finished 2nd and 3rd overall of the 34 cars that started the 100.58-mile race. (BO)

Tom Seabolt says: “We prepared two GTR racers for Bayside Disposal. Here we see the Holbert 1981 TransAm car that had been Doc Bundy’s No 14 car up till now. The other is another new Holbert GTR. They’ve been prepped and painted for delivery to Bruce Leven’s race team. They would run these cars for most of the 1982 TransAm season.” (TS)

The Al Holbert 1982 tube-framed car, designed by Lee Dykstra. Doc Bundy would drive. (BO)

During 1982 a super new all tube-frame car was being planned for 1983. Holbert crew chief Tom Seabolt: “The new first tube car ran the remaining TransAm races and the old Le Mans/Daytona car sat in the works, except for doing a Kendall Oil commercial in the summer. The tube chassis of the new Holbert car was being designed by Lee Dykstra. Little known outside of the USA, Dykstra was and is a legend when it comes to chassis design.”

Tom Seabolt says: “The 1982 car was designed by Lee Dykstra, and built in our workshop. The first race of the year was Road Atlanta. The car ran okay, but was getting beaten by the Leven car driven by Hurley Haywood. We were struggling with a brake problem where the pedal would go soft, and I couldn’t figure it out. Early in the race, Bundy came up the back straight to the bridge before the last corner, had no brakes, and hit the abutment. End of our race, and we

went home with our tail between our legs. Next up was a four-race west coast trip starting at Sears Point (now known as Sonoma Raceway). Doc Bundy won, much to everyone's surprise. The next week was Portland. Another win, this time it wasn't due to luck. We didn't win any more races, but did finish 2nd in the Championship. The final race of the year was at Sears Point, where we finished 2nd to the Tom Gloy Mustang. Doc Bundy would finish 2nd in the 1982 TransAm Championship with this car." Tom Seabolt continues: "With another fresh car being planned for 1983, we got to building over the winter of 1982 a super all tube-frame machine.

"Early in 1983, Al Holbert wanted to go sports car racing and, whilst he could not get a new 956 Porsche, he decided to get involved with March Engineering [see March section previously in this chapter]. They had built a sports prototype to the GTP regulations, with a Porsche flat-six turbo motor. Of course, the Porsche 956 was not legal in IMSA because of where the driver sat relative to the front wheel centreline."

The finished article, 1983: Holbert 924 tube-frame car as it was first tested at Pocono Raceway, prior to delivery to Paul Miller. This is the car that Paul Miller ran for a number of years in TransAm with Lee White as his crew chief. (TS)

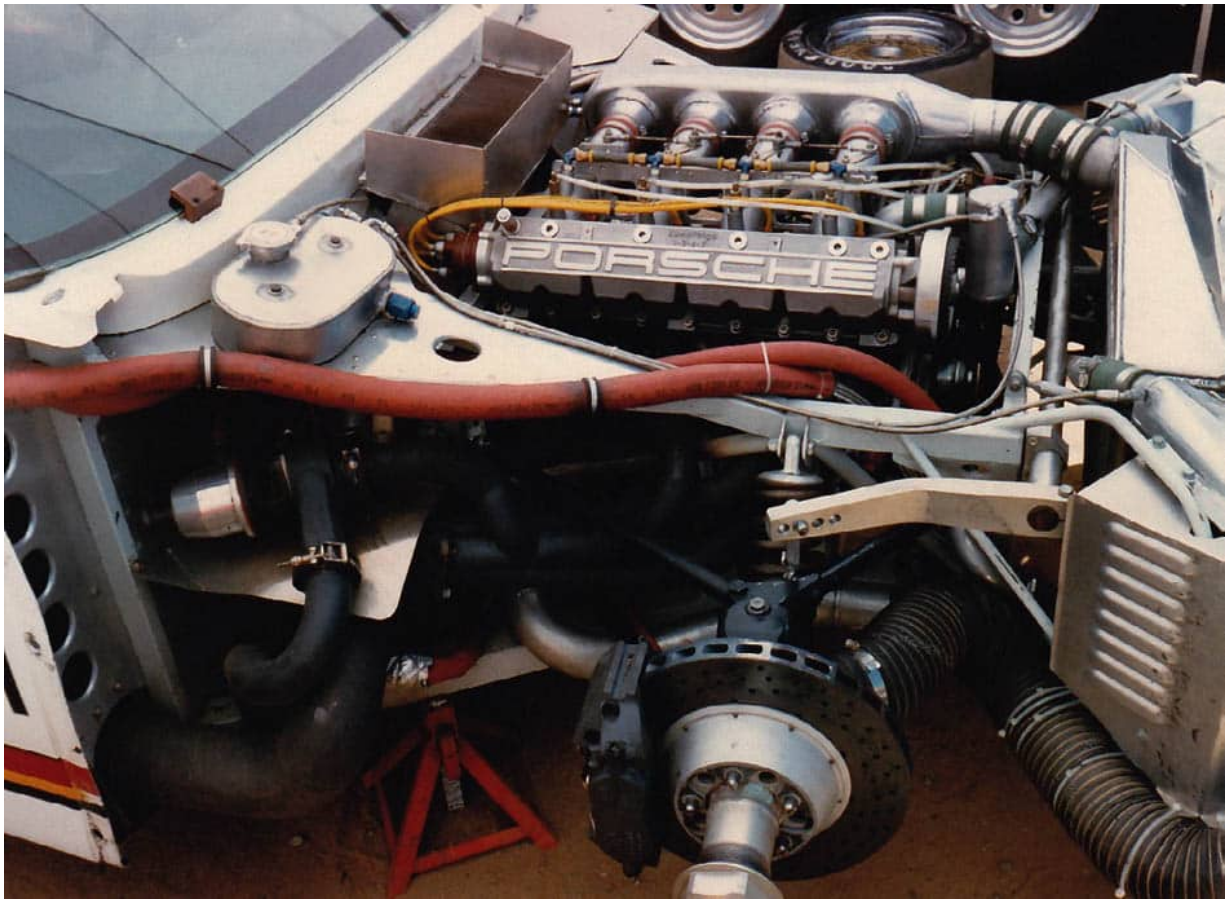
Doc Bundy: “The programme with the Porsche 924 tube car fell through at the last minute for TransAm in 1983. Al called and told me the car was ready to go (finished) but the support had been pulled; he was going to sell the car to Paul Miller. That old 924 Carrera was a good design with impressive handling.”

Paul Miller had sold the 924 chassis 006 of the Porsche production run of 924 GTRs that he raced in 1981 at Daytona and Sebring to Tom Winters’ Whitehall Promotions team. (Note: this car had a huge crash, and Peter Dawe installed the original mechanical parts into a tube frame car which was also fitted with the original chassis plate. The crashed remains of the original chassis, which included everything behind the front bulkhead, had a new front end and replacement mechanical components, but no longer the 006 chassis plate. Both cars still exist today, one of them in the UK.) Tom Seabolt

again: “We sold the new Holbert-created tube-frame 924 GTR we had planned for 1983 to Herman+Miller in the spring of 1983.”

Paul Miller says: “We picked up the TransAm car that Al Holbert’s boys had built under Lee Dykstra’s supervision. It had the Porsche-Audi engine. Lee White, our Miller team engine expert, started extracting some serious horsepower.” To run a 924 GTR successfully, more power was really a must. In addition, the MacPherson strut front suspension, whilst okay for the road, was not the ideal solution for racing.” Paul Miller continues: “There’s a big difference between the 1981-82 cars and the other stuff that we raced in ’83, ’84 and ’85. We now had to compete against Cameros and Pontiac Firebirds making 600bhp, and we had this little 2-litre engine that was making around 500bhp max sometimes, so we were way down on power. The only way we could really compete was to have the TransAm and Sports Car Club of America people agree to let us run a much lighter weight.” Power-wise, Al Holbert had started utilising the services of one Wiley McCoy, of McLaren Engines in Detroit, to improve on the power unit. The Sears Point Motorcraft 100 saw the new tube-frame 924 GTR acquired by Paul Miller from Al Holbert, now carrying his regular No 36 and painted blue. Miller took the car to 17th overall on its first serious outing.

The new, dark blue No 36 Herman+Miller car, the project Holbert car originally prepared for TransAm and Doc Bundy; note the bonnet scoop has gone. (PM)



A four-cylinder McLaren/Porsche Wiley McCoy-type engine installation similar to the ones on the Holbert cars, pre Andial. (VO)

Tom Winters in the new Peter Dawe-chassised No 79: 17th overall, 9th in GTU at the Sears Point IMSA GT race. (TW)

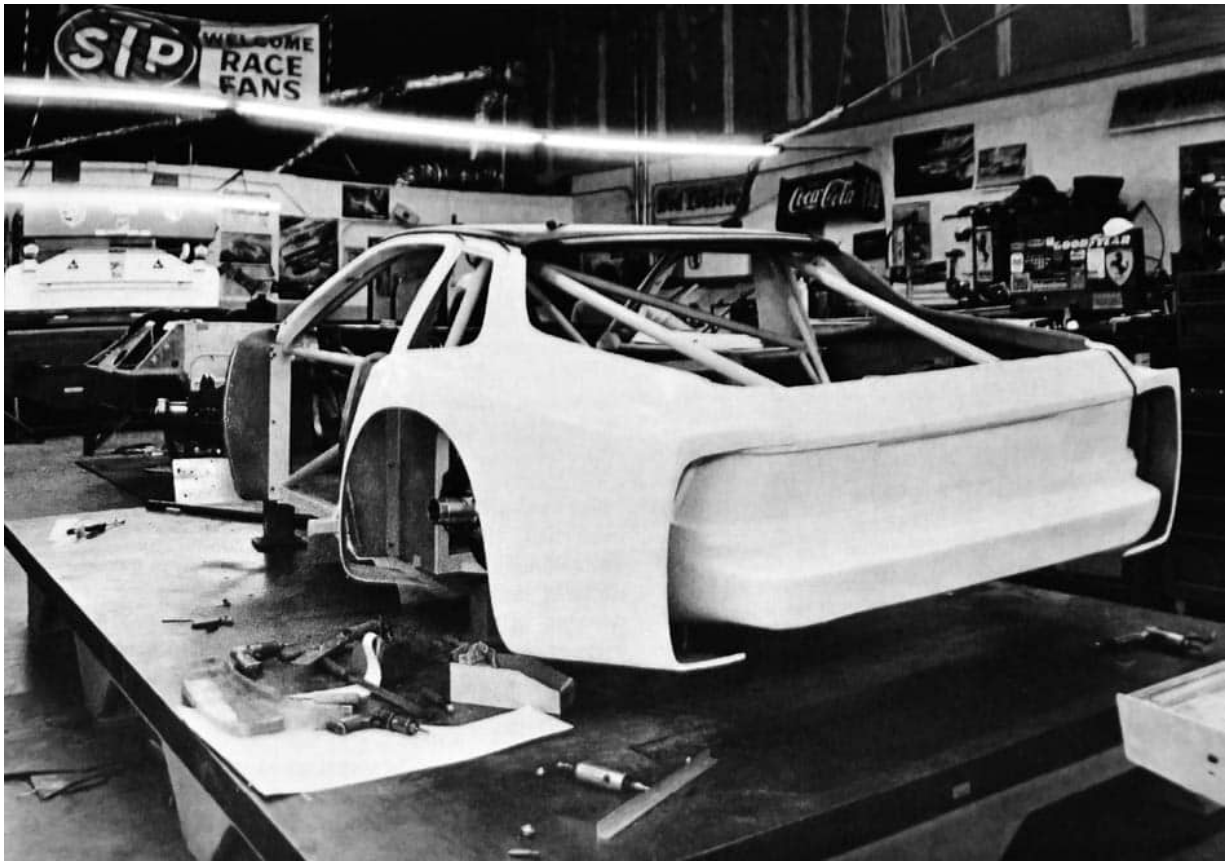
No 79 as it is today. Tom Winters was one of the first of the team owners to go to all lightweight chassis. This is a Peter Dawe-created GTR Carrera 924/944 of 1983-1984, restored in 2013 by Reiner Telkamp. (RT)

As the reader may see, at this stage the 924 Carrera is now a pure built-in-the-USA creation. We enter a period that takes the 924 Carrera shape into an area perhaps not in the original planning of Porsche in Stuttgart. By 1983, the Porsche factory team had moved on to the evolution of the 956, and eventually the 962 for Sports Prototype racing. In Europe there appeared to be little desire to develop the GTR design further; it was now seen as getting long in the tooth. Also, the classes of racing were of limited interest to European racers. In the USA, however, in the professional racing world it was a different story. IMSA GTO/GTU catered adequately for these cars and in the SCCA series TransAm was very popular, and replete with the crowd favourites, the big American V8s. Tom Winters would have a new car created, heavily influenced by Peter Dawe.

Bob Bergstrom, regular co-driver of Tom Winters, said of the new car: “Its first outing for me was at Watkins Glen in 1984 (8 July). My new car had the 2.5-litre Andial engine: a 944. In practice, it was amazing how much better the new car’s handling was. One particular episode stood out. Going into the very fast downhill first turn, which anybody who has raced at Watkins Glen knows is a ‘suck it up’ type of turn, the throttle cable stuck momentarily, which created instant anxiety – I went through that turn probably 10-20% faster than at any time previously in any other car. A real eye opener.”

The 1985 version of Paul Miller’s 924 GTR tube-framed US-built car was the result of a ground-up reconstruction at the Dave Klym Fabcar workshops. Dave Klym says: “Yeah, that’s right – pretty impressive car. I replaced the existing suspension with a new double wishbone set front and rear. Testing at Laguna Seca, Paul Miller took 4sec off the old lap record and went 2sec faster than he had ever gone before. In fact, when word got out of how quick it was going, we were asked to build more of the tube-frame chassis for what would become the 924 and 944 GTR TransAm cars. The engines in the period were, in the beginning, 2.5-litre from McLaren Engines and, of course, Wiley McCoy. Later they were coming from Andial.”

The new cars built by Fabcar were coming thick and fast, as Bob Bergstrom relates: “Memories fade over the years, but I am pretty sure in 1985 we ran a new blue Fabcar at Watkins Glen in practice.”



1985: a new superlight space-frame silhouette 924/944 GTR created by Dave Klym was on the cards, seen here in the workshop. (P)

Paul Miller ready for a shakedown run at Firebird Raceway, spring 1985. (LW)

Car No 36 was to be so fast, the race organisers at Sears Point in 1985 impounded the car over the Saturday night to check it out. Finding nothing contravened the rules, bizarrely, they imposed a weight penalty for the race! (LW)

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Fabcar-944 Porsche

Dave Klym, boss of Fabcar, says: “When word had got out of how quick Paul Miller’s 924 was going, we were asked by Porsche+Audi USA to build more of the tube-frame chassis for what would become the 944 GTR TransAm cars. Al Holbert was involved all the way and we eventually made seven of these cars. For the GTRs, 001 and 002 it is thought went to Ludwig Heimrath and Paul Miller; 003 and 004 went to Alan Johnson – he had the first red one; Bruce Jenner had 005 and 006; 007, being an IMSA car, went to Holbert then Chester

Vincentz and the Electrodyne team. When we built those special seven, each time a car was finished, Al Holbert, keeping an eye on it all, would jump in his plane and fly down to us to test it, then fly back. It was the same plane that he eventually lost his life in."

A new 924/944 Fabcar in practice at Watkins Glen, 1985. Bob Bergstrom says: "It was a completely new car that had all the modifications on the suspension. The rear wing is different from the original spoiler on the earlier car. It was extremely quick and handled better than the previous car." (TW)

The final incarnation: the 944. Paul Miller: “Once we got the Andial 2.5-litre sorted, we were getting 700bhp+ from that engine in the new car.” (DK)

The 944 GTR created by Fabcar for Alan Johnson. (VO)

Here we see the 01 944 GTR for Ludwig Heimrath Jr. (VO)

The Carrera GTR was about to reach its ultimate development. “The engines in the period,” says Dave Klym, “were now 2.5-litre Porsche six-cylinder (as in the 944 street model) from Andial. Andial founder Alwin Springer told the author: “Al Holbert was driving the idea, and I got on to Porsche Weissach to organise it all. Weissach would supply us with the 944 crankcase – just roughed out, not completely machined – and the unmachined cylinder head as castings, and then we would finish the machining at Andial, preparing everything, assembling the engine and testing it. The engines were built by an absolute wizard: Drino Miller. We developed the Bosch MP 1.2 electronics on that 944 engine. We had started out with a Kugelfischer, but in 1985 we went to the electronic Bosch. We made most of the other special 944 parts here in the US. The New Zealander, Bruce Jenner, funded a development programme, too. At Andial we took charge, with Drino running the show for all the testing

at the clients' works, like Dave Klym's or Max Crawford's place. Andial was a completely independent company – the relationship with Al Holbert came when he became head of Porsche Motorsport North America, and he gave us the order to build the 944 engine. Some components did come from Porsche Weissach, but most of what we did we sourced in the US. I took over from Al at Porsche Motorsport at the end of 1989 until the end of 1996, when I resigned at Andial and became full-time president of Porsche Motorsport North America." The US 'sorcier,' Alwin Springer, continues to work as a consultant to Porsche North America today.

The Andial 2.5-litre installed in the Ludwig Heimrath car, 001 of the seven Dave Klym-built chassis. It would take a while to sort out. (DK)

Elliott Forbes-Robinson in the 944 GTO gave the Roush Merkur/now Lee White-run team a few heartaches in 1987. (MW)

The 005 and 006 Klym Fabcar chassis 944 GTRs would run in TransAm in Olivetti colours (white and burgundy). The 005 chassis driven by Elliott Forbes-Robinson had race No 11, and Bruce Jenner drove the 006 chassis (race No 42). Tom Seabolt picks up the story: “In 1987, New Zealand racer Bruce Jenner (not to be confused with the US Olympic athlete of the same name) stepped forward. He wanted to run a two-car team with Max Crawford in TransAm: one for him, and the other for Elliott Forbes-Robinson. The benchmark was Roush Racing and its two-car Mercury Merkur team, which would win nearly every race. But EFR won at Brainerd TransAm on 19 July 1987 and the two cars were on the podium many times.

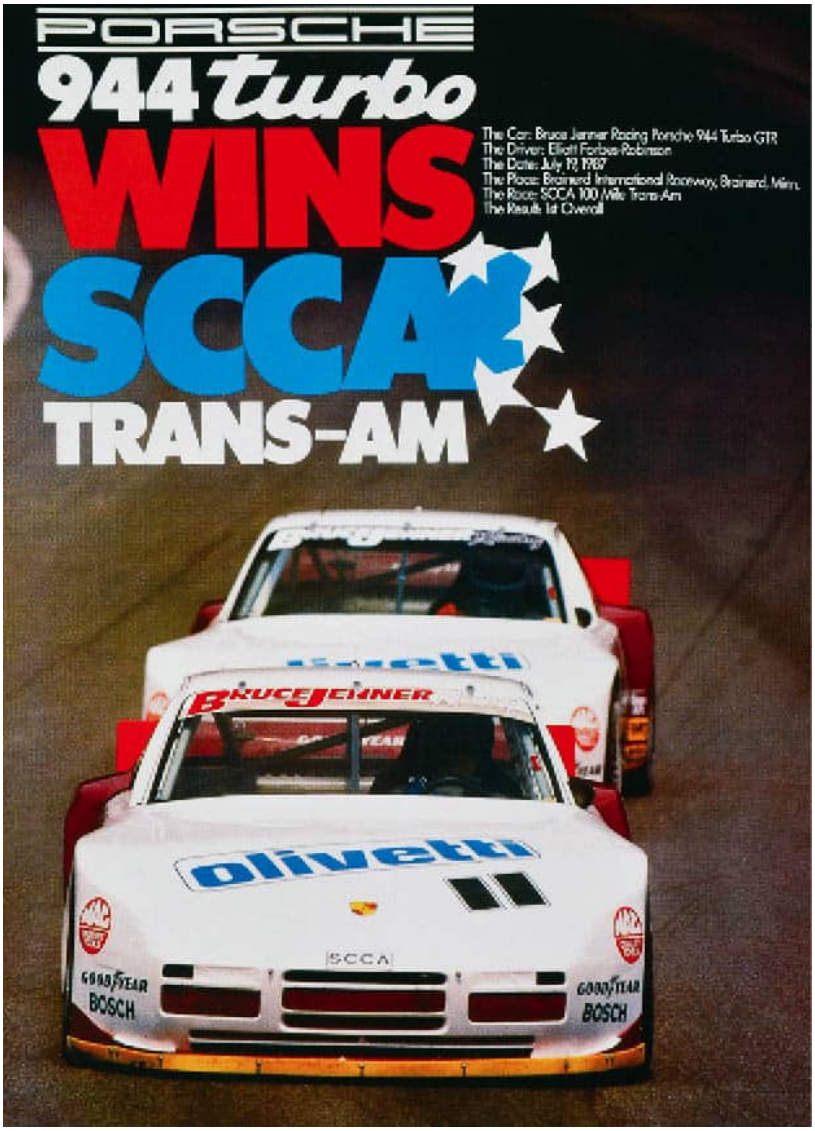
“In mid-1987, Al Holbert decided to bring the 07 Fabcar Klym chassis in-house to do some testing. The focus would be IMSA GTO. We did a number of tests with EFR driving and Chester Vincentz (Electrodyne) who bought the car in December, but did not race until later in 1988. Through 1987 Elliott Forbes-Robinson had got on the front row of the grid six times in 11 races with the Andial-powered

944 Carrera, taking one victory, three 2nd places, two 3rd places, and a 4th, with a few lower positions thrown in. Remarkably, the car recorded no non-finishes and by this record alone was probably the most reliable of all the GTRs."

Chester Vincentz, mentioned above, campaigned the GTO throughout 1988 and into 1989 with mixed results, his best a 9th overall at 1989 Watkins Glen GTU/GTO International race on 24 September. Several dnfs followed and the car was parked up.

We leave the final words on this era to Elliott Forbes-Robinson: "During the 1987 season that we ran the car, we had to do a lot of development; but the problem we had most was the engine management: we would have won more races if the electronics had worked better. We were leading at Mid-Ohio, also Sears Point, and had a chance to win at Kansas when we had problems. At Sears Point the engine quit behind the pace car! At Mid-Ohio we had a suspension failure with, as I remember, eight laps to go. As to driving the car, it was a great car to drive; it was well balanced and had great brakes."

Chester Vincentz in the Electrodyne 944 GTO, tube-frame Fabcar 07. (MW)



The final fling in the top-level professional racing series and, as this advertising poster demonstrates, the 944 Turbo Dave Klym racers put on a good show against the Roush cars during 1987. (RS)

Chapter 6

May the force be with you! – the 1990s

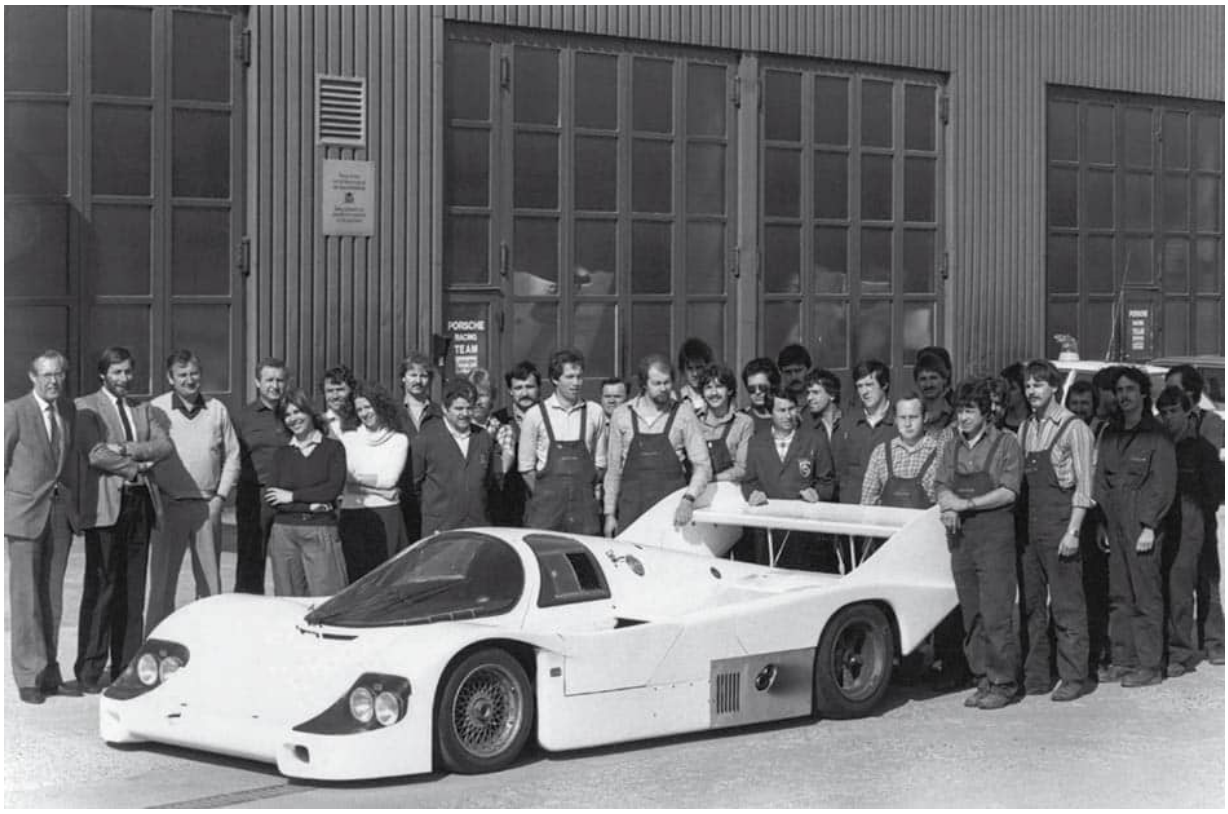
The 1990s were to see a scene of constant change and infighting within the hierarchy of the organising bodies. The arrival of 3.5-litre Formula 1 engines and numerous class changes added to the confusion. All of this is admirably covered in Janos Wimpffen's book, *Time and Two Seats*. Porsche, of course, did not have a 3.5-litre; furious discussions took place, the full details of which we dare not risk repeating here! But insiders told the author it wasn't pretty. Incoming president Max Mosley and his vice president of promotions, Bernie Ecclestone, were trying to get the Sports Car World Championship banned during the autumn of 1991. Porsche was no longer involved as an entrant by then, but as an engine supplier it was serious business. Mercedes withdrew, as did Jaguar. Much lobbying of the FIA eventually brought about a reprieve for the Championship. But if they had won a battle, the teams would lose the war, when in October, prior to the Magny Cours 500km, the World Motor Sports Council of the FIA decided to scrap the Sports Car World Championship as it stood. Le Mans, though not part of the World Championships, would continue to run every year into the future.

By the late 1980s, the 956 was almost obsolete, and the 962 was king. With this model we have seen the arrival of several alternative 'chassis tub' manufacturers, as discussed in the last chapter. These companies – TC Prototypes, Chapman Developments, Stickel and Fabcar – were all building monocoque tubs, some at first of plain aluminium, then in a honeycomb aluminium; later there would be carbon-fibre composites. Porsche sanctioned both Stickel in Germany and Fabcar in the USA to build 962 chassis with factory chassis numbers being applied.

Versions of the 936 tube-frame cars had seen efforts from Kremer

and Joest, independent of Porsche. Trevor Crisp (Katana Ltd) in the UK told the author that when he was working with Schuppan, it also had carbon composite chassis made by Advanced Composite Technology in the UK. We will see more of Schuppan Racing in this chapter. Aluminium honeycomb and mixed carbon-composite chassis would also come on the scene.

We are able to see listed many of the non-Porsche-constructed chassis created in the 1990s in a document from the Porsche archives. The author was told that the last pure Porsche 962 chassis that Porsche 'Werk' built was 962-152; however, the reader might notice that there is no 153; this is because it was a spare, and renumbered in April 1990 as chassis 962-013. Some records also show that 152 was a Thompson chassis, indicating that maybe the Thompson 152 was a replacement chassis for the original. Note that while every effort has been made to check the facts relating to chassis numbers, we cannot be 100% sure of total accuracy. It is well known that chassis plates and identity documents were moved around by teams from car to car, to keep the racing team operational, and regulations at some country borders meant that it was important for the identity of the car to match the international carnet documents.



The full 962 build team (as it was in 1983). On the far left we see Peter Falk (Racing Director), Jürgen Barth (Customer Racing Manager) and Norbert Singer (Chief Engineer), outside the Porsche works in Weissach. (JB)

First we will look at the 962 chassis made by Stickel in Germany, and where they went:

Chassis number	Supplied to	First raced	Details
962 154 Porsche	Alpha Racing	Fuji 500km 11/3/1990	3rd at Le Mans 1990
962 156 Porsche	Joest Racing	Suzuka 8/4/1990	Chassis renumbered to 014
962 158 Porsche	Joest Racing	Le Mans 17/6/1990	Chassis renumbered to 015
962 161 Porsche	Lloyd/Italia	Le Mans 17/6/1990	Entered by Lloyd, 11th overall
962 165 Porsche	Salamin/Obermaier		
962 166 Porsche	Courage/Trust	Suzuka 14/4/1991	Sponsored by Nisseki

Our work here specialises in the non-factory-built Porsches. That said, several 962 chassis tubs, as they came on stream in the late 1980s and into the 1990s, were to be built into cars carrying factory

chassis numbers. This construction work was a continuation of the work done by the 962 team on the factory-built chassis.

As before, it may also be useful to see the engines coming from Porsche in the 1990s. In the USA, Andial would be building its own versions, based on the main components, such as the engine block, that were to come from Germany. Andial chief Alwin Springer had taken on the role of Porsche North America Motor Sports Competition Manager, relinquishing his post at Andial. We will see a lot more of the Andial Porsches in this period.

Year	Type	Cyls	cc	Cars	Power	Notes
1990	935/83	Flat-six	2994cc	962 last factory chassis	745bhp	
1990	935/84	Flat-six	3164cc	Chassis outside Porsche	760bhp	Fabcar /Stickel chassis
1990	935/85	Flat-six	2994cc	962	745bhp	
1990	935/86	Flat-six	3164cc	962	750bhp	
1990	2708/81	V8	2649cc	Indy Oval speedway	733bhp	For the Indy cars
1990	935/82	6	3162cc	962C Joest	800bhp	Built for the Joest Racing Team
1990/91	3512	V12	3499cc	FA12	660bhp	F1 Car Footwork Arrows
1994		6	3164cc	962 GT	600bhp	Winner 94 Le Mans Dauer-Porsche
1995			3600cc	911 GT2	480bhp	Kremer Car
1996			3746cc	911 Cup	305bhp	Carrera Cup Car
1996			3164cc	911 GT1 96	600bhp	2nd ov Le Mans
1997			2994cc	Joest-TWR WSC95	720bhp	Winner Le Mans 24 Hours 1996 and 1997
1998			3198cc	911 GT1 98	550bhp	Winner Le Mans 1998
1998			3600cc	911 GT3 Cup	360bhp	

Fabcar-Porsche – Part 2

We have seen in the 1980s period, the rise and rise of Fabcar, the company of Dave Klym. Fabcar had built cars for Indianapolis, the IMSA GTs and Camel Lights series, and Klym's expertise in chassis construction, tube frame and monocoques was developing rapidly. The Camel Lights cars would continue to race into the 1990s.

As we have seen, Fabcar had also built special chassis for the front-engine IMSA 924 and 944GT Carrera Porsches; in the same period, towards the middle and end of the 1980s, it had also been repairing damaged monocoque 962s, having also built a 956 monocoque (for Dr Siegfried Brunn, said Dave Klym), and 962 monocoque tubs for Holbert Racing. Dave Klym and Lee Dykstra had created several new designs, and improved existing ones for Fabcar,

including two four-rotor Mazda GT cars for the Mazda factory. Dick Diasio, owner of Putnam Park Racetrack in Indiana, asked Fabcar to create a small two-seater sports car, a tube-frame car which used a Yamaha motorcycle engine; it looked like a miniature 962 Porsche. The car was designated the D962. “Fabcar” says Dave Klym “built 30 of these cars.”

The mini 962s: D962 chassis had a Yamaha 1000cc engine and a six-speed sequential shift gearbox eligible for SCCA races. 30 of these cars were built by Fabcar. (DK)

Klym says he had even been invited over to Germany by Joest Racing in the latter part of the 1980s, to repair two of its Porsche-supplied monocoque chassis. The author was told that Porsche factory management got to know about this and became interested. By 1989, Porsche did not have the spare capacity to repair customer chassis, nor the time and space to build new ones. At the same time, it had customers clamouring for the 962 cars. Discussions took place

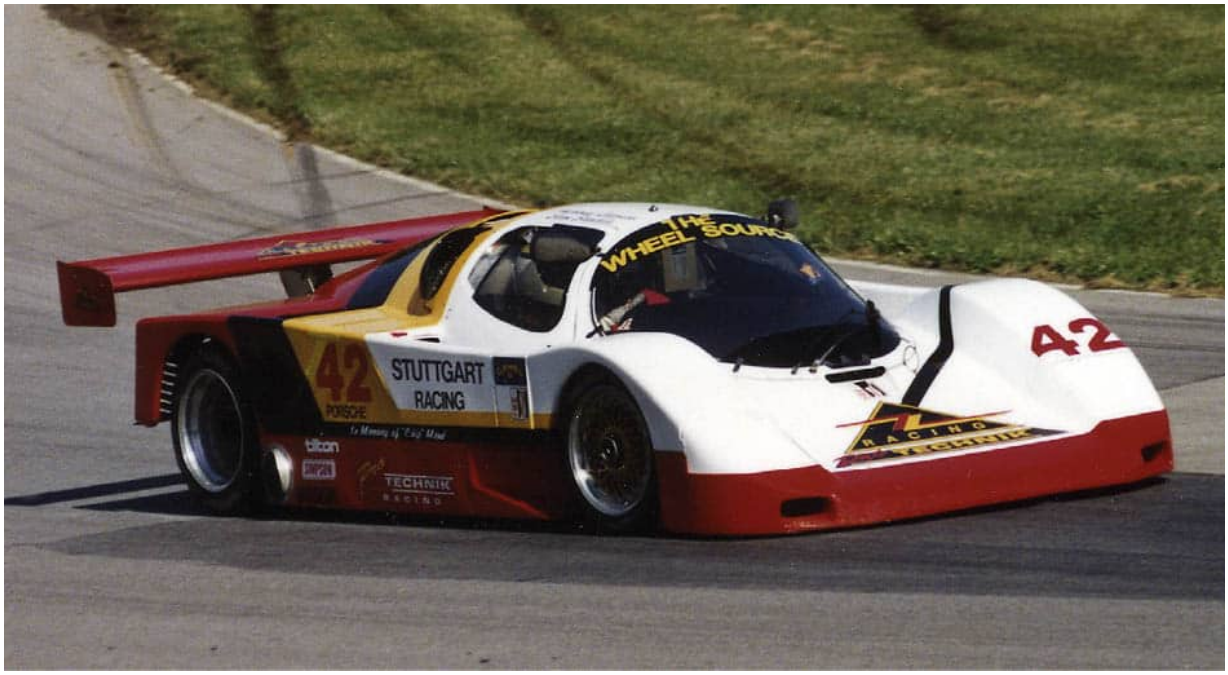
within Porsche which led to Porsche making an approach to Fabcar to build 962 monocoques for the factory, thus enabling Porsche to meet customer demand. The cars could be generally built up at Weissach Porsche, or by its clients, the chassis tubs to all intent and purposes being Porsche factory-supplied examples carrying Porsche chassis numbers. Fabcar also became the recommended 'go to' company for monocoque repairs; the company was already making a lot of suspension components for the 962, including some special steel uprights that the factory ran at Le Mans. The monocoque 962s built for Porsche by Fabcar were quality controlled by Porsche and were all built in 1990.

Chassis number	Car supplied to	First raced	Details
962C 155 Porsche	Obermaier	Suzuka 8/4/1990	Disqualified underweight
962C 157 Porsche	Salamin	Silverstone 20/5/1990	Gearbox failure dns
962C 159 Porsche	Trust (Japan)	Le Mans 17/6/1990	13th overall
962C 160 Porsche	Brun Motorsport	Le Mans 17/6/1990	2nd on grid Repsol car dnf
962C 162 Porsche	Kremer (Convector)	Dijon 22/7/1990	
962C 163 Porsche	Brun Motorsport	Montreal 23/9/1990	No 16 dnf accident
962C 164 Porsche	Nova (Japan)	500km Fuji 10/3/1991	10th overall
962C 165 Porsche	Obermaier (Salamin)	Nürburgring 18/8/1991	4th overall
962C 166 Porsche	Trust (Japan)	Suzuka 14/4/91	No 12 dnf out of fuel
962C 167 Porsche	Nova (Japan)	Sports champs Fuji	Destroyed in accident May 1991
962C 168 Porsche	Alpha Racing	Jap Sports 10/3/1991 500km Fuji	8th overall
962C 169 Porsche	Dauer		Renumbered 962 LM GT 001. Was made into a road car
962C 170 Porsche	Trust (Japan)		Never raced in period
962C 171 Porsche	Nova (Japan)		No accurate details.
962C 172 Porsche	Dauer	Daytona 24 Hours 3/2/1991	Driven by the Andrettis
962C 173 Porsche	Dauer	Le Mans 1995	3rd Renumbered 962 LM GT 002
962C 174 Porsche	Strandell		Not raced in period
962C 175 Porsche	Dauer	Daytona 24 hrs 3/2/1991	No 0 dnf
962C 176 Porsche	Dauer	Le Mans winner 1995	Renumbered 962 LM GT 003
962C 177 Porsche	Brun Motorsport	Le Mans 13/6/1991	10th overall

Dave Klym told the author: “When we repaired many monocoques for Porsche and their customers, some of those repairs involved complete monocoques; we had to retain a small component from the original monocoque in order to retain the original chassis number.” The request for chassis and the contract with Porsche demonstrates the true capabilities of Dave Klym and Fabcar. In all, Dave Klym reckons that with repairs, etc, 27 chassis were eventually delivered to Porsche – the initial 19 in 1990, followed by a further eight over the years.

Fabcar was always at the cutting edge of experimentation, while at the same time delivering reliable equipment. When IMSA decided in 1995 to run a championship called the Exxon Supreme GTS, to replace the old GTU which was phased out in 1994, Dave Klym saw the opportunity in the regulations for something different, realising that the regulations allowed the engine and gearbox to be in the same overall area of the chassis of the prescribed production-shaped cars. But it did not specify exactly where the engine and gearbox had to go. Straight away his mind went to mid-engine, and the 911.

Hans-Joachim Stuck/Thierry Boutsen/Danny Sullivan 962-173: its monocoque was built by Fabcar, re-numbered as a 962 LMGT 002, and built at Weissach for the Dauer team that raced at Le Mans in 1994, this chassis coming in 3rd overall. (P)

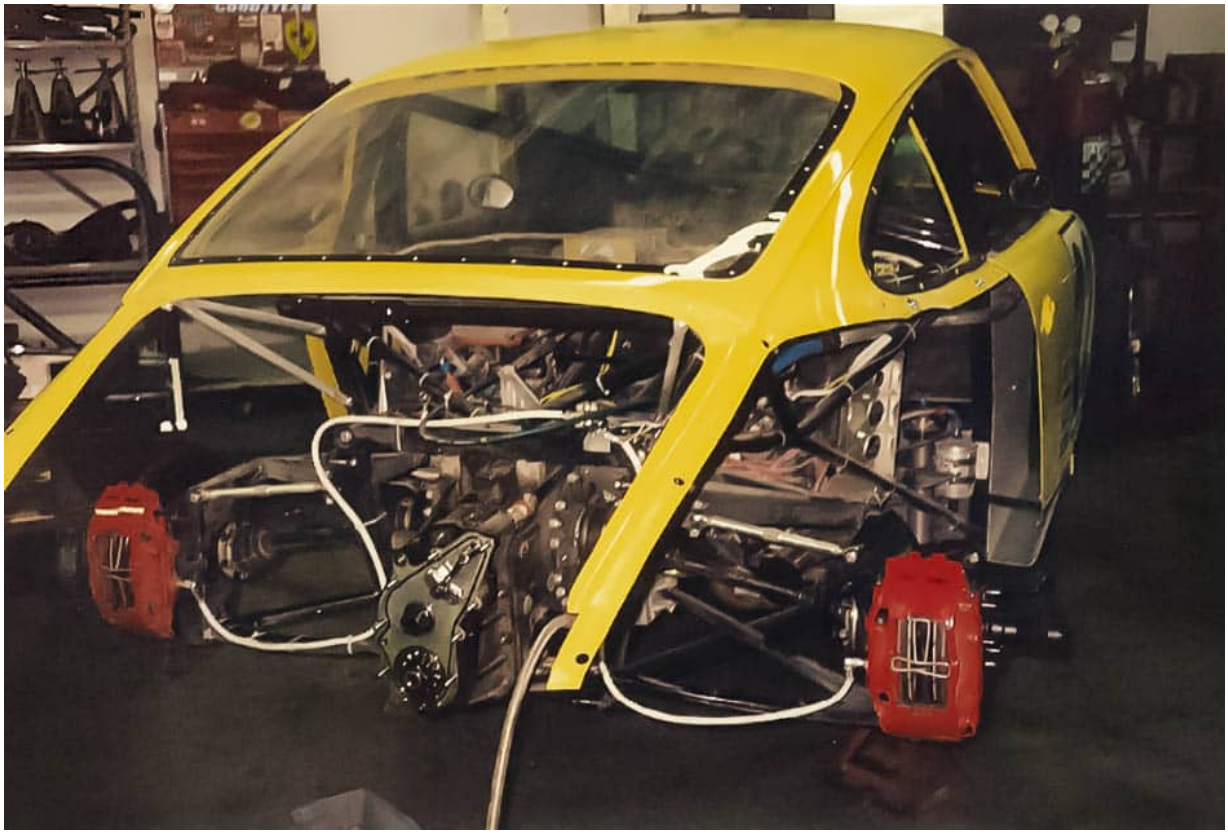


Here, the Fabcar Lights 701 of Charlie Monk and John Higgins is seen at the Mid-Ohio 3H of 1993 – still going strong; finishing 10th overall in IMSA GTP Lights. (MW)

Dave Klym says: “The idea was to create something that was light, and had not only good torsional rigidity, but fore and aft rigidity and driver crash protection as well. Essentially what I wanted was the shape of the C-2 Turbo. However, with the exception of the roof itself, the A-pillars and the rear quarter window area, which are standard steel Porsche parts, the rest was to be Kevlar and carbon fibre. In addition, the car itself would be quite a bit lower, with wider wheelarches to cover the BBS alloy rims, 11x17 at the front and 12x17 at the rear (Goodyears). Brakes were four-pot Brembo ventilated discs with 13.5-inch diameter rotors. The engine was Porsche 3.2-litre aspirated (turbos not allowed) fitted with an electronic Zytek fuel-injection/ignition system. The result was 330hp at 7500rpm through a Hewland DGB five-speed transaxle.

“We built two of these cars, in addition to the yellow one that was built for Marvin Epps, a Porsche Club racer from southern California. Marvin and John Paul Jr did the initial testing at our works in Indiana. A lot of people drove the car during testing at Daytona, including Paul

Newman and Hurley Haywood. Their feedback was very positive. The second one, for Tom Hessert from New Jersey, was campaigned by Alex Job Racing. This car was a monocoque chassis with a tube-frame rear end."

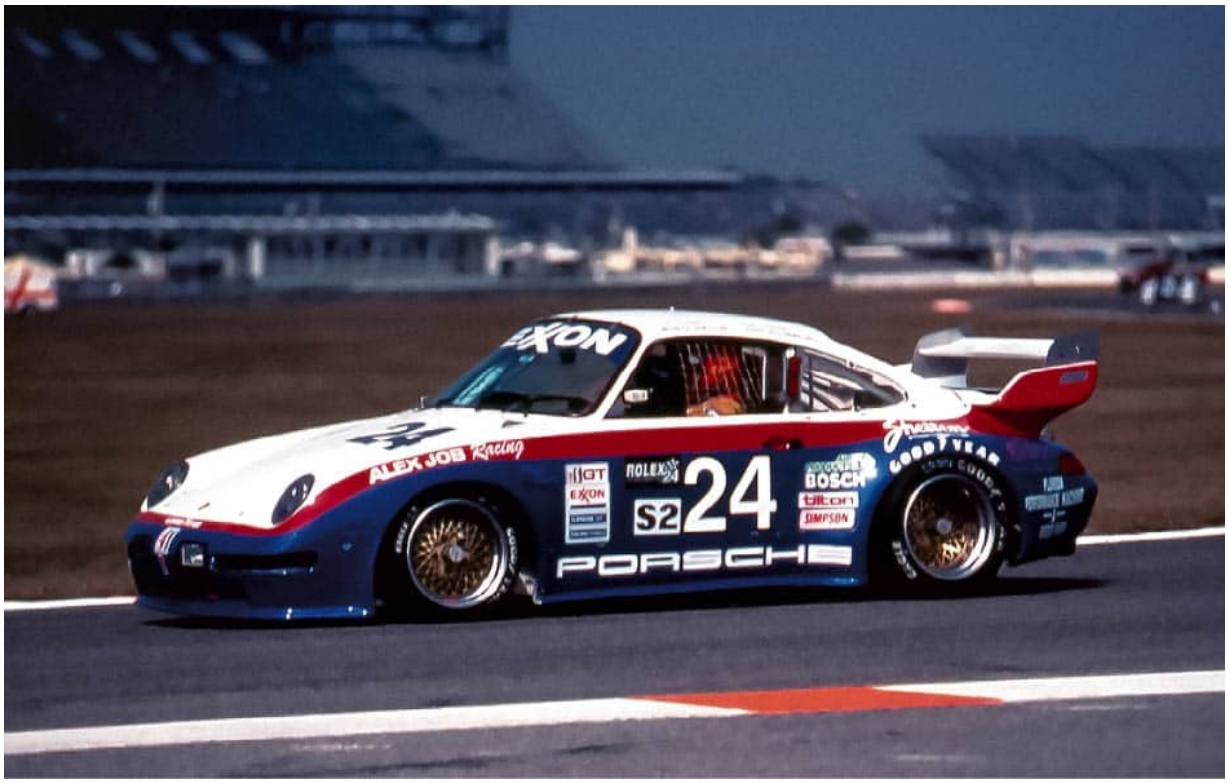


Lee Dykstra would design the chassis for the Dave Klym mid-engine 911. (DK)

Ready for the Daytona 24 Hours 1995: a Fabcar for the new GTS IMSA class. (JS)

The Marvin Epps-owned Fabcar mid-engine 911 started from 58 on the grid of 74 starters, but went out on lap 246 due to engine problems. Dave Klym: “It was a crank trigger issue during the race that put us out.” (JS)

Here we see the other Fabcar 911 – a mid-engine example (the 911 ME) entered by Alex Job Racing at Daytona, 23rd overall, 1996. (MS)



This is the Alex Job Fabcar-built monocoque/tube frame 911 running in the GTS2 IMSA class at Daytona 1996, 14th overall. (MS)

Sam Shalala's tube-frame Fabcar 911 rear engine with a 3.8-litre Lozano-Porsche engine at the Mid-Ohio 250 Miles. (MW)

This is a Fabcar tube-frame chassis Porsche 993 Carrera 2 #AJR911GT3, powered by a 3.8-litre Porsche turbo engine at the Daytona Finale 3H, 10 November 2002, run by the Canadian team GLDL and driven by Jacques and Hugo Guenette. (MS)

The Fabcar GTS2 was followed by the GTS3, again for Alex Job Racing; it put in some impressive performances. Fabcar also created a 911 for Dave Maraj Champion Race Team, and a 911 tube-frame car with a rear engine for Sam Shalala in 1997. Dave Klym told the author: “We also turned one of the 944s that we built for Porsche North America into a 968 for Joe Cogbill. He provided the bodywork, engine and some suspension components. The suspension components were uprights from a March Indy car. I designed the rest of the suspension around the uprights.”

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Obermaier-Porsche

Hans Obermaier Racing originally began in 1983 with a factory 956-109, continuing into the 962 era with factory chassis 962-130 – a sheet aluminium chassis. Through 1989, Jürgen Lässig and Pierre

Yver were the most frequent drivers. The Obermaier team earns its place in our work, though, because from the winter of 1989 it was to use a non-Porsche chassis. Over the winter of 1989-90, a switch of chassis was made to a honeycomb Thompson chassis 962-901, with a Fabcar-supplied chassis 962-155 also appearing on the scene on 8 April 1990 at Suzuka, for the opening round of that year's World Sports Car Championship. However, the No 26 car, chassis 901, of Lässig/Grohs/Opperman, lasted only 39 laps before going out with electrical problems, and the No 27 car, chassis 155, was disqualified at the end of practice for being underweight! A third Thompson chassis 962-902 would appear at Silverstone on 20 May.

The Fabcar chassis 962-155 would run at the 480km Monza, and at the Silverstone round on 20 May, where an accident in practice put paid to any more running for the rest of 1990.

The third new Thompson chassis to appear in the Obermaier team in 1990: the 962-902 at Silverstone 1990 for the Shell BRDC trophy round of the World Sports Car Championship. Jürgen Opperman/Harald Gros took the car to 10th overall from 14th on the grid. (P)

Nürburgring short 2.82-mile circuit, 18 August 1991; practice for the 165-chassised 962 resulted in a 10th place grid position and 4th overall. (P)

On its way to 4th overall: Jürgen Opperman/Otto Altenbach in the 962-165 at the Nürburgring, 1991. (P)

Opperman/Altenbach/Kessel: 9th on the grid at the 1993 Le Mans 24 Hours, finishing 7th overall. (P)

The 962-901 Thompson chassis raced throughout 1990 in World Sports Prototypes and the Interserie Challenge, taking in several rounds of the World Championships, and three rounds of the Interserie, its best performance being at the Hungaroring on 4 May where Harald Gros drove to 4th overall, having finished 2nd in heat 1, and 8th in heat 2 of the Interserie round. The 962-902 ran at six rounds of that year's World Championships, its best result being at the non-championship Le Mans 24 Hours and the Championship Mexico 480km, in both cases finishing 9th overall. The 902 chassis was not seen again in 1990 or 1991. For 1991 the 962-155, suitably updated, raced at only the two Interserie rounds at Brands Hatch carrying No 5, where Otto Altenbach took the car to 5th overall – 6th in heat 1 and 6th in heat 2; then at Most in Czechoslovakia on 11 August, where again Altenbach finished 5th overall. A week later, the 962-155 was at the Nürburgring on the 2.82-mile circuit; carrying No 59, the Obermaier/Salamin entry qualified 10th, working its way up to 4th overall in the hands of Jürgen Opperman/Otto Altenbach. At least, that's what the records, as well as *Time and Two Seats* by János Wimpffen, suggest. However, Obermaier is also said to have had the 962-165 chassis, a Stickel Germany tub, in the car supplied by Porsche. It is shown racing just once at the Nürburgring 1991, again sponsored by Primagaz.

The car was then parked up until it reappeared in 1993. More in a moment. For the Obermaier 962 C 901 chassis, 1991 would see the car race at only the Interserie at Zeltweg on 26 May, where Jürgen Opperman took it to 6th overall after the two heats. At the Le Mans 24 Hours it was all over on lap 232, when suspension failure intervened for the Jürgen Lässig/Jürgen Opperman/Pierre Yver car No 51. It came out again at the World Championship round at Magny-Cours on 15 September, where it was 10th overall with Altenbach/Lässig at the wheel. That car, too, was then parked up until the 1992 Le Mans 24 Hours, where the 1991 driving team avenged its mishap from the year before by finishing 10th overall from 16th on the grid. Hans Obermaier brought the 962-155 out just once more, at the 1993 24 Hours Le Mans, running with No 21; the Opperman/Altenbach duo were joined by Loris Kessel to qualify the

car 9th on the grid, and then translated it to a fine 7th overall.

Le Mans 1993 was the last time the racing team from Bavaria would be seen in the 962s, as time and technology took their toll and the GT series proved more attractive to Mr Obermaier.

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Kremer-Porsche – Part 2

From the beginning of the 962C years, the Kremer team had, as always, optimised its own ideas into the new cars. The first Kremer 962 chassis came from Thompson in England as composite chassis tubs of aluminium honeycomb, built to a 962 specification with several Kremer ideas incorporated. In terms of engines, many modifications were made by the skilled Kremer engineering team. Kremer was not frightened to push boost pressures to the limit on the latest turbo cars. In the 1980s and on into the 1990s, Kremer created a number of cars utilising TC Prototype (Thompson) chassis tubs. There would be many – so many that it is difficult to be precise, so this listing is not definitive. For instance, there were at least five cars that ran with chassis number 962-118, says John Starkey in his work *Golden Era*. A look at the records show the following Kremer models: CK6, CK6/87, CK6/10, CK6/01, CK6/01(2), CK6 89-3, CK6-89-4, CK6-06, CK6/04-2, CK5/05-2 (carbon chassis), CK6/06-2, CK6/07-2, CK6-08, CK6-08-1, CK6-08-3, CK6/09, CK7, CK7-02. One might well say phew! One thing we do know is the CK6-04 performed very well in the Interserie in 1990, taking the Championship with Bernd Schneider at the wheel. When the opening round of the European season for the World Sports Prototype Championship was held at Monza, Kremer was there with the CK6-2; the No 10 car would finish 9th overall.

The Kremer workshop in the 1990s; established at the Robert-Perthel-Straße 31 in 1974 and left in 2004 – "After 30 years of motorsport excellence," says Achim Stroth! (JS)

A pair of 962 Kremer CK6s at the Monza 480km on 29 April 1990, both Thompson-chassised cars, the No 10 being the Kremer Sarel van der Merwe/Bernd Schneider example, and the No 26 the Walter Brun-entered car of Harald Gros/Jürgen Opperman example. (P)

Erwin Kremer had also partnered with Bo Strandell to run the Kremer-Convector entered 962-CK6-02 for Anders Olofsson/Anthony Reid, No 11; they were to finish 10th. At Silverstone on 20 May, round 3 of the World Sports Prototype Championship, the No 10 car ran again with the same driver line-up as at Monza, finishing 5th overall.

Although Kremer was then using aluminium monocoque tubs, it was, along with others, already looking at carbon fibre composite chassis, and it was not long before John Thompson's TC Prototypes Company in Wellingborough, England, were working on producing a carbon chassis. He was to make two for Kremer; the first one, confusingly, would be called a CK6, the same as the aluminium chassis. As Achim Stroth told the author, on the 1990 CK6 (aluminium

chassis) Kremer brought out a short-tail version that it called the ‘Body’ version, where the rear wing was no longer attached to the bodywork but to the gearbox. This modification was carried forward into the carbon CK6.

The Le Mans 24 Hours of 16-17 June 1990 saw a colourful 962-CK6-06-2, for Philippe Alliot/Bernard de Dryver/Patrick Gonin; they finished 16th overall from 19th on the grid. These two cars, the aluminium CK6 and the carbon version, would run in the WSPC Championship for the rest of the year. 1991 would see the arrival of the carbon chassis 962-CK6 numbered 05.

From the spectator’s point of view, it would have been tricky to tell the difference between a CK6 carbon-chassised car in 1991, and aluminium versions, unless you knew the chassis numbers. Wimpffen, in *Time and Two Seats*, identifies the CK6s in 1991 as Kremer 05 at Silverstone (carbon), and Kremer chassis 03 at Le Mans (aluminium). The Reuter/Toivonen/Jarvilehto car 11 finished 9th. The CK6 car 46 (Needell/Lopez Rocha/Foitek) dnf’d, that being a Thompson chassis (aluminium) (09). To be sure exactly which was which in this period is fraught with difficulty.

Kremer CK6-06-2, a Thompson aluminium chassis tub 962, at Le Mans 1990; Philippe Alliot/Bernard de Dryver/Patrick Gonin, 16th overall from 19th on the grid. (P)

At Le Mans in 1992, due to the new regulations, and Porsche not having a 3.5-litre engine and disagreeing with the governing body's opinions, the company (in the form of Porsche Weissach boss Max Welti) suggested that its clients should not take part, and should boycott the race. Kremer, however, had a contract with Kenwood and needed to fulfil its agreement, so they turned out, and not with just the one car but with three CKs. CK6-08 was the carbon tub, Kenwood-liveried car No 51, which finished 7th overall. No 52 was CK6-09, an aluminium honeycomb (Thompson)-tub car with Donovan/Rickett/Coppelli on board; they completed the race 11th overall. The third Kremer car was a spare No 51 car identified with a white windscreen sticker. This car practised, but did not race. It was the T car CK6-05-2; interestingly, it was 8th fastest.

The Kremers entered the CK6 (closed cars) 962s again, in 1993 at Le Mans, where Jürgen Lässig/Giovanni Lavaggi/Wayne Taylor took 12th place in the No 10 car chassis 08, with 13th place being taken by the sister car No 11 (chassis CK6-09) of Andy Evans/Tomás

Saldaña/François Migault. 1993 would be the last year of the super Sports Prototypes of Group C1, their demise brought about by changes in the regulations. The 962 CK6 of 1992 was to be superseded by the K7 Spyder. Manuel Reuter would again be No 1 driver. The K7s were converted from the CK6 aluminium-chassised cars. These cars for the Interserie series of races looked very spectacular.

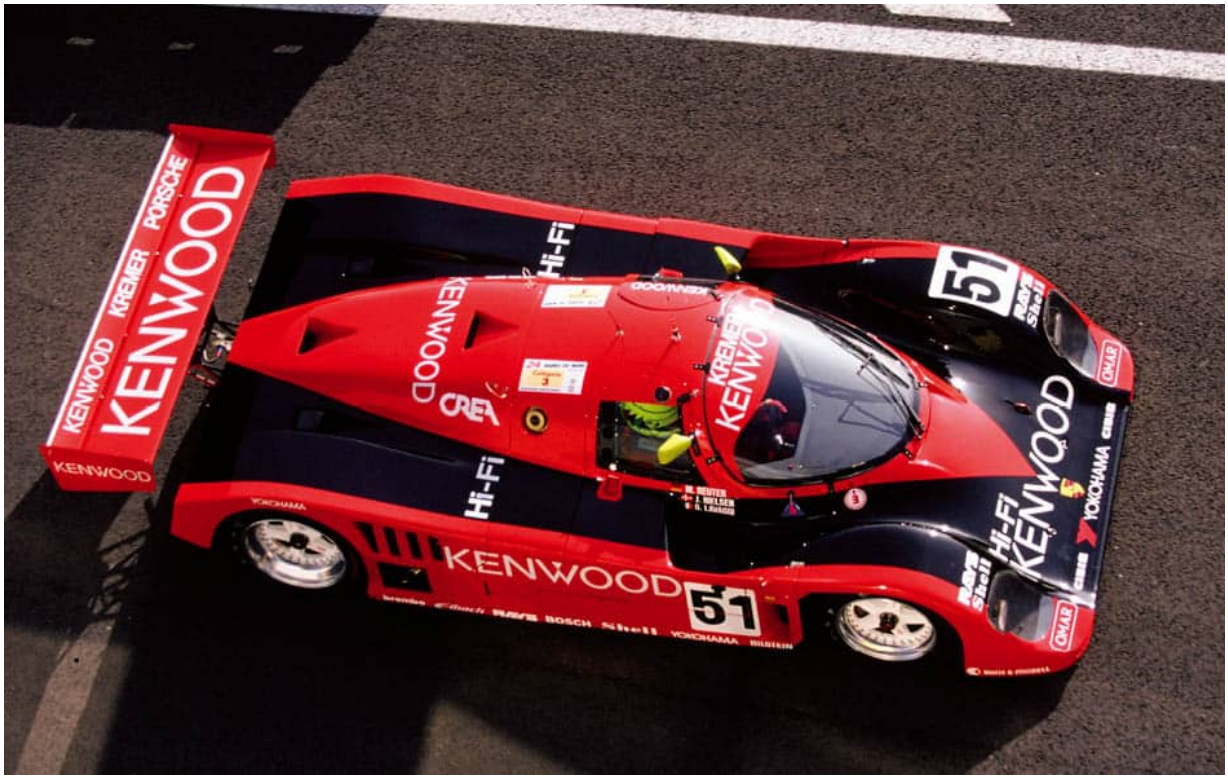
1991 Manuel Reuter/Harri Toivonen in the Kremer carbon chassis finished 5th overall at Monza. This chassis was later converted into a K8-03. Note the rear-wing mounting arrangement on the gearbox. (P)

1991 Magny Cours 15 September: CK6-08-3 Manuel Reuter/Harri Toivonen, 6th overall, 1st in category 2 from 11th on grid. (P)

Not only good looking, but very fast, the Kremer K7 Spyders – all based on existing monocoques – cleaned up the Interserie Challenge at Jarama, Mugello, Most and Siegerland; it was only on the last two races that the K7 was beaten (2nd at Donington, 7th at Zeltweg). Come 1994, a new organisation, entitled the BPR series (Barth, Patrick, Ratel), set about creating a Global Endurance Championship, after the frustrations of the changes made in the previous years created by the FIA. It was designed to be a renaissance of the great days of racing in the World Endurance GT Championship; 1994 would be its first year of operation. Little by little, the series GT cars attracted more and more interest. Kremer switched to the Honda NSXs, with monocoques made once more by John Thompson.

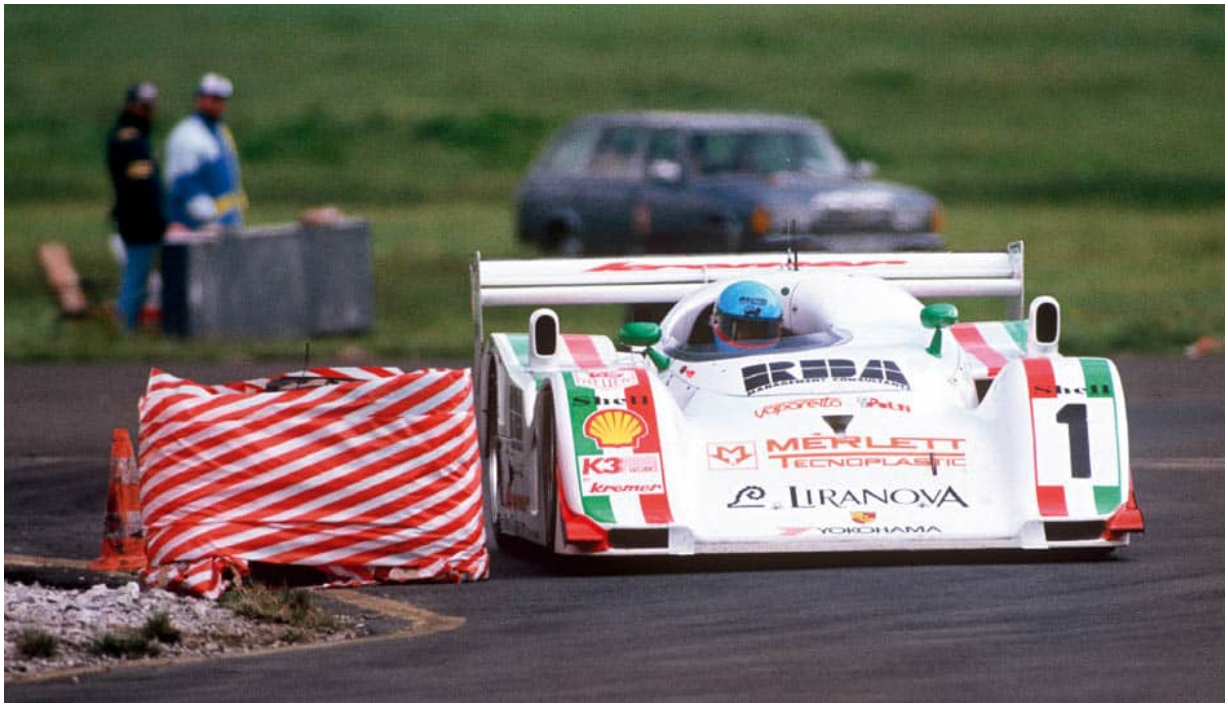
One team, however, did find an extra life for the 962 – that would be Dauer. We shall see more of this unique experiment in a moment in the Dauer section. For now, concentrating on Kremer, we move on to the 1994 Le Mans 24 Hours. Kremer produced what was to be called a WSC (World Sports Car – reflecting a new title introduced by the FIA) in Gulf colours – not really a K8 as many think. As Achim Stroth told the author: “This car anticipated new regulations relating to aerodynamics, coming in 1995, created as a WSC car. It featured

the footwell area straight off the 962." For 1995 the chassis would need more modifications, and again in 1996 when further rule changes came in.



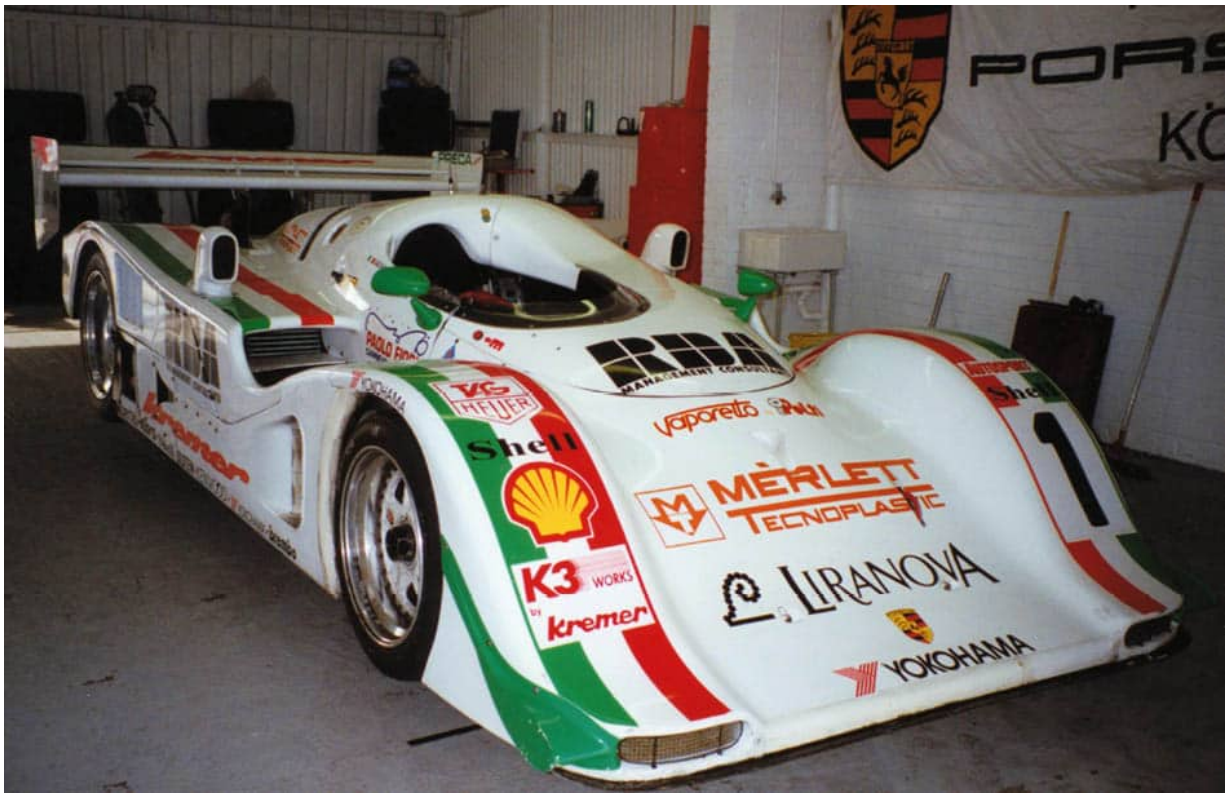
At the 1992 Le Mans 24 Hours we see the carbon (Thompson chassis) CK6-08 Kremer driven by Manuel Reuter/John Nielson/Giovanni Lavaggi finish 7th overall and 2nd in class 1. Kremer had two more cars at the 1992 Le Mans. (P)

For the 1992 Interserie challenge, Kremer created the K7 from the Thompson-created 962 aluminium honeycomb-chassised CK6 car used in 1991, seen here at Brands Hatch. (JS)



A second K7 (aluminium tub) was the Giovanni Lavaggi-driven car, seen here, that took victory in both heats at the Interserie round 3 at the Most Autodrome in Czechoslovakia on 8 August 1993. (P)

Siegerland Interserie 1993, round 4, 5 September: the K7 of Giovanni Lavaggi 3rd overall; the winner was the sister car of Tomás Saldaña. (P)



The Thompson chassis CK7 of Giovanni Lavaggi, pole position, winner of heat 1 but 3rd in heat 2, giving a 2nd overall in the Interserie Coupe Donington, 26 September 1993. (JS)

The WSC (World Sports Cars) version created by Kremer (aluminium tub) which they entered at Le Mans 1994. Bell/Lässig/Donovan finished a fine 6th overall. As Achim Stroth told the author: "This car anticipated new regulations relating to aerodynamics, coming in 1995. It featured the footwell area straight off the 962 and given the chassis spec by Kremer of 07SP." (PK)

Thompson chassis K8-07SP: the Cor Euser/Antonio Herrmann/Tiff Needell/Franz Konrad car, entered by Franz Konrad Motorsport, qualified 23rd and looked like going to the end, but dnf'd on lap 436 due to an accident. (JS)

The chassis plate of the 00 car at Daytona 1995. (JS)

At the 1994 Le Mans 24 Hours, running in the LM prototype GC 90 class, Derek Bell shared the WSC chassis 07SP car with Jürgen Lässig, and Robin Donovan, coming home 6th overall behind the 'trick' Dauer 962s, two Toyotas, and a Nissan. As Achim Stroth told the author, Kremer entered the 1995 Daytona 24 Hours on 4-5 February, with the K8-01 aluminium honeycomb chassis. It won!

In Europe the Kremer brothers ran a Porsche 911 GT2 in the Global Endurance Series (BPR). For the Le Mans 24 Hours in June, the ACO was once more re-assessing its rules, and things were in a state of flux as it deliberated. The WSC class would run at this race, and Kremer entered two cars.

BPRs Global Endurance series and European Championships had livened up a flagging period of sports car racing with new classes, and by the end of 1995, a year packed with a variety of races, they had been deemed a success. For 1996 the World Sports Car Championship would, as in 1995, be mostly centred around the IMSA WSC series and Le Mans, while the BPR Global Endurance spread

its wings further.

The K8-01 1995 Thompson chassis, seen here at the Daytona 24 Hours 1995. Driven by Giovanni Lavaggi/Jürgen Lässig/Marko Werner/Christophe Bouchut, it would end the weekend as overall winner. This K8-01 WSC-01 would also run at Le Mans in 1995, but failed to finish following electrical problems, going out on lap 163 at 08.26h on the Sunday. Lässig/Konrad/Herrmann had qualified the No 3 car 16th on the grid. (MS)

1995 Le Mans: No 4 Kremer WSC-02 (carbon tub) car of Thierry Boutsen/Hans Stuck/Christophe Bouchut, 6th overall, 2nd in the WSC class. (AJFR)

1996 Kremer K8-03 in the Sports Prototype class at that year's Le Mans 24 Hours: Jürgen Lässig/Christophe Bouchut/Harry Toivonen had a torrid running in Class LM Prototype 1. They started well enough from 13th on the grid, but after only a few laps Lässig stopped at Tertre Rouge Esses at 17.41h on the Saturday and restarted. Twenty minutes later they needed gearbox repairs, followed by a bonnet change at 21.32h, then Lässig made contact with the wall at the Porsche Corner just before midnight; this led to abandonment. (P)

1996 The Kremer K8-02 carbon chassis created originally by Thompson as a CK6. At Le Mans the drivers were Steve Fossett/George Fouche/Stanley Dickens; running in the new class, Le Mans Prototype 1, they were to abandon at 19-22h on the Saturday following an accident. (AJFR)

Kremer had become a big name in customer car tuning, and the WSC side of things was to be centred around competing at Le Mans for 1996. Porsche and Joest had entered the scene with a Porsche WSC contender, which would eventually prove to be a race winner once in Joest hands; we will shortly see more in this chapter. Kremer had a poor weekend that 15-16 June on the La Sarthe circuit, involving, unusually for the Kremers, accidents and engine problems.

The competition was moving on, and in fact times were changing massively once more. Whereas Sports Prototypes still remained a favourite amongst the fans, in several ways the classes in this type of racing were floundering. It was the global World series, which favoured GTs, that was currently the mainstay in the closed wheel racing world, over the sports prototypes and GTs.

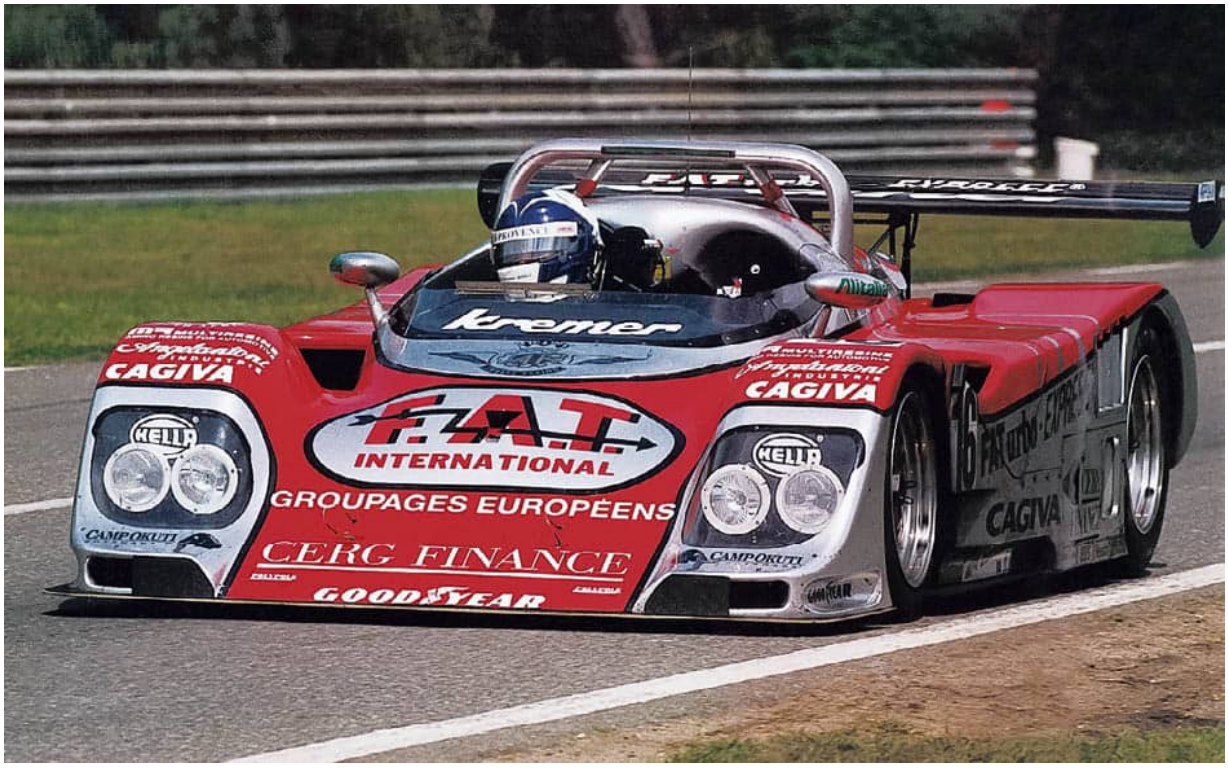
The Kremer open WSC cars of the period were:

Kremer K8	Thompson 01	Seen at Le Mans 1995 – the Daytona winning car
Kremer K8	Thompson 02	Seen at Le Mans 1995 – carbon construction
Kremer K8	Thompson 03	Seen at Le Mans 1996 carbon CK6 (this was the Manuel Reuter Coupé 1990) Later converted again back into a coupé
Kremer K8	Thompson 07SP	Seen at Le Mans 1994 – this is the Gulf-liveried car

From the 962 CK-6 closed cars, a number of developments had taken place, as we have seen above. Inevitably, progress marches on, and the frequent rule changes during the 1990s were not helping development of the Sports Prototypes. The BPR global series, and the growing strength of IMSA and the Sports racing series in the USA, added to the demands on Kremer's services for customer tuning. It all added up to the time when the Kremer brothers decided to move away from the Sports Prototype cars. Manuel Reuter had won the Interserie driver's title in 1993 with the Kremer Spyder. As we have seen, this had been followed by the conversion of another CK6 to the K7 Spyder for the Interserie, for Tomás Saldaña/Giovanni Lavaggi, while Kremer in 1994 ran mainly the Honda NSX in the ADAC GT Cup. Le Mans saw the K8 Spyder as a mainstay. There was talk of a CK9 Kremer, but as Achim Stroth told the author: "We did the body draft of the front end but not the rear. It could not be decided which engine to use, and at that time Porsche did not want to supply Kremer with the new GT1 engine. It would have had a carbon chassis (it is still at Kremer) made by Thompson. In the end the project was stillborn."

Kremer moved on in its business and other racing classes, turning to Lola with Roush engines.

Jürgen Lässig/Carl Rosenblad/Tomás Saldaña at Le Mans practice 1997: the K8 listed as WSC chassis 02. It qualified 15th overall, but went out on lap 103 at 23.24h due to a blown engine. (P)



Le Mans, 7 June 1998: the No 16 Kremer K8-WSC-03 of Almo Coppelli/Rocky Agusta/Xavier Pompidou, 12th overall. (P)

Le Mans 1998: a better run than in 1997 for the Kremer car, here during a night stop. (P)

Ploeg/Papenburg in the Kremer K8 at Spa Francorchamps for the Sports World Cup race, 16 May 1999. An 11th place on the grid was to end in a dnf due to an accident. (PK)

♦ ♦ ♦ ♦ ♦

Schuppan-Porsche

Vern Schuppan, born on 19 March 1943 in Booleroo Centre, South Australia, became a racing driver in the early 1970s. His contribution to motorsport is frequently underestimated, but in fact is enormous, even today. His passion was single-seaters; starting in Karts, as many do, he was a prolific winner. Vern Schuppan told the author: “I was not long married when I decided that the place to go proper motor racing was England. I agreed with Jennifer, my wife, that we would give it a couple of years; if it didn’t work out we would have had a great adventure, and then do what she wanted us to do. When I won the Formula Atlantic Championship in 1971, BRM gave me an

F1 test drive. This was followed by a race at the prestigious non-championship Gold Cup for F1 cars at Oulton Park. I qualified 5th and finished 5th. This, my first F1 race, was a great start to my aspirations of a Formula 1 career. Just one week later, BRM sent me off to drive in the Belgium GP. Unfortunately, during practice, BRM team driver Peter Gethin damaged his car; he was moved into Austrian driver Helmut Marco's car, who then took over my car! My Oulton Park F1 success, however, continued with a 4th place finish in the F1 John Player Victory Race at Brands Hatch, and a BRM F1 contract to drive alongside Clay Regazzoni for the 1973 GP season. Shortly after Christmas, a major setback followed when Niki Lauda managed to make a deal with BRM boss Louis Stanley, to buy my drive for a reputed £50,000. Although I remained under contract to BRM as a reserve and test driver, I did just two races, the first at Brands Hatch in the Race of Champions, where I qualified 3rd alongside Lauda, and the *Daily Express* Trophy race, with an ill-handling car at Silverstone."

Schuppan's name was now out there for the teams to see; he became a successful performer in almost any type of car, competing three times at the Indianapolis 500, winning 'Rookie of the Year' in 1976, and finishing 3rd overall in 1981. He had already won the Singapore Grand Prix in 1973, placed 2nd in the Spa 1000km World Endurance round in the Gulf Mirage with co-driver Howden Ganley, and won the Macau Grand Prix twice (1974 and 1976). He came 3rd in the 1975 Le Mans 24 Hours with Jean-Pierre Jaussaud in a Gulf Mirage; 2nd at Le Mans in 1977 with Jean-Pierre Jarier; and 2nd in 1982 in a Rothmans Porsche 956 with Jochen Mass. Then in 1983 he won outright with Al Holbert/Hurley Haywood for Porsche in a Rothmans Porsche 956. He also went on to win five races and the 1983 Japanese Sports-Prototype Championship, and won in F5000 for Sid Taylor and Teddy Yip in Europe. In the USA he drove for Dan Gurney, with a 2nd place in the F5000 Long Beach GP. In Australia he won the F5000 Rothmans Series. He continued to race at the highest level in sports prototypes, usually with Porsche, through to 1990.

In 1987 he formed Vern Schuppan Racing to contest the 1988/89

Japanese Sports Car Championship. Via an arrangement with Porsche, the Porsche factory prepared one of its works cars – 962-008 – to run it in Team Schuppan Omron livery in the World Sports Prototype Championship 1000km round at Fuji. The arrangement with Porsche included the sale of 962-008 to Team Schuppan, which the team ran successfully for Omron in the 1989 All Japan Endurance Championship.

Vern Schuppan: “In 1983 I was hired to do the all-Japan Sports Car series – a very important series, fully televised and with large spectator attendances, at times totalling 80,000 at Fuji. I had won the Championship in 1983 with Nova Engineering, and continued driving for Team Nova and later Team Trust until 1989.

“In 1987, whilst driving the Team Trust Porsche 956 in the all-Japan Sports Car Championship, I was offered the opportunity of preparing and entering a Porsche 962 at the 1988 Le Mans 24 Hours for the Japanese financial services company Takefuji. At around the same time, Rothmans Marubeni in Japan approached me about their keenness to have a Rothmans car running in the 1988 All-Japan Sports Car Championship. Somewhat fortuitously, I owned the 1986 Le Mans winning 962-003. Although it was in a damaged state following a crash in the hands of Hans Stuck at Hockenheim, my mechanic Michael Negline was already in the process of rebuilding the car. It was this car that I proposed to prepare and run for Rothmans Marubeni. I set up Vern Schuppan Ltd, based initially at Richard Clear’s race shop in the village of Burnham, (in the UK) before moving to larger premises nearby, Howden Ganley’s former Tiga Race Cars factory in High Wycombe.”

As Vern continued driving for Trust (essentially competing against his own team), he hired GM prototype engineer and race savvy Ray Borrett. Although he was then based in Melbourne, Australia, Schuppan flew Borrett to Japan for each race to manage the Team Schuppan cars. When Schuppan was also approached about running a car in the 1988 All-Japan Sports Car Championship for Omron again, he acquired a car from US team owner Chris Kneifel, of the disbanded Primus team. Kneifel owned chassis 962-123, which had been supplied via Porsche AG to Porsche Cars North America, and

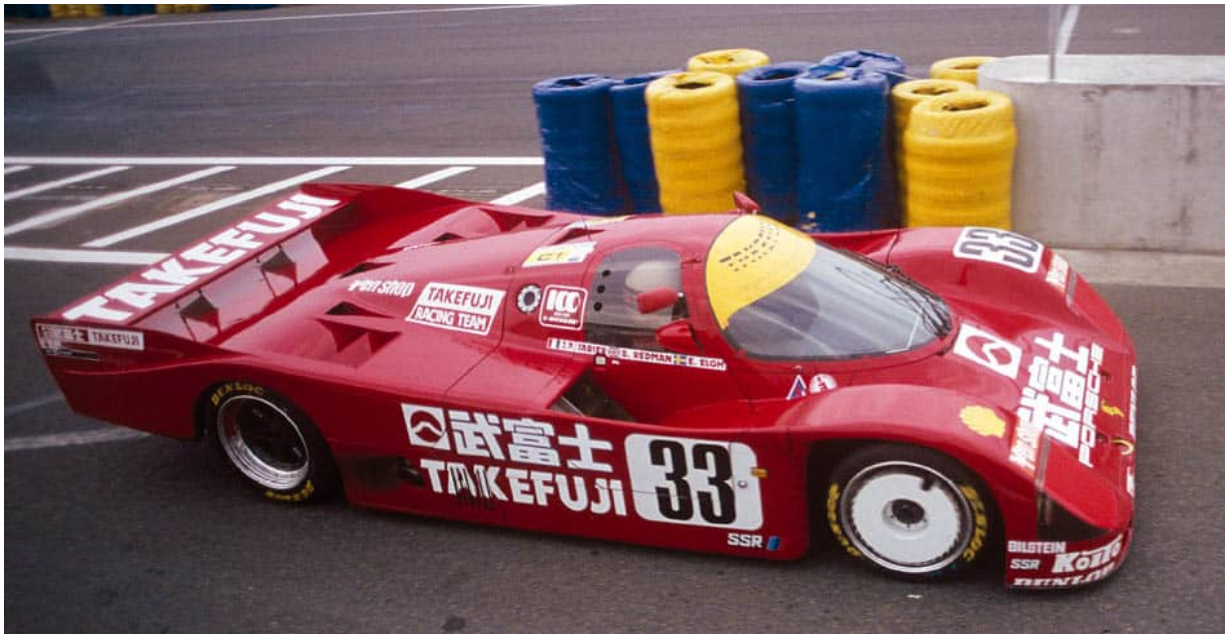
was raced in the USA by Primus Motorsport from March to May 1987.

On 29 November 1987, in the Fuji 500, the Team Schuppan Rothmans car, driven by Geoff Brabham and Eje Elgh, finished 2nd. Vern: “Bizarrely, and most generously, Trust had agreed for me to continue as their driver, even though I was pitched against my own team – something I can only ponder could happen in Japan.”

On 3 March 1988, the All-Japan Sports Prototype Endurance Championship (JSPC) kicked off with its first race, the Fuji 500. Team Schuppan entered two cars, the former factory works Rothmans Porsche 962-003 for Elgh/Sala, and the Omron Porsche 962-123 for Price Cobb/Kenny Acheson; the Rothmans car finished 4th and the Omron car 5th. The Fuji race was followed on 10 April by the Suzuka 500, where Rothmans Team Schuppan had its first win, beating Team Schuppan owner, Vern, into 2nd place driving the Trust 962 with co-driver George Fouche. Next, on 1 May at the Fuji 500km, the Sala/Elgh Rothmans car finished 5th, followed by another 2nd on the 24th of July for the Acheson/Cobb 962-123 Omron car in the Fuji 500. The results of the 1988 Fuji 1000 WEC, on 9 October, show a 7th place overall for Eje Elgh/Maurizio Sandro Sala in Rothmans 962-123.

Vern: “New tubs from Porsche during this period were not available, so we set about building a Le Mans car for Takefuji, by acquiring a chassis from John Thompson in the UK. The Thompson tubs featured honeycomb aluminium floors and these were an excellent alternative to the factory-supplied tubs. In those days (and for many years previously), cars and engines were transported between countries on customs carnet papers, and it was common practice amongst teams to swap chassis plates and engine numbers to match existing carnets, which in later years caused great debate amongst historians as to which was the chassis number and race history of a particular car. In-house, we referred to the Thompson car as VSR 01; the Takefuji car chassis plate at Le Mans in 1988 bore the number 123.” Michael Negline oversaw the construction of the car. The reader should not confuse the 962-123 (the former Primus IMSA car) that was racing in Japan in the period with this one-off Le

Mans car. “They were not the same car,” says Vern Schuppan. (Author’s note: the reports, including those of Le Mans, say that this car was the former IMSA 123 converted to Group C over the winter of 1987/88. Not so.)



The No 33 car, numbered chassis 962-123 (Thompson chassis tub, built up by Michael Negline), for the 1988 Le Mans. The Schuppan-entered car in Takefuji livery with Brian Redman/Jean-Pierre Jarier/Eje Elgh: 14th on the grid, 10th overall finish. (P)

The first development Schuppan road car created from the former 1988 962-123 Le Mans car. (JS)

For Le Mans in 1988, Vern Schuppan says: “Brian Redman/Jean-Pierre Jarier/Eje Elgh drove our beautifully prepared Takefuji car – competitively for most of the race; it was unfortunately hampered by two broken exhaust systems, each requiring lengthy pit stops.

“This resulted in dropping to 10th overall at the finish. After the race I apologised to Brian for the failure of what had looked to be, potentially, a pretty decent result. I was astonished when Brian told me not to worry – that from his nine starts at Le Mans, this was his best and only finish! Brian – without doubt one of the best drivers in the world – such is the lottery of Le Mans! At that Le Mans 1988 race I was driving the No 18 factory Shell Dunlop Porsche 962 with Bob Wollek/Sarel van der Merwe, with a two-lap lead early Sunday morning; unfortunately racing stopped for us when a water pump failed. Beaten by my own team – they were 10th!”

Following Le Mans, the Thomson chassis car would play a key role in the development of a road car project by VSL (Vern Schuppan Limited), and was converted to be used as a test ‘mule.’ Vern

Schuppan had a series of road cars under consideration.

During 1988/89, Vern's team of people expanded to include, amongst others, former international driver and race car manufacturer Howden Ganley (Tiga Race Cars, BRM, Williams, F5000 McLaren), F1 designer Ralph Bellamy (McLaren, Lotus, March, Leyton House), race and road car development engineer Martin Read (Williams, Tiga, Hesketh, Bob Sparshott Fabrications and IAD) and Marketing Consultant Jackie de Havas.

The road car undergoing tests on the MIRA (Motor Industry Research Association) test track, seen here at speed on the banking. (VS)

To head up the street-legal Le Mans Porsche 962 road car project, Vern hired Ray Borrett again, whose expertise as a prototype engineer and negotiator of GM engine projects and component manufacturing was a perfect choice for the job. Ray resigned from GM and, along with his family, moved to the UK.

All was going well until one day in late spring, when Howden Ganley was driving back to the VSL works from the MIRA (Motor Industry Research Association) test facility in the UK, in the former Le Mans car. The car had been undergoing emission testing; fuel

regulator failure caused it to catch fire, resulting in closure of the motorway, and a completely destroyed project prototype car.

In Japan 1988, the Vern Schuppan team continued to run the 962-123 former factory chassis, ex-Primus Racing 962 in Omron colours. In England, Vern Schuppan Ltd progressed. The intention was to offer a carbon chassis and a limited range of components, including improved performance Schuppan turbochargers to other teams.

After six years of a fruitful and happy relationship driving for Trust, in 1989 Vern left the team to concentrate on running VSL and Team Schuppan. The 962-008 Omron-liveried car would run in 1989 in the Japanese Championship, winning the Fuji 1000km on 30 April. Vern Schuppan himself drove with Eje Elgh/Keiji Matsumoto. At Le Mans on 11 June 1989, the Team Schuppan Omron-liveried No 55, with Vern and Eje driving with Gary Brabham, was to finish 13th overall from P18 on the grid. However, the Schuppan team took a hit when the Jean Alesi/Will Hoy/Dominic Dobson Porsche factory-delivered 961-143 went up in flames, after a fuel fitting failed on lap 69. It had been the first customer 1.7 (electronic upgrade) car. It went back to the factory for an expensive rebuild.

Vern Schuppan: “In 1988 I had been approached by one of the principals of Kosho, a branch of the huge Nomura Corporation. Kosho specialised in the golf course and hotel construction business, and wanted to know if it was possible to build a street-legal 962 Le Mans car, the idea being that they would sell a car to each golf course/hotel owner. The cars, of course, would be small potatoes when compared with the cost of a golf course and hotel! Of course, this was interesting. It coincided with my thinking about a carbon composite chassis tub. Porsche had stopped making 962s; replicas had started to appear, and collectors were starting to buy 962s. I had the idea that a race team could buy one of our carbon tubs, which were built to take all of the original 962 running gear, suspension parts and so on, and transfer the components from their original Porsche to the carbon chassis. In our view, the carbon chassis would be safer, and retain its rigidity over a longer period than an aluminium tub. At the end of the car’s racing life, the components would be transferred back to their unmolested and original Porsche chassis. Initially I made

the decision to develop a carbon composite chassis for our race team. The task was given to the UK aerospace composite specialists, Advanced Composite Technology (ACT). In discussing this with Norbert Singer, he expressed interest, assisting enormously by providing ACT with a full set of 962 tub blueprints. The idea was also that privateers whose cars may have been involved in an accident could replace their damaged tub with our new carbon tub. We also believed the tubs would, potentially, be stronger, and thus safer, in the event of an accident. Secondly they should be stiffer than the ally tubs, and therefore provide better handling. We built the first couple, and one was sent to Porsche for evaluation and torsion testing. Surprisingly, it was found to be of similar rigidity to that of the aluminium tub. Like many 962 component copies, few surpassed the performance of Mr Singer's original designs." In all, seven carbon chassis were manufactured by ACT, from which Vern Schuppan Ltd produced five race cars.

962-143 in the hands of Will Hoy/Jean Alesi/Dominic Dobson. Following a fuel fitting failure, the Takefuji 962 suffered a spectacular fire on lap 69. Dobson, realising he was on fire, braked – only to discover he in fact had no brakes, and had no alternative other than to run the car along the Armco to get it stopped, just past the signalling point on the Mulsanne. The fire was extinguished and the car returned to the paddock on the breakdown truck. (P)

Spa 1989: Vern at the wheel of the new carbon-chassised Tim Lee Davey team 96-138-01; the carbon chassis would be severely tested a few laps later. (P)

Oops! The VSL carbon chassis is tested for real. Lee Davey invited Vern to co-drive the car. An accident on lap 19 put paid to any glorious finish; fortunately the driver and chassis survived fully intact and undamaged, but new bodywork was required! (VS)

Silverstone 1990: Giovanni Lavaggi/Tim Lee Davey. (TLD numbered the ACT carbon chassis car 962-138-02.) 1990 WEC: 28th on grid, 13th overall. Shakedown pre Le Mans. (P)

At Le Mans 1990, the customer TLD numbered chassis 962-138-01 with Patrick Trucco/Max Cohen-Olivar/Katsunori Iketani; from 41st on the grid to 26th overall. The sister car No 20 was to finish 19th overall. (P)

Vern continues: “We were already developing some of our own components – bodywork, turbochargers, brake callipers, etc. So when we were approached about building the street-legal cars by Kosho, we were a long way down the road. Following the Takefuji car fire, when I faced up to the real possibility that one of my drivers could have been badly hurt, I decided to concentrate my energies on running the team, which would also involve giving some young drivers I rated highly, such as Rickard Rydell, Thomas Danielson and Thomas Mezera from Australia, a go in Japan, essentially to gain some experience in a 962 before heading off to Le Mans in 1990.”

The first of seven ACT carbon chassis arrived in February 1989. The chassis would go to a customer race team, the Tim Lee Davey team, where it was built up using a 2994cc Porsche Group C engine. Unfortunately, its first outing ended in an accident on the 19th lap at the Spa 1000km round of the World Endurance Championship (WEC)

on 17 September 1989.

The Tim Lee Davey numbered 962 (Schuppan chassis) records are as follows:

962 Carbon car 138-01 – Tim Lee Davey.
Crashed at Spa in 1989 the FAT Turbo Express (tub undamaged, bodywork replaced).
10-11 June 1990 Le Mans: No 19, 26th overall.
23 June 1991 Le Mans: No 54, did not qualify.

962-138 10-11 June 1990 Le Mans: No 20, 19th overall.
Le Mans ACO records state this was a new carbon chassis with Kevlar bodywork, though there is a question over this point.

The Omron-sponsored Vern Schuppan-run entry at Le Mans 1990 was a carbon-chassised version. It was the second Schuppan ACT carbon chassis to be built, entry No 55, called the TS01C.

Racing apart, there were problems looming for Vern with the road cars. Vern Schuppan: “With the advent of the 1989/90 financial crisis, the golf course and hotel market had collapsed. The road-going 962 project was to be taken over by one of Japan’s premier exotic car companies, Art Corporation, who ordered 25 cars with an option for 25 more. This story is long and complicated – in short, Art Corp had banked on selling the cars ‘off plan.’ When that didn’t happen, and while we and others were in the thick of the financial crisis, they pulled the plug, leaving me and almost 100 workers and subcontractors, not to mention our many suppliers, in dire straits! After building up a fine team, all of whom had put in a tremendous effort, it was terrible. The Japanese backers maintained that they were not cancelling the order, however they would not take delivery of cars unless they had been pre-sold.” Part of the arrangement with Art Corp would see Team Schuppan running two Art Corp/0123 cars in the 1991 Le Mans. Things did not go as smoothly as they might have done.

Vern Schuppan/Eje Elgh at the Suzuka 480km on 8 April 1990: from 20th on the grid they would finish 9th overall. The car was listed as the 962-008, and also as the TS-01C. (P)

Le Mans 1990: the TS-01C, 21st on the grid. They would go the full distance to 15th overall on 326 laps: Eje Elgh/Thomas Danielsson/Tomas Mezera. (TC)

Note the low-downforce Le Mans spec bodywork in comparison with the Suzuka race. (TC)

The CR Prototype Schuppan carbon-fibre road car. (VS)

Listed in records as TS 962-02C at Le Mans 1991. Trevor Crisp says: “The TS-02C always ran a 3.2-litre with high water pumps and heat exchangers rather than oil coolers.” Pictured here well on the way, until after 202 laps, the head gasket let go at 06.55h on the Sunday. (P)

Silverstone, 19 May 1991: round 3 of the SWC (Sports car World Championship) – Jonathan Palmer/Eje Elgh 15th on the grid, but a dnf on lap 33; chassis TS 962-02C, said to be the most advanced chassis of its time. (TC)

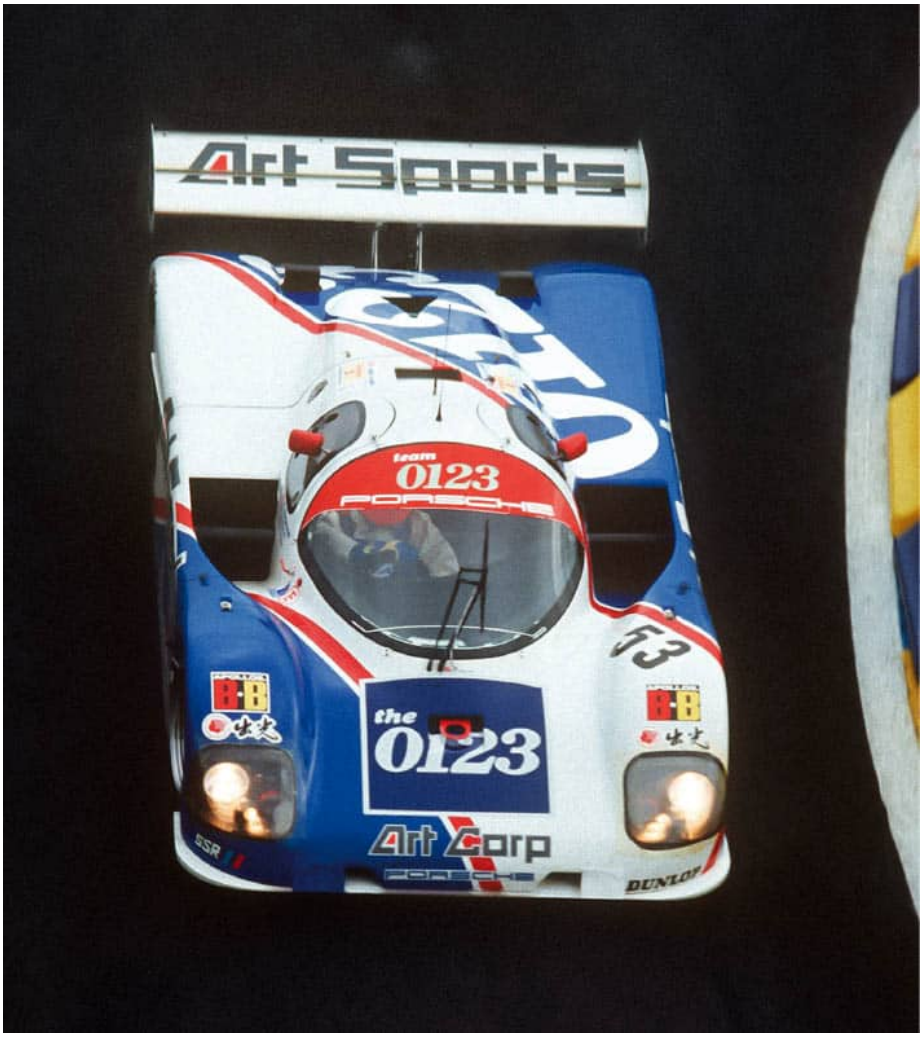
The No 52 Art Sports carbon car TS 962-02C: all was looking good until the head gasket problems. But the No 53 Team Schuppan entry had even more dramas. (P)

A fourth carbon chassis had been created and entered as No 52 for Le Mans 1991, as chassis TS 962-02C. It had been tested at Silverstone on 19 May 1991, prior to the main event of the year.

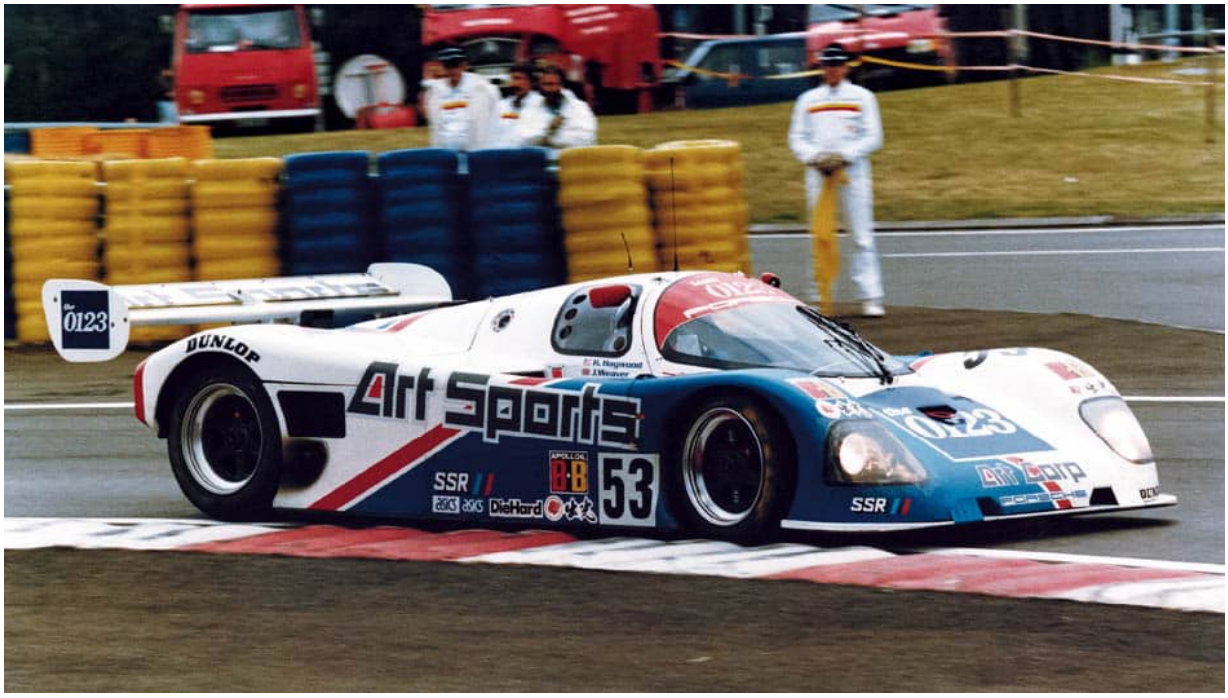
The fifth carbon chassis Schuppan was the 962-TS03C. It was decided to put the aero work out to a designer who was involved formerly with Aston Martin, Max Boxtrom. He was responsible for a redesign of the bodywork that resulted in the car we see below, with the curved front bodywork and low-slung rear wing. Vern Schuppan says: “The wind tunnel model he presented to us (Howden Ganley, Ray Borrett and myself) was all about the aerodynamic merits of the underbody design. Unbeknown to us at the time, the model had never been in the wind tunnel and, when run at Bruntingthorpe, the underbody and rear bodywork that had been designed, delaminated. We had everything redone under Ralph Bellamy’s supervision in

carbon/Kevlar composite, just in time to make it to Le Mans, only to discover, when on the Mulsanne, the front wheels were virtually lifting off the ground!"

It was to turn out to be a disaster in practice, with driver Wayne Taylor returning to the pits in a state of horror. As Trevor Crisp explained to the author: "He was ready to walk, and said that if he had to race the car he was going home. The aero package looked nice, but in effect it was causing very strange handling problems, the reason for which I only really found out when we restored the car some years later." With practice on Wednesday 19 June coming up, there was only one solution. Fortunately, Vern had the foresight to have a back-up plan and the team had race-prepared and entered a T-car, chassis 962-146, the factory chassis Takefuji car used in 1990 that was 12th overall. The car ran in practice on the Wednesday night, with Vern himself doing a few laps to check the handling and make sure the car was okay. With the T-car carrying only the number 53 over the plain red-painted body, it qualified 33rd on the grid. It was soon all hands to the pump to get the 146 chassis car prepared with Art Sports livery for the race.



Chassis TS03C: one-off car with special bodywork for Le Mans 1991. The car was withdrawn because of its performance. Vern Schuppan says: “The aerodynamics were so dodgy we couldn’t run the car and pulled it from the race.” (P)



Practice at Le Mans 1991: Trevor Crisp says that Wayne Taylor, driving, was ready to walk, saying if he had to drive that thing he was going home! The reason – aerodynamics were causing a wayward direction of progress. (VS)

Come the race line-up, the team hoped its troubles were over, but they were not. 22 June was a tricky time at the office. Weaver, driving first, would experience an oil leak on the warm-up, and on the formation lap discovered the right-hand door was not closing. It took ten minutes to fix. This, and then settling the car in again, lost the team seven laps in the first hour. The door hinge had to be changed again at 23.00h. Hurley Haywood had already been in with a cracked windscreen. Back on track, they soldiered on through the night until 10.00h, when Wayne Taylor brought the car into the pits with brake problems, found to be fluid. Then at 14.00h on the Sunday they had to change the windscreen. At the end they were 46 laps down on the winner – finishing, but unclassified.

The carbon chassis road cars had attracted interest from Porsche. Vern Schuppan: “Norbert Singer said we might be interested in taking some of those chassis and selling them on to our customers. As already mentioned, Porsche had had one of the carbon tubs, and did

all the torsion tests, etc; it was pretty good." However, during 1989 dark clouds were on the horizon; as mentioned earlier, the deal with Nomura (Kosho), its hotels and golf courses had fallen through. Schuppan looked into other possible deals. Delays occurred, not of Schuppan's making; the tooling for the road car was in place, the hi-tech carbon composite coachwork looked a million dollars. It was a fabulous road-going sports car for the affluent connoisseurs to savour.

The formerly red car on the Wednesday: the Art Sports 0123 team 962-146 (aluminium chassis) at the 1991 Le Mans, now renumbered as 53, having qualified with plain red bodywork. James Weaver/Hurley Haywood/Wayne Taylor. (P)

The project was heading for the rocks, and here we leave Vern to have last word: "Following the withdrawal of Kosho in 1989/90 from the Le Mans road car project, our Japanese marketing associate arranged a meeting with Art Sports, who were requesting worldwide

rights and an arrangement whereby they would buy 25 street-legal Schuppan Le Mans bodied 962s and an option for 25 more. Much of the initial testing using the Thompson chassis 962 – which Team Schuppan had run at Le Mans for Takefuji in 1988 as a 'mule' – had already taken place for Kosho. Rough road and emission testing continued at MIRA until finally the 2.6-litre air/water Group C Porsche engine met European emission standards. When Art Corporation took over the Kosho project, the carbon body moulds and tooling had been completed and VSL was ready to commence building one of two cars that Kosho, although having pulled the plug, were still committed to take. At this point the Art Corp people decided that they would like a much more GT-looking car, more along the lines of the Jaguar XJR, which Art believed was its main competition when it came to sales. This presented a major delay. A new body needed to be designed and accepted by Art. Three top design specialists were engaged, each independent of the other, to come up with a GT concept road-going 962 Group C Porsche Le Mans car. It was Mike Simcoe, who at the time was based in Detroit at GM's Saturn factory, who penned the beautiful 962CR for VSL. Mike himself flew back and forth to the UK to oversee (and work on) the construction of the full-sized body back at VSL. The downside to this major change from the ready-to-build customer VSL 962 Le Mans-bodied cars meant that the whole process was set back by at least a year: to do this in a year was in itself an astounding feat. Following the completion of the CR prototype, some 12 months later, *Car Graphic* magazine, which had been following the project, came over to the UK to witness the now-completed car, along with Art Corporation's head people, who were present to photograph the CR during some laps on the high-banked MIRA test track, and a handover launch party at the VSL factory. The CR Prototype was handed over to Art Sports at our VSL premises in Lincoln Road, High Wycombe, on 5 July 1991.The following day, it was flown to Japan for an Art Sports launch in its prestigious Osaka showrooms. There were no VSL personnel present at the launch, and they only found out when contacted by Porsche that the Schuppan 962CR badge had been removed (culprit needs to remain nameless) and replaced with a Porsche badge, Art Sports claiming that they had

the worldwide rights to the Porsche supercar. Porsche was furious and withdrew all support, refusing to provide engines, gearboxes and other vitally important Porsche components. Eventually Andial, based in California, agreed to develop a road-going version of the Porsche IMSA motor, which meant further modification and re-tooling, not to mention going through the complicated and challenging emission testing and approval again."

Vern and Jennifer Schuppan, the Schuppan Racing Team, had become a respected force. With a road car future, all was looking good until a set of circumstances beyond Vern's control, caused by un-nameable individuals, rendered the company hors de combat. (VS)

A rare sight on any road, the hologram CR 962 badge. (RS)

Final example of the beautiful Vern Schuppan 962CR road car: Vern behind the wheel at his Berkshire home with Australian friend and VSL employee looking on. (VS)

Art Corporation pulled out of the deal in March 1992. Schuppan and his team had tried every possible route to stay in business, including frequent long-haul trips to negotiate a reduction in the number of cars to ten, and later to just three. Art Corporation, though, would not be moved further. VSL had made a huge investment, not just in developing a (second) CR Prototype and tooling up for the production cars. It had acquired larger premises to deliver the contract and closed the racing team, but in spite of all these efforts, VSL was eventually forced to call it all a day.

To the best of our knowledge, these are the Schuppan carbon Advanced Composite Technology chassis:
(Note: source – former Schuppan team member, Trevor Crisp at Katana, whom the author thanks for this research.)

962-138-01: Assembled using the first ACT chassis manufactured in

February 1989 and carried the ACT plate TS-962-89-001. It first raced on 17 September 1989.

TS 962-01C: Assembled using the second ACT chassis, which was manufactured in June ’89 and carried the ACT plate TS-962-89-004. The car had the latest MP1.7 Bosch Motronic system. The car was built up at VSL for Team Schuppan to run for Omron in the 1990 All-Japan Championship and Le Mans. The author was advised that the Omron car remained in Japan “until at least August 1991.” After that the car must have been shipped back to VSL in the UK, and VSL used this car as the basis for the CR prototype.

962-138-02: The third ACT chassis was loaned to Tim Lee-Davey to put on show for a potential sponsor and then assembled by TLD for Le Mans 1990 (No 20), 19th overall. Chassis tub returned to VSL after Le Mans, the standard 962-138 car being rebuilt back to its original 138 factory chassis specification.

TS 962-TS02C: Built in March 1991, believed to have been built on the returned tub 962-138-02 chassis, debuting at the Silverstone SWC in May. Raced at Le Mans 1991 No 52 and finishing 3rd overall at the 1992 Daytona 24 race, also as No 52.

The Boxtrom-bodied car TS-03 (left) alongside the 962-146 in December 1991: testing prior to the 146 being shipped over to Daytona for the 1992 24 Hours. (TC)

TS 962-03C: ACT chassis TS-962-89-005. Built up in May 1991, No 53, Boxtrom body. Attempted to qualify at Le Mans, but withdrawn due to aero difficulties.

There were five race cars, utilising four of the original batch of seven ACT chassis, with the remaining three being used to build the three LM road cars.

There were two engine variants of the road cars: the LM, which was basically a 962 race car complete with a 2.65-litre, four-cam, air/water race motor and the CR, which had the new Mike Simcoe-designed GT-style bodywork with a 3.3-litre fully air-cooled IMSA-based two-valve motor.

All of the LM-bodied cars were fitted with 2.6-litre air/water 956 Group C engines. This included the competition version of the 962-CR, which VSL built during the manufacture of the two customer CRs for Art Corp. Schuppan did have further carbon chassis built by Reynard, but these were specifically made for the CR road cars, as

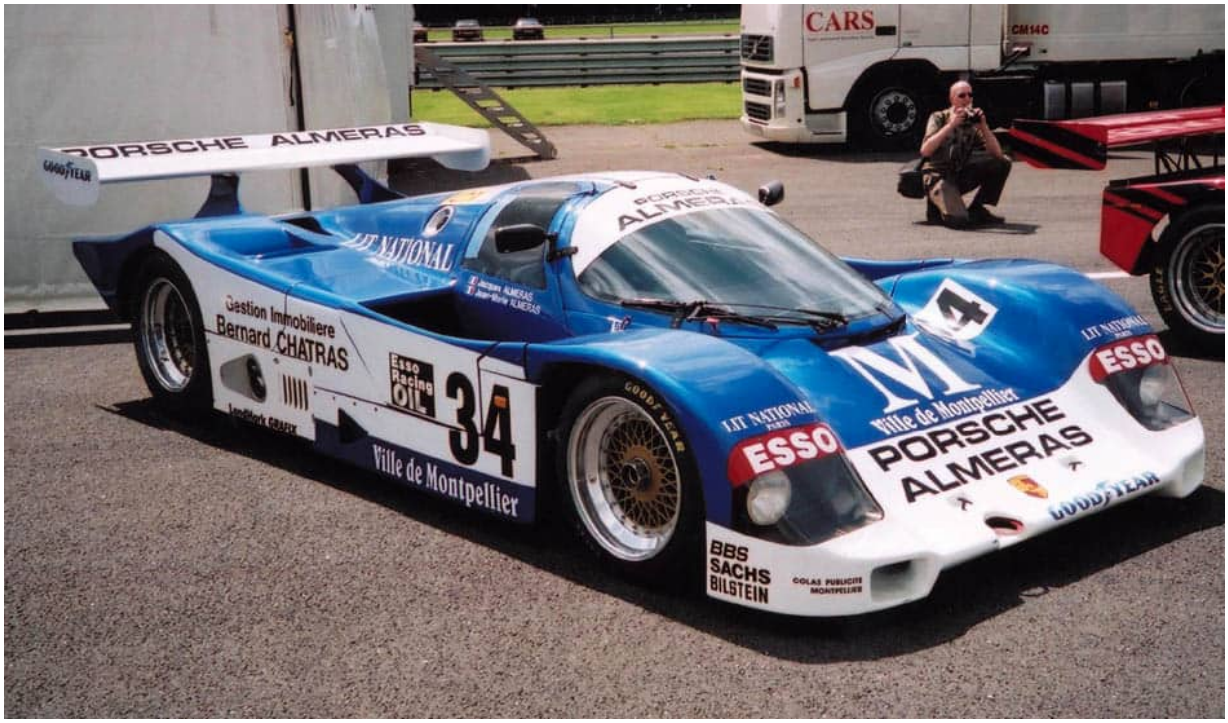
they were two inches wider to provide more cabin room.

♦ ♦ ♦ ♦ ♦

Almeras-Porsche

By 1989 the Group C era was drawing to a close in Europe. Then along came the new management in the FIA and Formula 1 who desired to switch to 3.5-litre engines, and plans were afoot to get the sports car fraternity to switch to 3.5-litre. Well, as we have seen, a row ensued. The ACO, organisers of the Le Mans 24 Hours, were also having none of these ideas to bring sports car racing nearer to F1, so withdrew its race from the World Championship from 1989 to 1990. There was to be some reconciliation for 1991.

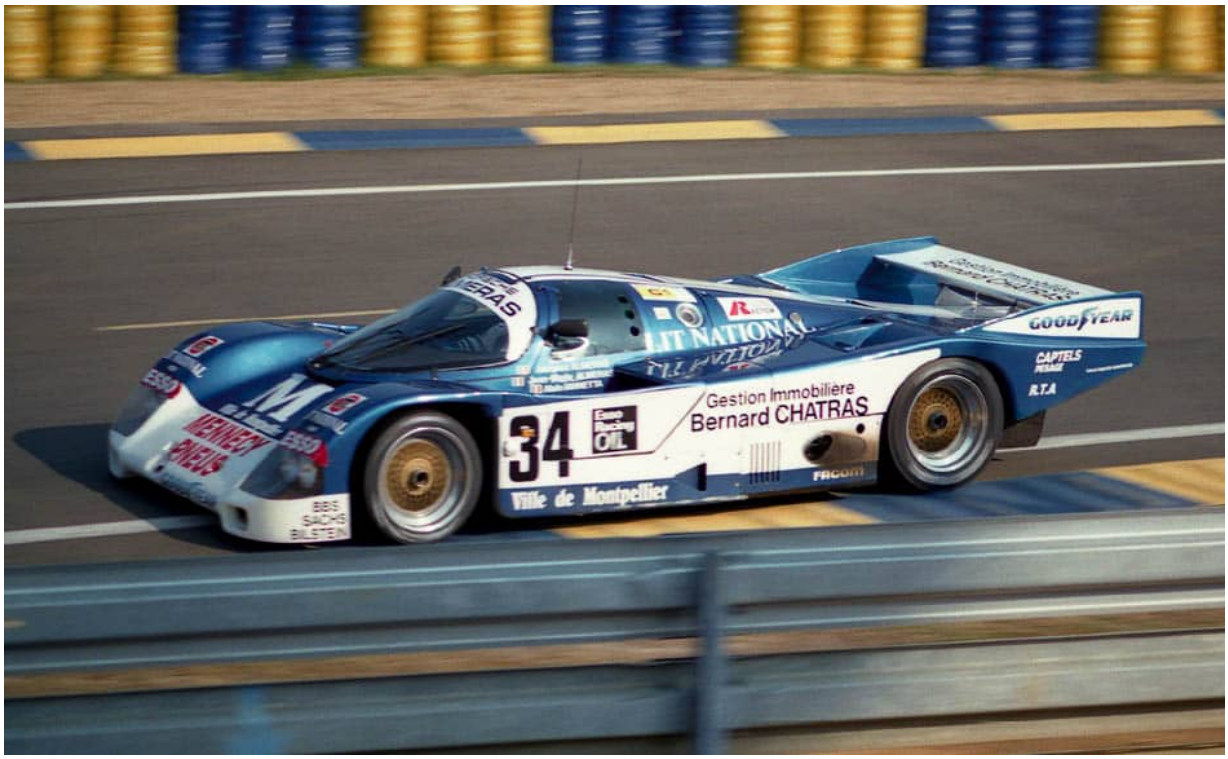
Into this atmosphere came another new team: that of the Almeras brothers. Not unfamiliar to motorsport, the brothers Jean-Marie and Jacques had been racing Porsches for many years and were in very good contact with the factory, using both factory-created cars and with cars they made themselves. These men were and are skilled operators; they had acquired the ability to create cars due to their experience from their original bodywork business.



The 962 first car acquired from Kremer with the British Thompson honeycomb monocoque tub (No 110) created for the Kremer Bros and listed as a CK 2, seen here at Silverstone, England. Relatively late arrivals to the World Sports Prototype Championship, the Almeras brothers' first event was the Coupe de Dijon in France on 21 May 1989. (JS)

Therefore it is no surprise that following the successful years with its 911s and 935s, plus the creation of a spectacular car it called the Bi-Turbo 33 Almeras, the Montpellier (France)-based equipe eventually turned to racing a 962 Porsche in the World Sports Car Championships.

The first race was to be the Coupe de Dijon in May 1989. The brothers put their car on 19th on the grid and finished 19th. Next up would be Le Mans: Alain Ianetta joined Jean-Marie and Jacques for the race, but it did not end in glory, as the car was involved in an accident on lap 188 early on Sunday morning.



Le Mans 1989: Jean-Marie and Jacques Almeras were joined by Alain Ianetta to put the car 35th on the grid; all was looking good until lap 188, when an accident soon after 05.00h on the Sunday put paid to future progress. (AJFR)

Brands Hatch, 23 July 1989: from 29th on the grid to 10th overall, Jacques and Jean-Marie Almeras in the 110CK2 former Kremer car Thompson-built chassis. (P)

The No 34 962C-110CK-2 would run again at Jarama on 25 June, where the brothers finished 12th overall from 17th on the grid. Then at Brands Hatch on 23 July, after qualifying 29th on the grid, they rose through the field to finish 10th overall. At the Nürburgring on 20 August they finished 14th, and followed that result with 21st place at the Spa, Belgium, round 4 of the World Sports Prototype Championship on 17 September. They then made the trip to Mexico and 107 laps of the 2.74-mile circuit on 7 October, where they were to finish 15th overall from 26th on the grid. All in all, a reasonably successful first full season.

However, they had bigger plans. Winter 1989-90 was entirely devoted to preparing a new car, which would this time be 70% ‘made in Almeras.’ The sole target was the World Sports Prototype Championship, which comprised nine races in 1990. In December, they took on a chassis engineer, Mike Brundt, a former employee of

Charles Ivey and of Kremer Racing. Jean-Marie designed the bodywork; aerodynamics was an area where he thought their 962 could make the difference with the others (there were 14 962s at the beginning of the championship!). The radiators were repositioned on the sides; the air intakes and outlets were modified for more efficient flow and cooling. The creation of a new front end was designed to overcome the serious understeer which they found present during the 1989 season, the curved part being adjustable. Three different aero components were created that could be attached to the front in order to achieve the best aerodynamic effect according to the circuit. The rear bodywork streamlining was in two parts, and was lowered by about 10cm from the standard to allow the wing to work in what they thought were the best conditions. The wing was fixed directly to the transmission. Jean-Marie redesigned the suspension and set it to operate in a horizontal plane. The engine was the Porsche 962 3-litre with the latest Bosch 1.7 Motronic injection. Power was 750bhp; running weight was 900kg.

On Friday 30 March, the press had its first view of the car at a presentation led by Jean-Marie Balestre, then president of the International Motorsport Federation and of the French Federation. There was a sense of surprise, the car’s appearance being very different to those of the other competitors.

The Almeras brothers would develop a new car for the 1990 season with a different design of bodywork, as we see here. (P)

The 1990 season would begin for the team at Monza. The car initially had no sponsors; apart from some small local investment there were no contracts, this was a private effort. “The lack of financial support is preventing the development of our plans. It is a shame that a team like ours, which has built a technologically top car, is not supported by other partners,” Jacques is recorded as saying in the book *Porsche Almeras* by Jean-Marc Chaillet.

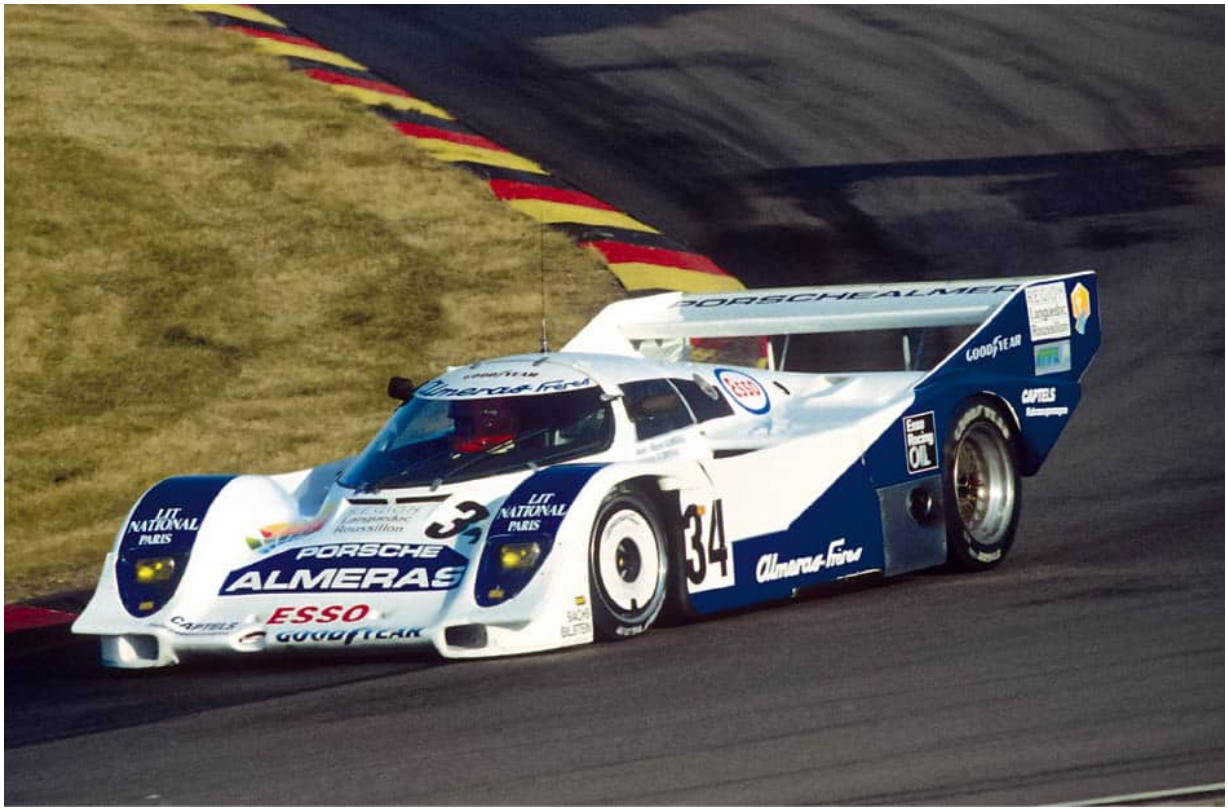
The Almeras team spent many hours in the wind tunnel to improve the aerodynamics and the feed of air to the engine, while conserving the gains of the special profile of the bodywork, but there were still problems. One might think – and it is certainly the view of Norbert Singer – that Porsche had, when designing and developing the 962, spent vast amounts of time and money some years before, getting the bodywork and aero right before supplying customers. They had won many races, so why would you want to change from the work

already done by Porsche?

At Silverstone in England on 25 May the Almeras car failed to qualify, though at Spa on 3 June they were to finish, but only 22nd. At Spa, the Almeras brothers had found the new Thompson-chassised EAF-001 car slow and heavy, and they decided to return to the original bodywork configuration. At Dijon, 22 July, they finished 23rd. In Montreal, Canada, it was 18th. Another disappointment for the team, who had been competing without outside funds since the start of the season. After the final event and another retirement in Mexico, they packed everything up and went home to France. It was time for a rethink.

In 1991 the Le Mans 24 Hours returned to the Championship, and the Almeras brothers decided to concentrate all their efforts on this event alone. If 1989 had been a learning year and 1990 a reality check, they were hoping 1991 would see fortunes changing, taking advantage of the experience acquired with so much difficulty. Concentrating on Le Mans, the team brought on board Pierre de Thoisy, head of publicity for the monthly magazine *Sport-Auto*, as the third driver; he had raced there several times before. He was also well placed to find sponsorship. The blue and green car for Le Mans was supported now by Axe (men's deodorants), again with help from its regional government department, various smaller sponsors, and also Yves Courage, whose name appears on the entry.

Round 5 of the World Sports Prototype Championship at Dijon, with the more conventional 962 front end, 22 July 1990: The Thompson-chassised EAF-001 of Jacques and Jean-Marie Alméras, 23rd overall from 31st on the grid. (P)



Nürburgring, WSPC, 19 August 1990 – 19th overall: the new Thompson chassis EAF 001, built up into the 962C by the Almeras team, returned to the rather more curvy body. However, the tweaks they had done to the bodywork shape were still not working as well as they would have liked, so they returned to a near-standard rear wing arrangement. (PK)

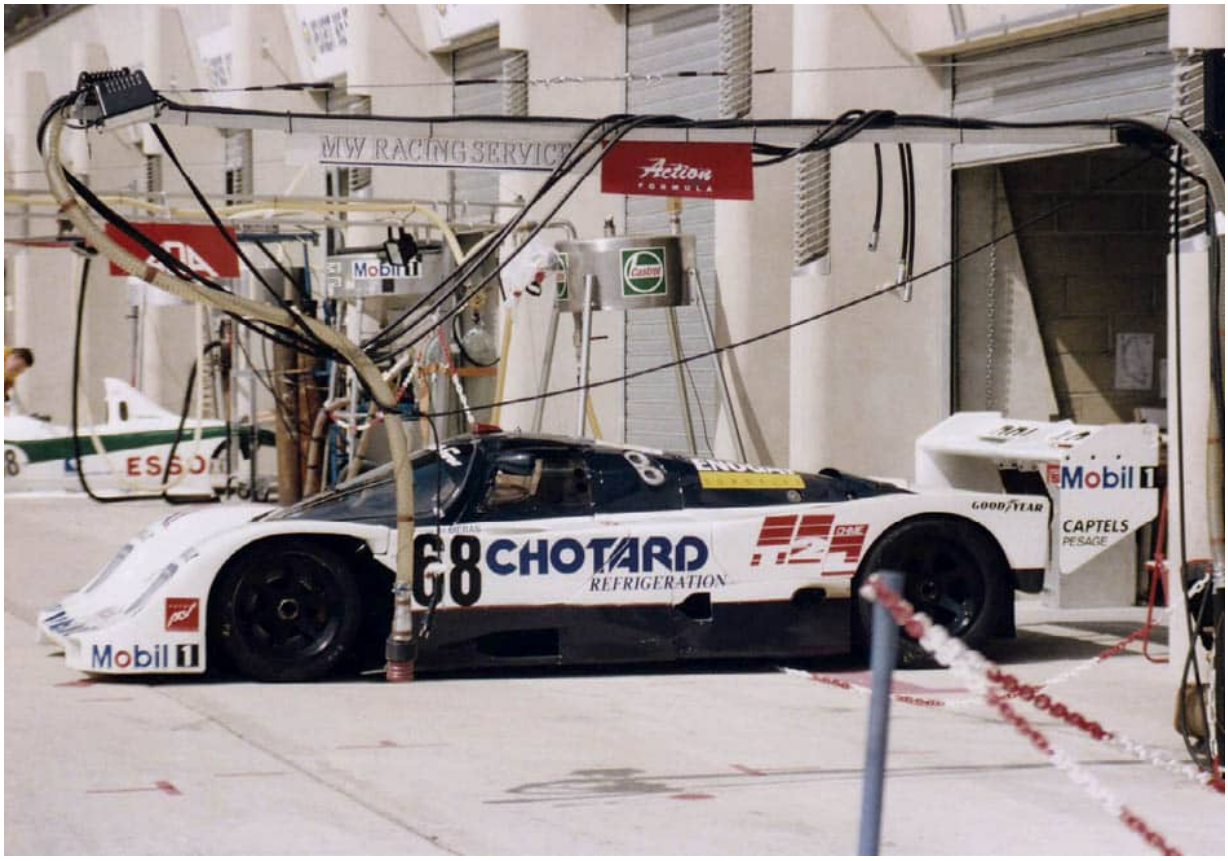
The No 50 car qualified in 34th position. 1991 was the first year for the notorious chicanes – part of the compromise with the FIA – which cut speed on the Hunaudières (Mulsanne) straight. The chicanes would not be kind to the Almeras car. 86 laps into the race they found the brakes taking more stress than accounted for, due to these new speed restrictors; it was becoming more and more difficult to slow the car. Then an accident ensued and the car lost a wheel. Almeras decided to park the 962, and return to the business of earning money rather than spending it, though it was determined to try again in 1992. The car was repaired, the brakes taken care of and Max Cohen-Oliver joined the driving team. Things were looking good, as they

qualified 20th at the 1992 Le Mans 24 Hours. But once again it was an entry to no avail, when an accident caused their demise, this time on lap 85 at 21.00h Saturday that saw the last throw of the dice. Almeras had done a deal with Guy Chotard in 1992 to run the 962-001 GS of the Gebhardt team that he had recently acquired, and at the beginning of the week before the 24 hours, the car appeared in testing.

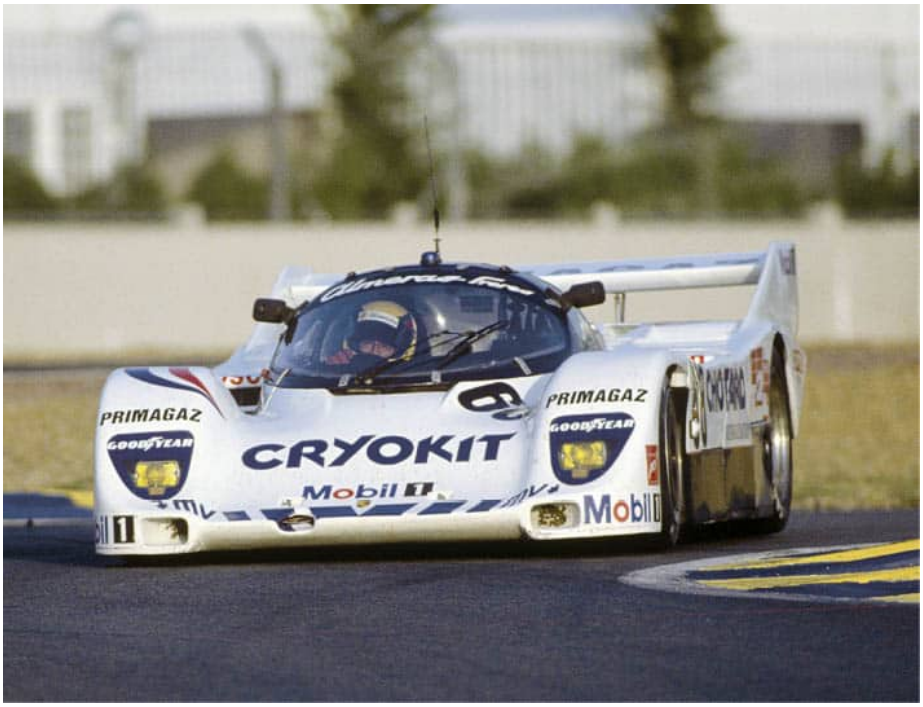
Following the 1992 Le Mans, the Almeras team decided it had had enough of the World Sports Cars and returned to its forte – GT racing – with 911RSR Carreras, and later, GT2s. The former Gebhardt car, 001 GS, was last heard of at the 1993 Le Mans, where it finished 14th overall from 20th on the grid; it was entered by Guy Chotard, with Denis Morin/Didier Caradec/Alain Sturm at the wheel.

Concentrating only on Le Mans for 1991 rather than the World Championship series, the Almeras brothers had returned the EAF 001 to near-original 962 configuration. They lasted until 10.14pm, when Jean-Marie retired the car, following a severe off-circuit adventure. (AJFR)

Le Mans 1991: Jacques and Jean-Marie Almeras in the Courage/Alméras-entered Almeras 962C Thompson EAF001. Unfortunately a big off on lap 86 saw the car dnf. (PK)



The Gebhardts' 962-001GS acquired by Guy Chotard being run for Chotard by the Almeras team. It only ran in testing, the Chotard Almeras team reverting to the Almeras EAF001 Thompson-chassised car. (FG)



Parking up the Gebhardt car, Almeras qualified the EAF 001, carrying No 68 and supported by the Chotard company Cryokit. (AJFR)

Both non-finishers at the 1992 Le Mans 24 Hours: the 55 Cougar C28S of Robert/Fabre/Brand is passed by the 68 car of Almeras brothers/Cohen-Olivar. The No 55 went out in an accident on lap 77, while the Almeras car was also to go out in an accident on lap 85. (AJFR)

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Dauer-Porsche

As the reader will certainly be aware by now, there were many changes over the years to the regulations at Le Mans, and in the various versions of the official World Prototype Championship, often to the frustration of the manufacturers. Porsche was not excluded from this situation and by 1992 the 962s racing in the Championship were decreasing due to those rule changes and also Porsche was concentrating on other areas of motorsport, though still supporting existing customer teams. The specialist chassis suppliers had sprung up, and several teams were building their own 962s. Jochen Dauer Racing, soon to be Dauer Sportwagen GmbH, was to be part of an interesting idea. Dauer was no new boy to racing; having started in 1977, he had raced 73 times, starting in BMWs and saloons right through to the top class of C1 sports car racing. The 1980s had seen

him compete on a regular basis, but the top spot eluded him in this era. With the number of 962s around the world, it was inevitable that a few would become road cars, as can be seen from the Schuppan story, where we saw a special road car born out of the 962 design. Dauer had acquired the John Fitzpatrick team in 1986 along with the team car 962-112. This was run by Dauer in Victor livery in 1987, eventually to go on to the Dahmen team in 1988 and renumbered. Dahmen applied its own references. Dauer entered a 962 into the Kyalami 500km in 1987. Dauer also had a new car on order from Porsche which would be a factory car, chassis 133. In the later part of 1987, Dauer had also acquired two new chassis from John Thompson, one of which would go eventually to Gebhardt. By the end of 1987, Dauer had three chassis. The reader might notice, when looking at other records, that Dauer was using a 962-133 chassis in 1987. But, in fact, the factory 133 was not supplied to Dauer until June 1988, meaning that there were two cars that ran for a short time with chassis number 133. As Trevor Crisp told the author: “The door latches and fuel filler caps are different, the factory 133 using the later-type electronics fitted to what are known as MP1.7 system cars, as opposed to the 112 which has the MP1.2 system cars of the earlier type. What had happened was that Dauer had renumbered the chassis for the early part of 1988.”

The actual 962-133 Porsche-supplied tub that was the subject of confusion with the 962-112: Jochen Dauer himself, accompanied at Brands Hatch in the WSPC round on 23 July 1989 by Will Hoy, here on the warm-up lap. A frantic start, with several cars involved, resulted in a holed radiator on the first lap and a dnf. (JS)

The reader might like to look at race records, which in some cases show a 133, and in others 112, racing at the Norisring in June 1988. There would be no doubts about the 133 racing at Brands Hatch in 1989: as seen in the accompanying image.

The Porsche-supplied 133 car was later built into a Dauer road car for the Sultan of Brunei. Also, the author was informed that 962-172 was likewise built into one of the Sultan's road cars. With the rule changes in the World Sports Car Championship, the ACO began to think about a reintroduction of production-based GT cars at Le Mans 1993. Porsche, and indeed Dauer, saw the possibility of something interesting. The ACO at Le Mans, however, was not part of the new, BPR Championship, mentioned earlier. Le Mans was a stand-alone event. It seemed that the Automobile Club de l'Ouest (ACO) had not

specified how many road-going cars had to be manufactured to qualify in its homologation requirements for the 24 Hours – only that they had to be road legal in their country of origin.

As we have seen at the beginning of this chapter, Fabcar had supplied a number of chassis to Porsche; amongst them were 962C 169, 962C 173, and 962C 176.

The chassis tub 962-169, the first one, would become a road car. The first road version being shown to the public in 1993 was called the Dauer Le Mans. All three had been renumbered by Porsche.

962C 169 Porsche	Dauer	Made into a road car	Renumbered 962 LMGT 001
962C 173 Porsche	Dauer	Le Mans 1995: 3rd	Renumbered 962 LMGT 002
962C 176 Porsche	Dauer	Le Mans 1995: winner	Renumbered 962 LMGT 003

The Dauer road car had the capacity in space terms to carry luggage! Ekkehard Zimmerman, the body manufacturer who had assisted Kremer and Joest, had also built a 962 road car, and it had gained German Type approval, so there was a precedent. Dauer had created the aforementioned road-going 962 from the 962-133 chassis. Norbert Singer, ever alert to an opportunity, wise beyond measure, and with a wealth of experience, already knew about these cars. He was a huge fan, naturally, of the 962: it was his baby, and he had followed it as it grew up. He read the GT rules for the 1994 Le Mans – there was no mention of numbers of production cars to compete in the GT class! Porsche had not won at Le Mans since 1987; its name had metaphorically dropped off the winning radar. Singer wanted to win it again, so spoke with Horst Marchart, the new technical chief at Porsche, who put Singer's idea to the Board. His idea was to take a 962 chassis road car, that had been built by Dauer, into house at Porsche, and look at building a race car from it, then enter a model of the same car as a GT car at Le Mans, but, in fact, underneath was a full blown 962 race car, utilising all the latest technology. Norbert Singer told the author: "They just told me, do it!" (they being the Board at Porsche, the full story can be read in Norbert Singer's book 24:16).

Plenty of room for luggage; well, maybe! Jochen Dauer had stopped racing and decided to build a 962 GT Road car; the first, shown to the public at the 1993 Frankfurt show, was called the Dauer Le Mans. (P)

The Dauer car acquired by Porsche needed a lot of work, but the basic principles were there. The company worked closely with Dauer to get the road car spot on first, so that it met both the racing regulations (secretly), and could get German Type approval as a road-going GT car. By March 1994 it had succeeded: Type approval was achieved for the GT as a road car. So now it was time to get race ready – two cars were prepared between March 1994 and the Le Mans 24 Hours. The entry was accepted in the GT Class, and on 8 May 1994, Dauer turned up at the pre-qualifying session. The Dauer-Porsche passed the scrutineering inspection, and complied with the ACO's rules. Hans Stuck Jr drove it, and turned in a lap of 3min 52.32sec, just over five seconds slower than the fastest on the

day, a Courage-Porsche C32 Sports Prototype.

Norbert Singer smiled. The ACO gasped. Once more Norbert Singer had done his homework, even down to the fact that Type approval in Germany did not require 'bumpers' on road-going cars. This was a question the ACO inspector Alain Bertaut had raised. "You can't do that," he is reported as saying, "making a race car into a road car, and then converting the road car into a race car." Norbert Singer told the author: "I told him, well, we have done it, and what's more it meets your regulations." The ACO had to agree and capitulated, but it is recorded as saying: "The car is legal within the letter of the rules, but in the spirit of the rules it's wrong. We will change the rules for next year."

The Dauer road car 962LM GT002, now suitably modified to meet the regulations set out by the ACO for racing at Le Mans. Hurley Haywood/Mauro Baldi/Yannick Dalmas/Danny O'Sullivan/Hans Stuck Jr/Thierry Boutsen. (P)

Three chassis had come originally from Fabcar in the USA to

Porsche. Porsche itself would have the Joest Porsche team to help out with the racing organisation at the 24 Hours.

The two cars that would race were given the Nos 35 and 36. The drivers were the cream of the Group C era:

35 – Hans Stuck Jr/Thierry Boutsen/Danny Sullivan

36 – Mauro Baldi/Hurley Haywood/Yannick Dalmas

Porsche even took the third car along to the race as a road car to display and prove its point.

The race qualifying saw the 35 car on the grid at P5 and the 36 car at P7. As the race got under way, it was the No 2 Courage-Porsche and No 5 Kremer-Porsche that shot off up the road, but, as expected after qualifying, the Dauer examples were not far behind. The No 2 Courage stopped altogether on lap 142, and the No 5 Kremer slipped down the field. Come Sunday, and with 90 minutes to go, it looked like the No 1 Toyota 94c that would win, but when it pulled into the pits at 14.29h with a broken halfshaft, the Dauer-Porsches moved into 1st and 2nd places; the 36 car ahead of the 35 car. At the line, as the chequered flag came down, the 36 car crossed the finish line in 1st place. A GT car had won Le Mans! It looked like a 1-2, but in a terrific fight-back by the Toyota of Mauro Martini/Jeff Krosnoff/Eddie Irvine, with Krosnoff at the wheel, the Dauer second car was pushed into 3rd place. The 962 Dauer had covered 4685.701km to the 4667.566 of the Toyota, with the 3rd-place Dauer on 4667.552km. A close finish.

The Dauer road car sits between the two 962 GT road (ahem) race cars! The full team ready to race at Le Mans. (P)

36 leads 35 in the sunshine at Le Mans; the pair would finish 1st and 3rd. It would have been a 1-2 but for the tremendous fight-back of the Toyota 94V of Mauro Martini/Jeff Krosnoff/Eddie Irvine. (P)

1994: a road car wins Le Mans! In the Dauer 962 LMGT 003, Mauro Baldi/Hurley Haywood/Yannick Dalmas take the rules to the limit and put the Dauer-Joest-Porsche-entered car on top of the podium. (P)

Missing 2nd place by 0.14 of a kilometre! The number 35 of Dauer Hans Stuck Jr/Thierry Boutsen/Danny Sullivan after a hard fight with the 2nd place Toyota 94CV. (P)

Soon after the race the ACO changed the rules for 1995! That year was to see the new McLaren F1 GTR, designed by contributor to this work, Peter Stevens, take a first victory. However, Porsche would be back, with a certain Mr Reinhold Joest playing a major role in 1996. Dauer would build a number of street cars, all owned by the Sultan of Brunei – the last three numbers in the list below are the original factory 962 chassis numbers. (Courtesy of Trevor Crisp, Katana.)

Dauer	BP962	TP99620175
Dauer	KF9911	TP99620172
Dauer	BQ7162	TP99620141
Dauer	BQ7523	TP99620151
Dauer	BQ126	99620133

♦ ♦ ♦ ♦ ♦

Joest-Porsche – Part 2

As we have seen in the previous chapter, Joest-Porsche Racing was a well-organised force to be reckoned with in the 1980s, and highly respected by Porsche itself. Cooperation was frequent. Porsche, since ceasing involvement with the production of 962s, was to cooperate to a larger extent with the Joest team, because, as we saw with the 936 Porsche, Joest was able to build up its own cars. We return to some of these to see how the team ran on into the 1990s.

962C Joest 012: although a factory-supplied chassis, it was made up into a car by Joest (so qualifies to be included in this section of the story), Joest was supplied the Porsche Werk spare tub 962-149, which was renumbered. This 962 would race as a Class C1 car in the World Sports Car Championships: at Suzuka on 8 April 1990, where it dnf'd due to a fire in the pits; Monza resulted in a 5th place; Silverstone on 20 May where it was to finish 4th; at Spa, in Belgium, it finished 7th; 7th again at Dijon on 22 July; 6th at the Nürburgring on 19 August; 7th at Donington, England, on 2 September; and finally 6th

at the Montreal, Canada, round on 23 September. Bob Wollek/Frank Jelinski drove on all these occasions. 1991 would see it finish 7th at Le Mans, in the hands of Derek Bell/Hans-Joachim Stuck/Frank Jelinski.

Ending its run in period in the Interserie races, in 1991 it won at Brands Hatch, driven by 'John Winter' (Louis Krages); 3rd in Czechoslovakia (the Most circuit), again 'John Winter'; and 6th at Jarama in the hands of Gianpiero Moretti.

1991 Le Mans: the Konrad Motorsport-entered Joest-Porsche 962-012 makes a pit stop; Derek Bell waits to climb in. Stuck/Jelinski/Bell 16th on the grid; the car would rise to 7th overall at the flag. (P)

962C Joest 013: This car utilised Porsche Werk spare chassis 962-153, renumbered, and built up and run by Joest. This car was also a C1 example. It was scheduled to run at Le Mans in 1990; however, a huge crash in the first practice session between the Mulsanne chicanes, with Jonathan Palmer at the wheel, rendered the car hors

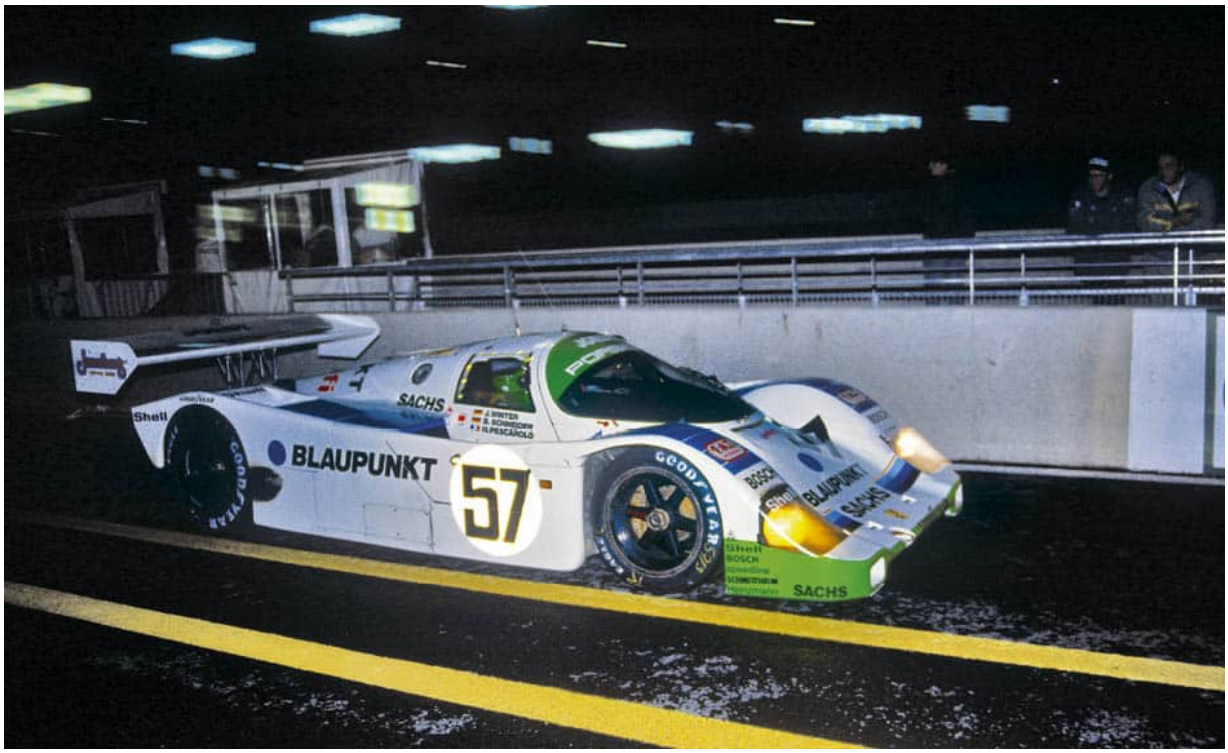
de combat.

962C Joest 014: Like the two previous cars, this one used a Porsche tub that had been a spare; it was 962-156 tub but made by Stickel and renumbered. The car ran from 1990 to 1993, starting as a C1 car at the Suzuka WSPC round 8, where it finished 11th for Jonathan Palmer/Henri Pescarolo. At Silverstone, though, it dnf'd on 20 May. Here Palmer was joined by Tiff Needell: they qualified the car 5th on the grid. At Dijon in 1990 the No 8 car finished 8th, David Hobbs joining Palmer on that occasion.

A dnf followed at the Nürburgring; a 10th at Donington and an 8th in Montreal rounded off 1990. Numbered 57 at the 1991 Le Mans 24 Hours, it overheated and dnf'd, but it took an Interserie victory at Brands Hatch on 28 July. Races at Most and the Österreichring followed, with the year rounding off at Mexico City, with the car in Momo colours, and in the hands of Gianpiero Moretti and Derek Bell, 5th overall. Rested during 1992, it came out as a Category 2 car for the Le Mans test weekend on 16 May, where it came 7th in the timing lists, and ran at the 24 Hours on 20 June, where Bob Wollek/Henri Pescarolo/Ronny Meixner finished 9th overall.

However, 962-Joest 144, another Joest car, is thought to be constructed from a Porsche Werk chassis. It started life as a Dauer car, prepared by Joest in a long-tail configuration, and was race managed at the Le Mans race of 1990 by Siggi Brunn, but team managed by Hans-Dieter Dechent. Records show the mechanical side of the operation was run by the Gerhard brothers and Peter Munch. A complex operation, worth a mention. Entered by Joest, it raced just twice in Europe in 1990, recording a 14th overall at Le Mans and at Dijon.

(Author's comment: Some may think that to include the Joest-Porsche 962s doesn't quite fit the alternative race cars remit of this book. However, Joest frequently ran the cars of Porsche and others as a management operation and, as we see, Joest cars were also being run by others. So, in this instance, whilst heavily supported by Porsche, Joest is not technically the Werks Porsche organisation, and so I feel its place is justified.)



Le Mans 1991: Bernd Schneider/Henri Pescarolo/'John Winter' retired around 05.00h on the Sunday with overheating, presumed to have been caused by a gearbox oil leak which is officially recorded as the cause of failure. (P)

962-Joest 014 at Le Mans 1993, number 18: Bob Wollek/Henri Pescarolo/Ronny Meixner, 8th on the grid to 9th overall after 24 hours. It was powered by the 935/83 2994cc engine. (P)

The Joest-constructed 962-Joest 144, used by Dauer. At Le Mans 1990 it was run by Siggi Brun and team, managed by Hans Deter Dechent – a complex operation. Henri Pescarolo/Jean Louis Ricci/Jacques Laffite,14th overall. (P)

♦ ♦ ♦ ♦ ♦

Joest-Porsche (TWR)

As we know, since Porsche had withdrawn from sports car racing as an entrant in the late 1980s, it continued to support the many customer teams. This was okay, but from a frontline marketing point of view, the sight of a Porsche car winning races outright was more beneficial than winning the classes with the many 911 derivatives, even though Porsche was regarded as probably the most recognised marque to populate the GT classes. Porsche, though, wanted outright wins again, and on 19 December 1994, after a successful outright win at the 1994 Le Mans with the Dauer-Porsche, the publicity department of Porsche announced it was returning to the World Sports Car Championship for 1995. With that victory in 1994, it was evident that the engine was still good enough. It was also known that

McLaren and Ferrari were developing a new car to the new regulations.

Enter Porsche North America motor sports supremo Alwin Springer. He had been appointed to this role in 1989 after the tragic passing of Al Holbert. Springer, wanting to raise the profile again of Porsche racing in the USA, had gone looking for a new sports car chassis to race in the show-case races in the USA. Tom Walkinshaw Racing had been building the Jaguar XJR series chassis at its North American headquarters, Astec-TWR in Valparaiso. The 3.5-litre Jaguars with their Ford-Cosworth HB V8 engines were very effective in IMSA GTP in the early 1990s. By 1994, the Jaguar XJR 14 was a proven performer.

Hans Stuck Jr, Gary Brabham, Thierry Boutsen: at Daytona pre-testing the WSC Le Mans, 1995. (P)

Alwin Springer (of Andial and, previously, Porsche specialist Vasek Polak) was interested to look closer at the Walkinshaw operation. Discussions took place and plans went ahead for a cooperation. After several years of the FIA, ACO, and IMSA wranglings over formulas, proper World Sports Car Prototypes were back on the agenda as

World Sports Cars (WSC). IMSA, too, had come up with a class for open-top, low-cost Sports Prototypes. The ACO in France also had an open-top class for the Le Mans 24 Hours. IMSA, wanting to attract these cars, came up with the idea of using both normally-aspirated engines, which were free of restriction, and restricted turbocharged engines.

Porsche North America was able to see in Valparaiso the technology that built the successful Jaguar, and as it happened there were two chassis available – one a new car, and the second the Jaguar XJR-14 chassis 691, that was ready for recycling! Both were carbon fibre chassis created in the USA at Astec-TWR, and featured a quickly detachable body where the engine cover and rear end of the car were in one piece, as was the front of the car. Tony Dowe, Walkinshaw's man in charge in Valparaiso, was charged with the project, the target for Porsche North America being the 1995 Daytona 24 Hours. The Porsche Board in Germany gave the go-ahead for participation using the Porsche engines and many components with, of course, the provenance of the Porsche badge. Initial activities began in Weissach in September 1994. Max Welti, then competition chief at Porsche, met with Herbert Ampferer and Alwin Springer along with Jaguar designer Ross Brawn (later Director of Affairs at Ferrari F1, and even later still to win the F1 World Championship with his own car, the Brawn F1, in 2009). Chassis XJR 691-01 became the Porsche WSC-95-01, the new chassis would become the Porsche WSC-95-02. In October, preliminary investigations had shown that IMSA in the USA would allow turbocharged cars to compete in its series. Porsche would choose the type 935/76 2994cc engine, a much used and well known reliable favourite – in fact it is said that one it used was the actual engine that had won for Dauer in 1994, twin turbocharged with a Bosch Motronic MP 1.7 system. All was looking good; it was said they would be at the Daytona 24 Hours in January 1995.

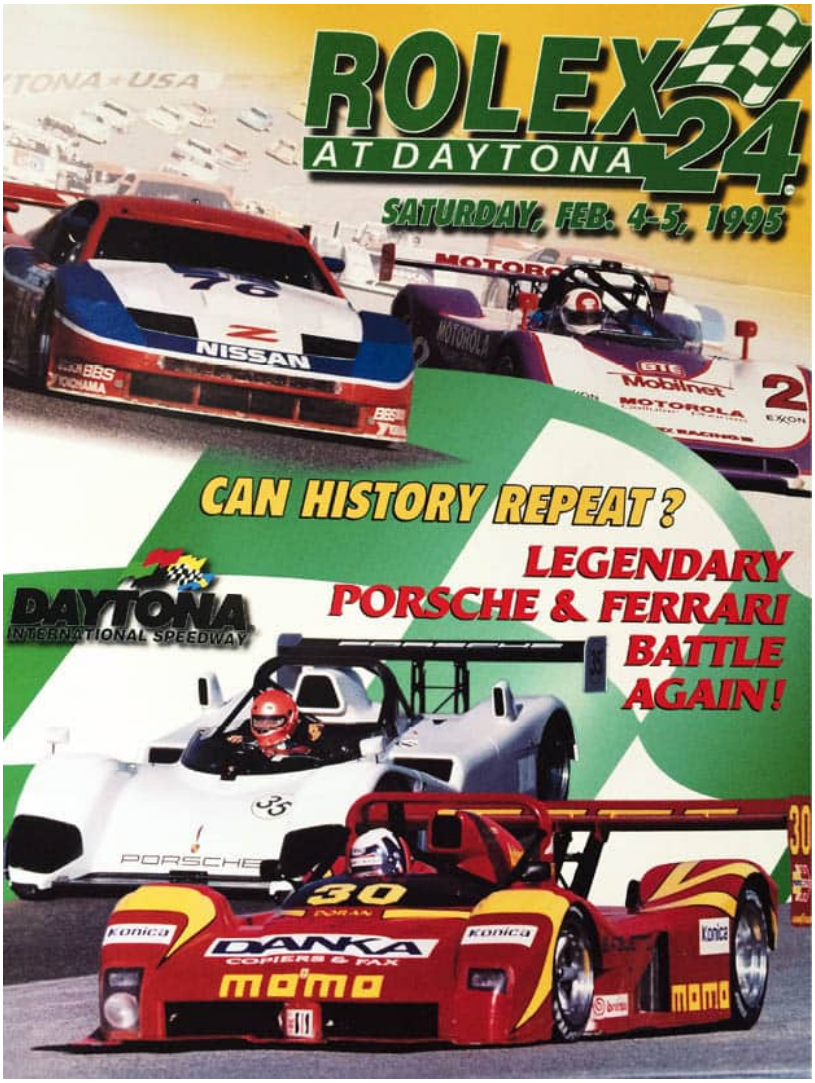
Testing at Charlotte, December 1984: it was said the aerodynamics allowed the driver, as he got to high speed on the straight, to turn the steering wheel and the car would keep a straight line! (P)

The Porsche team over in Germany under Norbert Singer, however, realised quite early that there was a problem during a visit to the USA. Norbert Singer told the author: “I went the first time and talked to the team, and they said we will make some adaptations to ensure the engine will fit. First visit okay. I went again after four weeks; they said we are making great progress. But I didn’t see anything different, though they said there was progress. I was concerned: we had a timetable and needed to do the first test in December 1994, because we wanted to run at Daytona in January. It would be entered as a Porsche factory car with Andretti and Stuck and Wollek all lined up. My concern was that there were only a few people there (in Valparaiso): one and a bit designers, maybe three or four in the workshop. So I told Tony Dowe, who was in charge, that I was coming back with at least 14 or 15 people to finish the car. Although Tony was a clever guy, and he said we could do it very

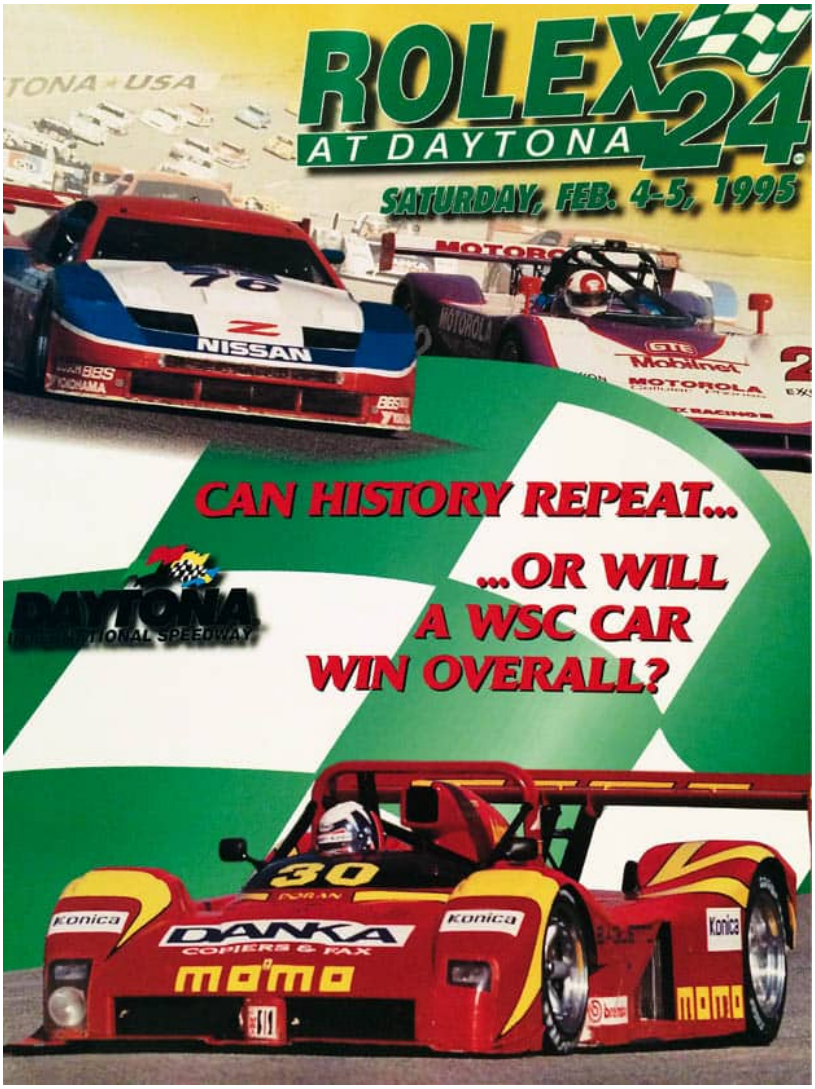
cheaply, I could see that the timescale had been badly underestimated by them. We got designers over, mechanics over – all the stuff you need to get the car ready. Well, at last, in December 1994 we had the first test at Charlotte. It was during this test that Terry Boutsen, who was doing the driving, crashed – not badly, luckily. Scott Goodyear was also driving in this test. I remember in the fast section past the pits he suddenly came on the radio. One of the guys came over and said 'Did you see that?' – I did not at first understand. So he went out again and said on the radio, 'Look what I can do with the steering wheel!' As he got to high speed on the straight he could turn the steering wheel and the car stayed on a straight line! That's why Boutsen crashed the car. Instantly I knew we must do some wind tunnel testing. Tony Dowe said: 'When we have a model we can put it in the wind tunnel, but not now; we have to go on 3-4-5 January to the official test at Daytona.'"

At Daytona, Singer says: "We were, I think, 2 or 3 seconds slower than the Ferrari 333. Ferrari said Porsche was sandbagging. I went back to Germany and we had meetings at a high level. I said we were not sandbagging – that is the car's performance. And if we get more weight or get less power because of an imposed restrictor [Author's note: IMSA wanted to restrict some of the turbo engines], we will be five seconds slower, and this didn't make sense as a Porsche factory entry. It was decided we stop the project, we don't spend anything."

Of course, all hell let loose at Daytona when it was known that the cars were being withdrawn. That year's race had been promoted as a big showdown: Porsche versus Ferrari; even the programme for the public had been printed showing a Porsche on the front.



The first edition of the programme cover just a few days before the race, now extremely rare. The author thanks Derek Meluzio for this copy.



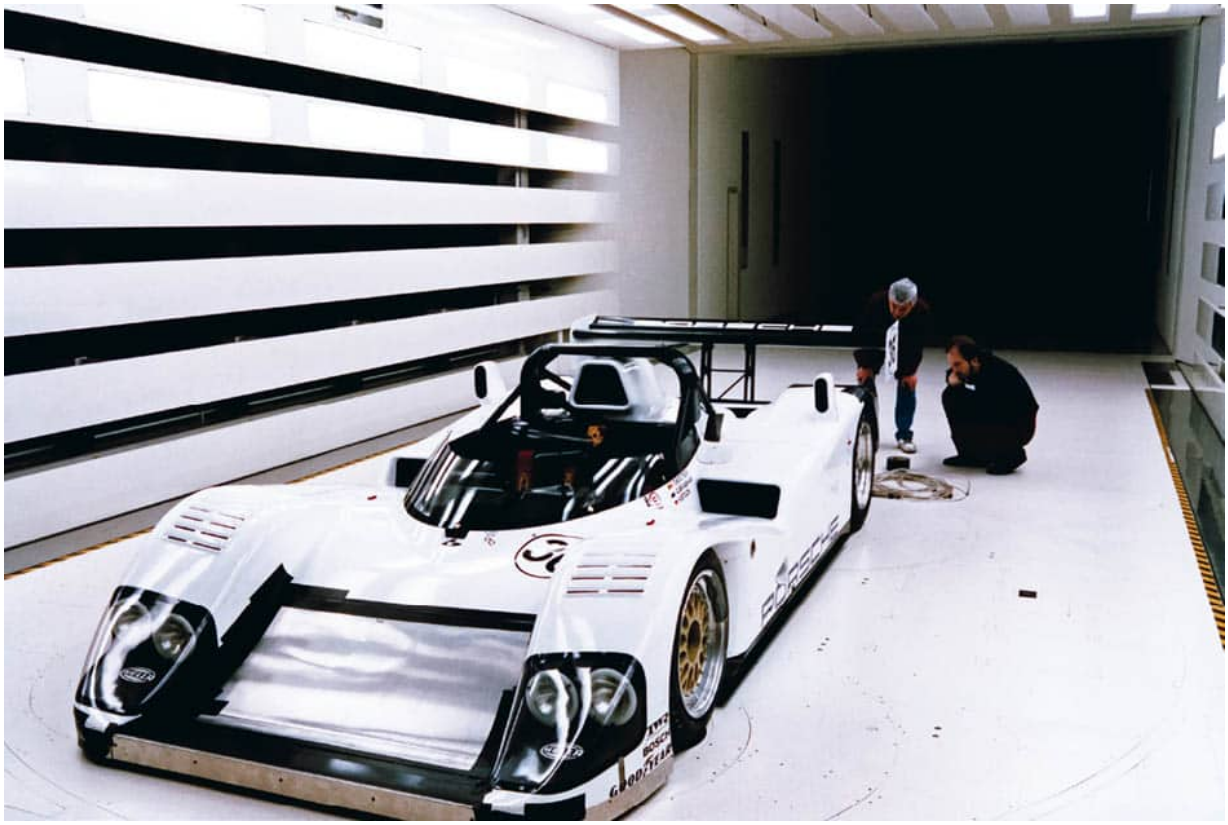
The programme had to be hastily reprinted; here we see the second edition. (DM)

Norbert Singer: “So we cancelled the project. I went over to Tony Dowe, and Tony was pretty mad. He said: ‘Look at all that we ordered from you, Porsche, that I have paid for!’ I said: ‘Wait, you had this already in stock! You just had spare parts, and that’s what Porsche are paying for. The rest is your own old Jaguar GTP project stuff that you want to sell me. No way!’ However, after three or four days we made an agreement, and the two cars along with all the spare parts came to Weissach. There they sat for several months.”

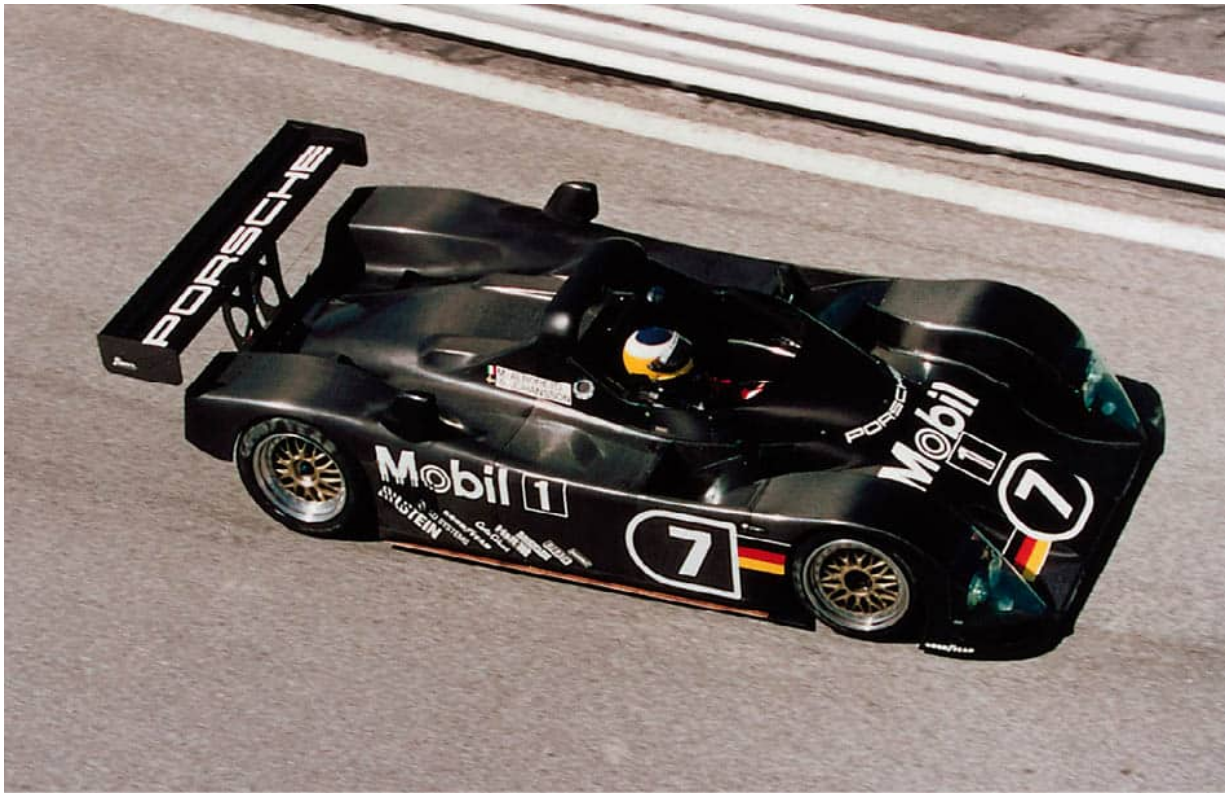
Reinhold Joest, of course, got to know the situation; he knew the cars were in Weissach and started to talk to Porsche about Le Mans

for 1996. Norbert Singer: “He said: ‘You have those prototypes here, can I borrow them? I will run them at Le Mans.’ I said: ‘I think there is quite some work to do on aerodynamics.’ We came to a financial agreement and I took the car into the wind tunnel, where we found it had lift at the front and downforce at the back! Three days later, working day and night on modifications, we went into the tunnel again; after those three days we at last found a balanced car, aerodynamically.

“Joest took the car. He was happy, and won the 1996 Le Mans. The press came up and said Joest was beating Porsche. So I said: ‘Well, we did the job. It’s my car!’” Singer continues: “Actually, we had made an interesting deal with Joest, the deal being that if he/we won Le Mans, he could keep the winning car.”



Preparation for Le Mans 1996, after a talk with Reinhold Joest led to agreement for him to run the two TWR-chassised cars. Here, the 001 chassis undergoes assessment in the Weissach wind tunnel. (P)



First test with 001 at Le Mans 1996: Manuel Reuter at the test weekend, 28 April. (P)

Pierluigi Martini testing the 002 TWR-Joest WSC 95 at Le Mans on the April test weekend. (P)

Ralf Jüttner, then technical director of the Joest team, is recorded as saying: “Reinhold Joest hankered after a return to Le Mans. He’d visited the 24 Hours (Daytona) in 1995, a year that Porsche was meant to have been present with its WSC95 prototype. The cars had been mothballed. Joest saw the potential of the cars now gathering dust.” Reinhold persuaded Porsche by saying that they didn’t know how ready Joest was going to be with its new 911 GT1, which had been announced in November 1995, nor how good it was going to be. Ralf Jüttner: “When Singer belatedly put one of the WSC95s in Porsche’s wind tunnel, the results were disastrous. That first car had something like 95% of the downforce on the rear. Maybe I’m exaggerating, and it was 85%. Anyway, it wasn’t good. We didn’t have CAD (computer-aided design) in those days, and there weren’t even many drawings. We did it the old-school way: we gave it to DPS (the composites company set up by team owner Dave Price) and

they did it for us. There was also a new cooling system, a revised fuel system and, very significantly, a major testing programme with Goodyear."

At the Le Mans test weekend both cars, 001 and 002, ran successfully but were not the fastest. That honour fell to the two Ferrari 333SPs – one a factory car, the other a Dallara-chassised example, both driven by Eric Van der Poele; he was 1st and 2nd. The Porsche WSC 95-001 was down in 10th spot, while the 002 car was in 5th. Some 66 cars were attending the test session. The engine in the TWR-Joest Porsche was still the successful 935/85, a twin turbocharged 2994cc that had seen service in a Dauer 962 Le Mans GT!

Initially, with the background stories flying around at Le Mans about the TWR-Porsche cars, few took much notice of the fact that Joest was now running them, under the wings of Porsche. They were down in 10th anyway. The Joest team returned home to prepare for the race itself. All the talk in the press was of Ferrari, the expected front runners.

Two other Porsche entries, works cars, were the new Porsche 'Werks' LM-GT1s, powered by the 962 engine. The WSC circus was still not too worried when Davy Jones/Manuel Reuter/Alexander Wurz put their No 7 car, Joest WSC 95-01, in 7th place on the grid. But the shock came to the Ferraris when first the Pescarolo Elf Courage-Porsche took 2nd on the grid with a Porsche GT1 factory car 3rd. Then came the crunch: on pole was the WSC 95-002, No 8, put there by Pierluigi Martini.

Scrutineering for the big race; no one was too bothered that the Joest cars had been 5th and 10th in April. (P)

Fastest of all in practice, only down in 10th at the test a few weeks earlier. All the talk was of Ferrari, but it was the new WSC 95 of Pierluigi Martini on pole for the 1996 Le Mans 24 Hours, its sister car being seventh fastest. (P)

Seventh fastest in qualifying: the Davy Jones/Alexander Wurz/Manuel Reuter WSC 95 001. Norbert Singer was not concerned: all the top four on the grid were Porsche powered. (P)

As the race commenced, sports car master strategists Reinhold Joest and Ralf Jüttner had a plan and the No 7 was following it. The factory 'Werks' GT1 Porsches were in the lead at the start: Ferrari lost one of its challenges early on. Singer wasn't worried about Joest – it was still a Porsche engine and car! Even though the regulations for 1996 had called for a 34mm air restrictor, and boost limited to 2 bars, the power output was still recorded as 540hp.

Everyone thought that with a smaller fuel tank these cars would have to stop more often; in fact, such was the management during the race that they found they could run a lap longer than the competition, now seen as the factory GT1 cars. Through the night the WSC-95s were witnessed running nearly two laps ahead of the competition, until, with just under 38 laps to go, the No 8 car failed when electrical gremlins struck. The No 7 car, however, was steadily pounding round, eventually to take victory a lap up on the second-placed GT1 of Wollek/Boutsen/Stuck. We return to what Ralf Jüttner

has said: “I wanted to be able to do triple stints at Le Mans. We had an 80-litre fuel tank and the GT1 had 100-litre, and I thought we could overcome that disadvantage by doing triple driving stints.

“The WSC-95 was at least as quick as the two new Porsche LM-GT1s and only went one lap less on a tank of fuel. Triple stinting saw the winning car saving time in the pits, shared by Manuel Reuter/Davy Jones/Alex Wurz. They led all but a handful of laps. Its only problem was a loose oil catch tank that required replacing.”

Fill her up! A cool night stop for the No 7 WSC-95 Davy Jones/Alexander Wurz/Manuel Reuter car. (P)

The factory GT1s would be 2nd and 3rd, giving Porsche a 1-2-3.

For 1997 and 1998 the cars would be known as WSC Joests. A lot of wind tunnel work had been carried out. Chassis 01 would again in 1997 be the No 7 car, and would be driven by Michele Alboreto/Stefan Johansson/Tom Kristensen. It had undergone several revisions, and appeared in practice.

The original, thought of as something of a no-hoper, had undergone a lot of aero development, first with Norbert Singer and his group,

then with Joest. The engine had been shown to be impeccable, and so it proved when all the hard work saw the No 7 car take pole position for the second time in two years at the 1997 Le Mans 24 Hours.

Who's laughing now? Norbert Singer had a smile as the Davy Jones/Alexander Wurz/Manuel Reuter WSC95-01 crossed the line the winner, after 24 hours at the front of affairs. A Joest-Porsche-run car, built in conjunction with TWR it may be, but it was still Porsche powered. Porsche and Joest expertise had pulled off another victory. (P)

Michele Alboreto/Stefan Johansson/Tom Kristensen: 5 May 1997 Le Mans test weekend, second fastest with Alboreto at the wheel. (P)

Michele Alboreto/Stefan Johansson/Tom Kristensen took the 1997 pole and victory – an incredible achievement for a no-hope car just three years before, now with two wins in a row. (P)

Back to Ralf Jüttner's comments: "The team had been granted a guaranteed place on the grid, courtesy of its victory the previous year, but somehow we didn't realise we had to follow the normal entry procedures. Reinhold had forgotten to apply to race. A series of frantic phone calls from Germany to France resolved the situation." A remarkable achievement in the face of fierce competition and rapid development from other teams. The works Porsche GT1 was once again pushed into 2nd place on the grid, and the Ferrari 333P into 3rd. Come the race, it was the WSC Joest that tussled for the lead with the GT1s, Courages, and McLarens, with the latter coming up from 25th and 22nd on the grid to finish 2nd and 3rd overall. Joest-Porsche ran only the one WSC in 1997. However, it was to be the car that won in 1996 that took victory. Two wins in two years: Norbert Singer was still happy – well, fairly happy – the Works team would have won with its GT1, had the car, at the time driven by Ralf

Kelleners, not had an oil line failure! As Norbert Singer told the author: “Although the Joest cars had beaten our factory cars, there was never any animosity from our side. Dr Wolfgang Porsche, Dr Wiedeking, Mr Marchart, Mr Ampferer – we all went to the Reinhold Joest team to congratulate them in 1996 and 1997. It was a fact that together we had made a great car from a rather poor one.”

For 1998 things would change: the engines would be the new 3.2-litre units with sequential gearboxes, new brakes and some sophisticated wind tunnel work overseen by Norbert Singer. Still run by Joest, the cars would be designated as Porsche LMP1/98, and would be entered by the factory. However, the competition this year would be hotter than ever. Mercedes was back; Toyota and BMW would also be there to take the fight to Porsche GT1s and the LMP1/98s.

The pre-qualifying session had the story: the TWR-LMP1/98s were struggling, with the No 7 car qualifying only in 9th. Although some sources say it was electrical problems that caused its demise, Norbert Singer told the author: “It was the flywheel: it parted company with the crankshaft.” (The car had qualified 9th on the grid.) The No 8 car lasted well into the race to lap 218. Just before this, a rain shower during the night period led to driver David Murray having a spin, and hitting the wall at the Porsche curves; he got back to the pits and the car was repaired. But a few laps later, the rear section, with the wing attached, flew off and he spun again, but this time at 300km/h. The car returned to the pits and was withdrawn. After the Le Mans 24 Hours, the final race of the LMP1-98-01 would be the 10 October 1998 Petit Le Mans, where Michele Alboreto/Stefan Johansson/Jörg Müller would qualify 3rd on the grid, and take 2nd overall at the chequered flag.

Le Mans 1998 with the updated TWRs, now LMP1s, and being run by Porsche. The race was a failure: two spins, a hit on a wall, and a rear cover lost, spelt a bad weekend at the coal face. (P)

Alboreto/Johansson/Dalmas: the flywheel parted company with the engine, causing a failure on lap 107, and putting paid to their weekend. (P)

James Weaver/Pierre-Henri Raphanel/David Murray in the LMP1-98-02 car – qualified 20th, but the car lost its bodywork in a wall-hitting spin on lap 218; it did not finish. (P)

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Cougar-Courage-Porsche – Part 2

In 1990 the World Sports Car Championship would be run, as in 1989, without the Le Mans 24 Hours on its calendar. For Yves Courage, there were some decisions to be made. He would run again in the WSPC (World Sports Prototype Championship) and at the non-championship Le Mans; after all, the circuit was virtually on his doorstep. For the WSPC, he would race first in 1990 at Suzuka in round 1 of the Championship, the Cougar-Porsche would be a C24S created as before in the Courage workshops. The C24S Cougar (chassis C05) ran in the WSPC championship, finishing 12th at Suzuka, 13th at Monza, 10th at Dijon, and 10th at the Nürburgring; regular drivers were Pascal Fabre/Lionel Robert, who were joined by Michel Trollé at Le Mans, finishing 7th overall and 7th in Class C1.

A second C24S failed to finish at Le Mans 1990 (car 12), whilst an

older C20 chassis 01 entered by Philippe Farjon (car 113) also dnf'd. For 1991, the 3.5-litre F1 engines were to be eligible in the C1 class exclusively, but there were so few ready that the FIA allowed the Category 2 class of C1 to run again for another year. The FIA yet again renamed the championship, which now became the Sports Car World Championship (SCWC)! Courage Competition would run the Cougar Porsches once more, now with the twin-turbo 3.1-litre engines. Monza would bring the first sight of the new C26S, two cars running, as in 1990, with the Nos 12 and 13. Lionel Robert continued to drive, and François Migault would accompany him. Michel Trollé would also be on the driving team. For 1991 the Cougars were 9th and 10th at Monza on 5 May. At Silverstone, car 12 was a dnf, but the 13 car with Michel Trollé/Claude Bourbonnais finished 9th.

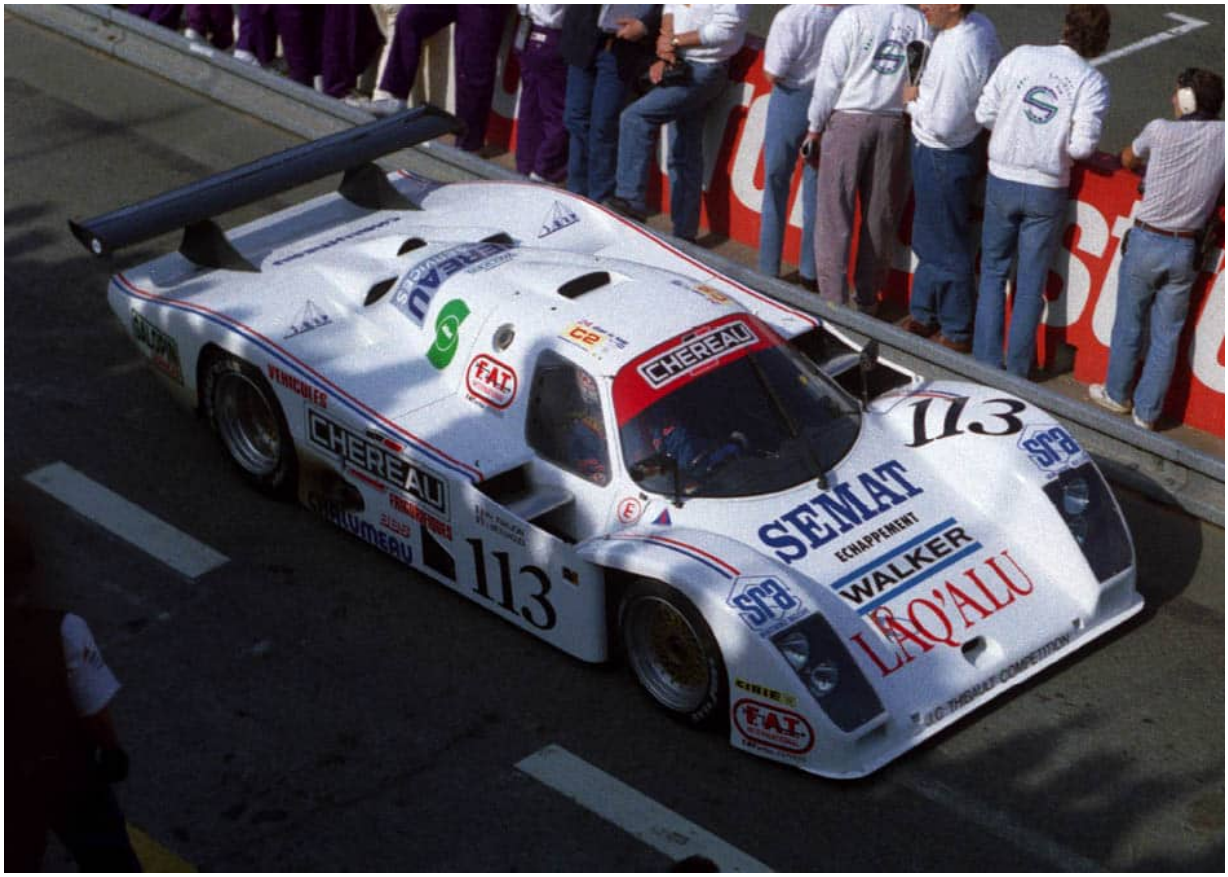
Due to the aforementioned rule changes in sports car racing, Courage was now shuffled to the C2 class (cars complying with the older rules) for Le Mans in 1991. Yves Courage had entered four cars; the C26S-007 performed best, coming home 11th overall.

Category C3 (a class for Porsche-powered cars) came into being in 1992. Courage was no longer able to run in the diminishing World Championship due to its continued usage of the Porsche turbocharged flat-six, which became no longer legal in WSC. However, at Le Mans they were eligible and in the C3-class (the Porsche class 3-litre Turbo) the Courage C28LM took the C3 class victory and finished 6th overall. This car was driven by Henri Pescarolo. Courage would only enter the Le Mans 24 Hours in 1992 (with three Cougar-Porsches). The Courage cars, though, were to be seen frequently in the Interserie Challenge races.

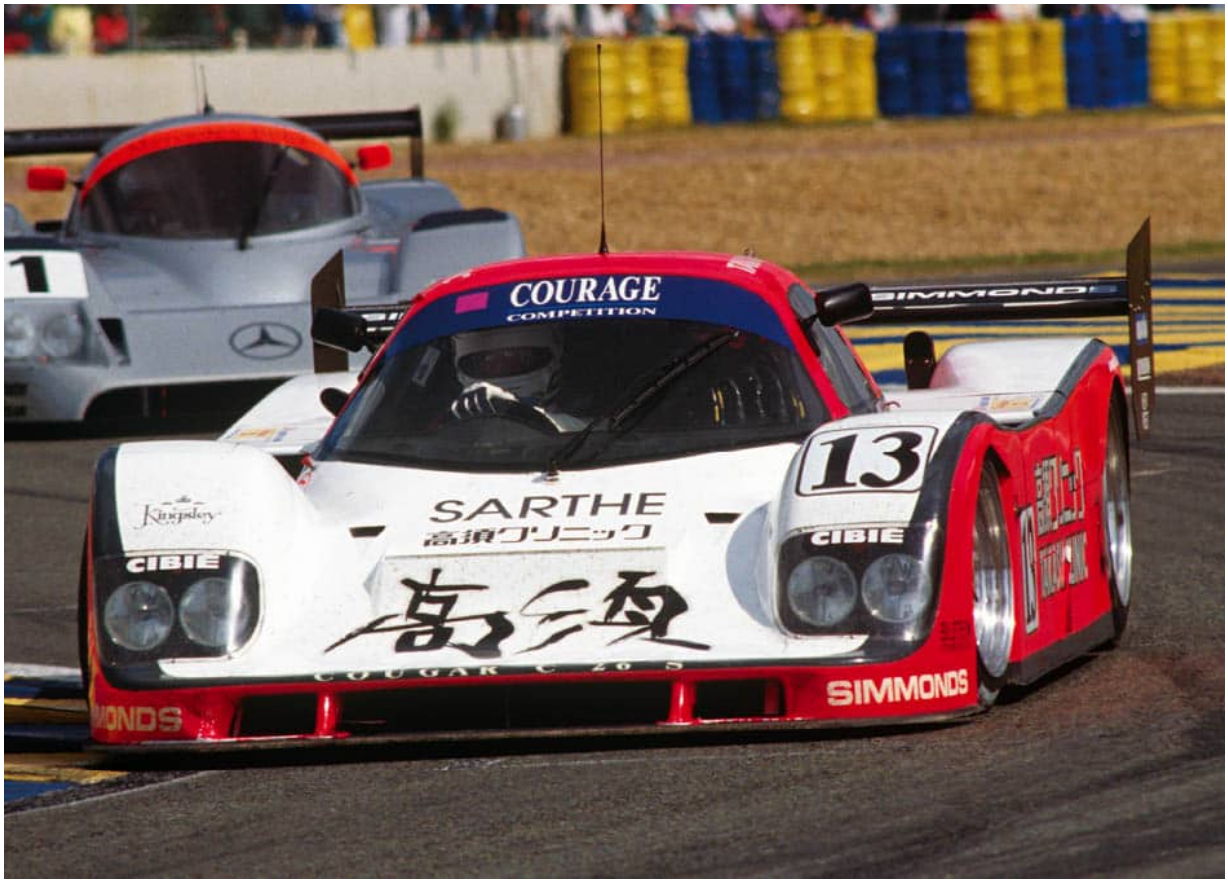
Courage would return in 1993 to the C2 class, which was still live at the ACO (Automobile Club de l'Ouest) and take both 10th and 11th-place finishes at Le Mans (5th and 6th in class), though the No 12 car dnf'd. The following year would see a 7th-place finish. This time the cars were named Courage-Porsches, it is said because the name Cougar, used up until this time, would cause conflict in the USA, there already being a Cougar car there.

The C24S No 13 Cougar (chassis C05) ran in the 1990 WSPC Championship, finishing 12th at Suzuka, 13th at Monza, 10th at Dijon, 10th at the Nürburgring; regular drivers were Pascal Fabre/Lionel Robert, seen here at Le Mans where the Group C1 car finished 7th. (AJFR)

The Cougar 24S-C03 Bernard Thuner/Alan Ianetta/Pascal Pessiot Porsche 935/83-engined car did not finish, engine failure on lap 57 causing its demise. (P)



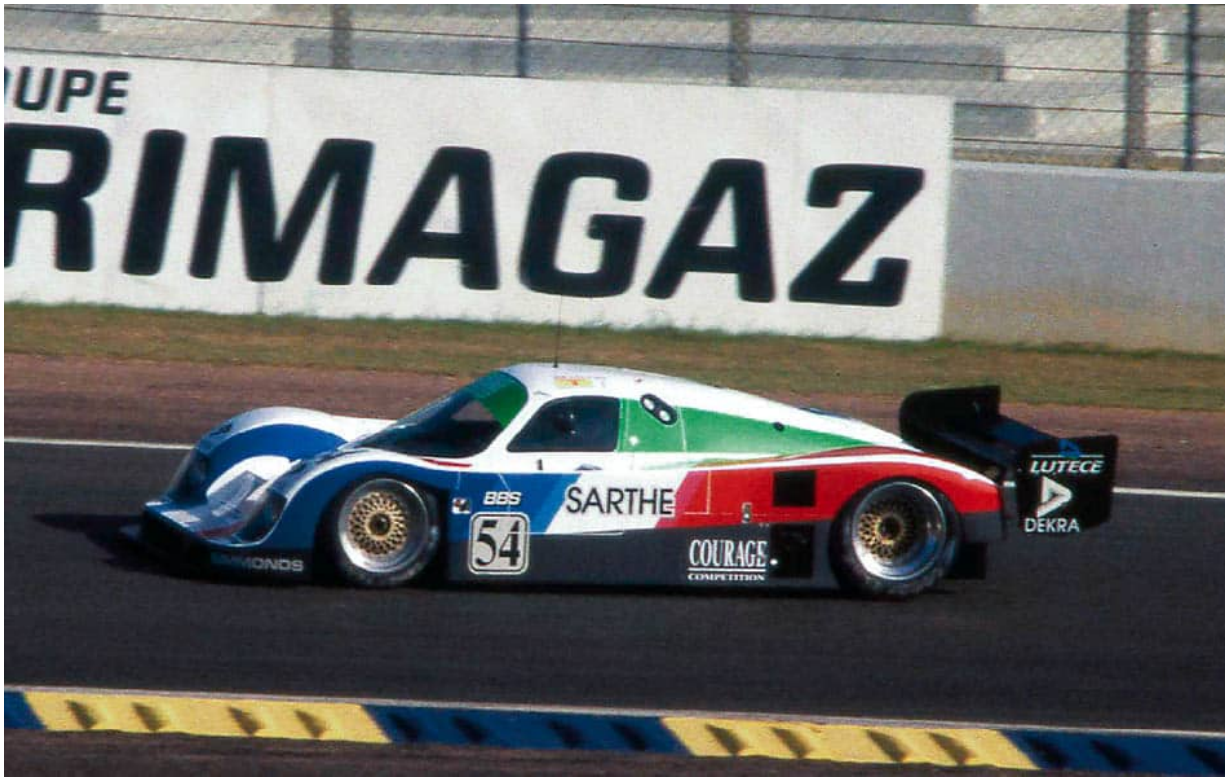
Le Mans 1990: Cougar C20B 001 with Jean Messaoudi/Philippe Farjon, qualified 42nd but dnf'd due to an accident at 19.00h on lap 43 which saw the end of their challenge. (DC)



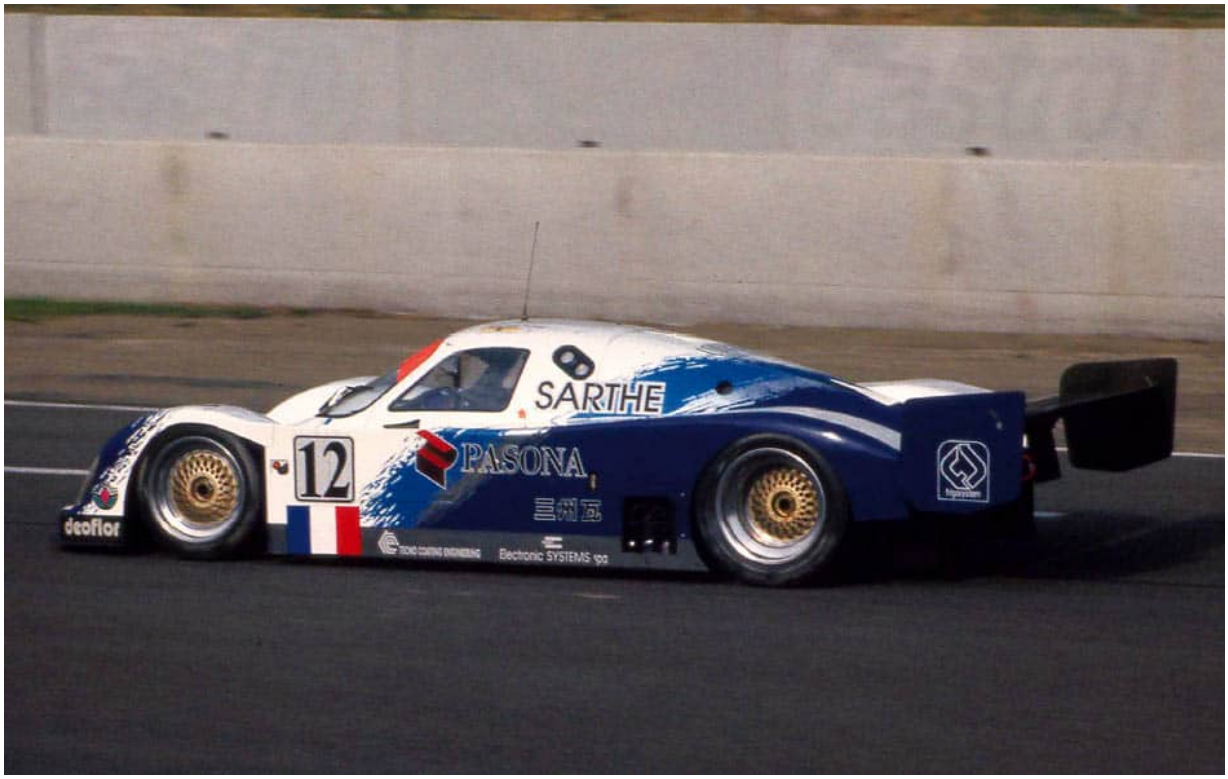
Johnny Dumfries/Anders Olofsson/Thomas Danielsson, 24th on the grid in the Cougar C26-06 at Le Mans 1991. Engine failure caused dnf on lap 45, just three hours into the race, overheating causing the failure. (P)

Le Mans 1991: the C26S-007 Cougar running in category 2 of the C1 Prototype class. The No 12 car of Lionel Robert/François Migault/Jean-Daniel Raulet finished 11th overall. The other Cougar-Porsches, though, were not so lucky. (AJFR)

C26-005 Courage not running at the finish of the 1991 Le Mans; Michel Trollé/Marco Brand/Claude Bourbonnais completed only 293 laps. (AJFR)



Another year of turmoil for the sports cars: the Cougars would only race in the1992 Le Mans, not the Championship. Car 54 would deliver. Bob Wollek/Henri Pescarolo/Jean-Louis Ricci in the Cougar-Porsche C28S-008 taking 6th overall, winning the Porsche engine only class C3. (AJFR)



Bad luck dogged the C30LM Courage-Porsche of Carlos Moran/Alessandro Gini/Tomiko Yoshikowa at the 1993 Le Mans. After qualifying 19th of the 47 starters, the car was put out of action by an accident on lap 108. (FR AJ)

The great Derek Bell accompanied Lionel Robert/Pascal Fabre to take a fine 10th overall in their Courage-Porsche at the 1993 Le Mans 24 Hours. (AJFR)

7th overall from 11th on the grid, for the Number 9 Courage C32-010 with Jean-Louis Ricci/Philippe Olczyk/Andy Evans at Le Mans, 1994. (PK)

Great promise was shown, with pole position for the Courage C32-13 of Alain Ferté/Henri Pescarolo/Frank Lagorce. Alongside it in 1994 was the controversial Dauer-Porsche. Unfortunately for Courage, the Dauer-Porsche won and the C32 dnf'd when its Porsche engine failed. (P)

The already mentioned BPR series in 1994 brought about a renaissance of the GT classes, and a new WSC World Sports Car series saw the light of day, too. A total of 38 cars started the first BPR race at Paul Ricard in 1984. Yves Courage, though, again decided that Le Mans was the place for his cars, and looking at 18-19 June 1994 we can see why. He had created the new C32 Courage. Three C32 Courage-Porches would start. One car, No 2 of Franck Lagorce/Henri Pescarolo/Alain Ferté would be on pole, though it would be the No 9 Courage-Porsche C32 of Jean Louis Ricci/Philippe Olczyk/Andy Evans, entered by Yves Courage, that would be Courage's highest-placed finisher, in 7th overall, this being the year of the Dauer Porsche victory. (See previous item on Dauer.)

Le Mans 1994, with the sister car on pole, Jean Louis Ricci/Philippe Olczyk/Andy Evans qualified 11th in the C32LM Courage-Porsche entered by Yves Courage, running the by-now regular twin-turbo 3-litre. It flew the flag well for Courage, especially after two engine failures had caused problems in practice; then the

car went off on the second lap, dropping to 43rd overall! They came back to finish 7th overall.

For 1995, the ACO changed its qualification to compete procedures, but there would be no worries for local team Courage, which was determined to give it its best shot with the Courage Porsche C34. Courage mounted its best challenge yet, with drivers Bob Wollek/Eric Hélary/Mario Andretti challenging for the lead from 3rd on the grid in the No 13 Courage C34-11. In the end, though, the team would have to settle for 2nd place overall. This was the year of McLaren F1 GTR. Though starting from 9th, it was to take victory; one lap back was the WSC Courage-Porsche C34 No 13.

In 1996, Courage took his cars, Model C41s using Chevrolet power, to the USA again. Whilst in Europe the concentration would be only on Le Mans. Courage's now legendary achievements continued, as it finished 7th and 13th overall, and 2nd and 3rd in its Porsche-powered Le Mans Prototypes (LMP1) class. One of the two teams was actually being run by Henri Pescarolo, who would begin to develop his own team in association with Courage.

Pierre-Henri Raphanel/Lionel Robert/Pascal Fabre: a 6th place on the grid sadly resulted in the same fate as the pole-sitting Courage – another dnf. (P)

1995: the arrival of the open-top WSC era. Bob Wollek/Eric Hélary/Mario Andretti challenging for the lead from 3rd on the grid in the No 13 Courage C34-11. After 24 hours it would be 2nd place overall, and 1st in the new WSC LMP1 class. (P)

Mario Andretti/Jan Lammers/Derek Warwick: 13th overall at the 1996 Le Mans 24 Hours and 3rd in LMP1 Courage-Porsche C-36-10. (PK)

The Courage C36-13 No 5 Elf/Filière entry of Henri Pescarolo/Franck Lagorce/Emmanuel Collard, 7th overall at the 1996 Le Mans 24 Hours, 2nd in LMP1 class. This was a team run by Henri Pescarolo. (P)

The ACO would run an additional race in 1996, the Coupe d'Automne, a 4-hour two-heat event and the Courages present were both C36s. Didier Cottaz/Jérôme Policand would be in the No 1 car which would finish 6th overall, taking 12th in heat 1 and winning heat 2. Henri Pescarolo/Frank Lagorce would be in the No 2 car, and whilst finishing 3rd in heat one, heat 2 was a disaster, and they dnf'd overall.

For 1997, Yves Courage again decided to stick to Le Mans, this year round three of the Endurance Triple Crown (Daytona 24 Hours, Sebring 12 Hours and Le Mans 24 Hours). If FIA GTs of various calibres ruled the roost Championship-wise, at Le Mans the WSC Prototypes were king. So it proved, with the Joest TWR Porsches repeating their 1996 victory to win again. Courage had four cars ready to run, three entered by Yves Courage and one by Henri Pescarolo – all C36 open-spec cars.

Henri Pescarolo also took the C36 to Donington Park in England on 6 July 1997, finishing 4th overall, with Emmanuel Clérico as the co-pilot, while Yves Courage himself entered for the Zolder round of the International Sports Car series in August, along with Henri Pescarolo. The Courage-Porsche C41 of Policand/Cottaz would finish 2nd, whilst the older C36 of Pescarolo/Clérico was 3rd. On 20-21 September at the Le Mans Coupe d'Automne, a four-hour race, the Cottaz/Policand Yves Courage-entered C41 took overall victory, repeating that victory on 9 November at the Jarama 2 Hours.

4th overall, Le Mans 1997: Didier Cottaz/Jérôme Policand/Marc Goossens in the Courage-Porsche C36. (AJFR)

A conference on what we should have for lunch? Or is there a problem with the car? Le Mans 1997, Courage C36. (P)

Come 1998, Courage's partnership with Porsche was over a decade old, as was the basic design of the engines that Courage was using, though of course updates had continued throughout the period with the close cooperation of Yves Courage as a customer team working closely with Jürgen Barth and the Customer Racing Services at Porsche. However Nissan was now beginning to show its prowess, and Courage's main entries would soon be seen with the Nissan engine. A C41 and a C36 would again run at the 1998 Le Mans with Porsche engines, but it was reliability that got the cars to the end in 15th and 16th places; they had been a lot slower in qualifying than many of the then-current GT1 cars, the Courages qualifying only in 25th and 27th places, 16sec slower than the pole-sitting Mercedes CLK LM.

Yves Courage would continue to create fine racing cars: the C52 with a Nissan power unit or Peugeot V6, and a C60 model with Judd V10 or Peugeot V6. Various other power plants were tried, but none had the longevity of the association with Porsche power. Oreca eventually took over the Courage team, and many of Yves' loyal workers joined the Hugues de Chaunac organisation. Having seen and

written about hundreds of cars over the years, the author takes his hat off to one of the greatest private teams. Chapeau, Mr Yves Courage!

Henri Pescarolo also took the C36 to Donington Park in England on 6 July 1997, finishing 4th overall. Emmanuel Clérico was the co-pilot, seen here. (JS)

Jérôme Policand/Didier Cottaz: 3rd overall at the Interserie round at Donington, England, 1997. (JS)

Le Mans 1998: the No 15 car of Olivier Grouillard/Franck Montagny/Henri Pescarolo, C36-013 with a Joest Porsche engine, 16th overall. (AJFR)

Henri Pescarolo would keep the Porsche-powered Courages alive into 1999, when he raced an older chassis for his newly founded team and would achieve a credible 9th-place finish. (P)

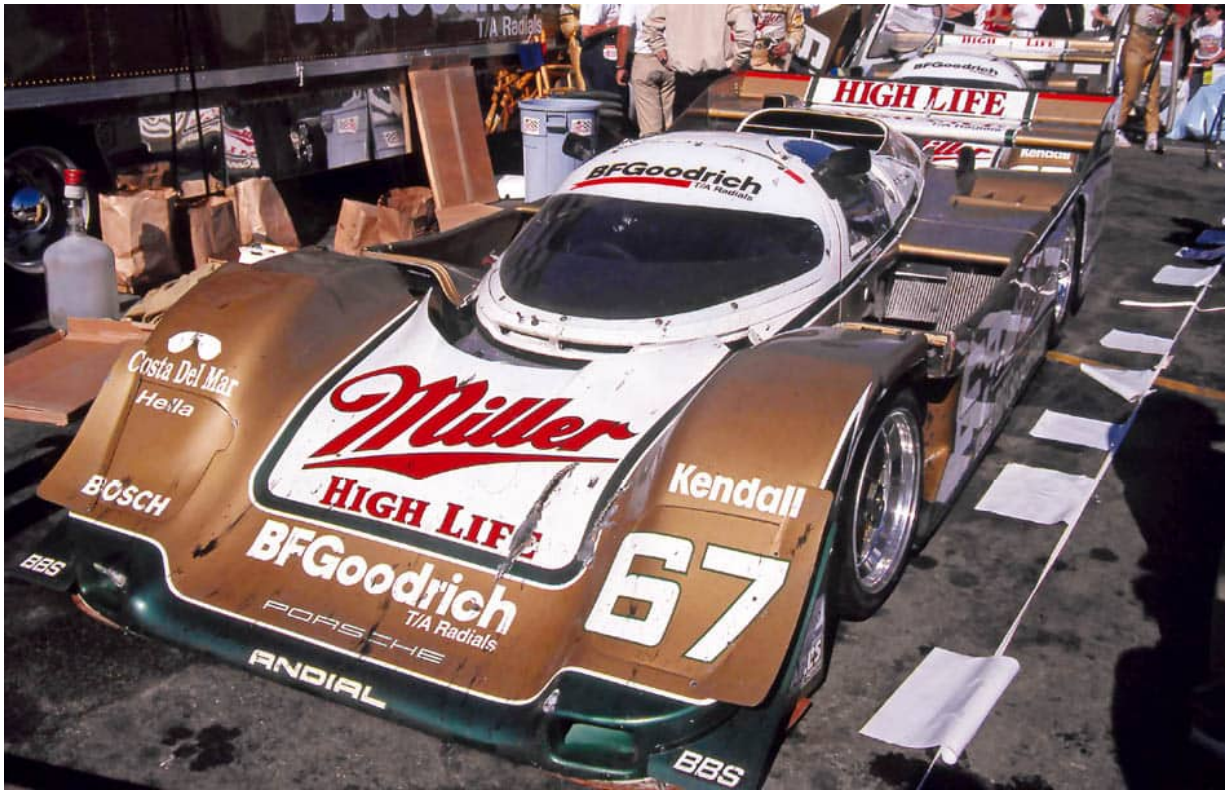
Courage Porsche-C51 at the 1999 Le Mans 24 Hours. Henri Pescarolo, at his 39th and final 24 Hours as a driver, was joined by two young guns from the Elf Fuels nursery, Michel Ferté and Patrice Gay. Entered by Pescarolo, they rose from 25th on the grid to a top-ten finish – 9th overall – a fine achievement for the Courage-Porsche swansong after a decade of Porsche power. (P)

♦ ♦ ♦ ♦ ♦

Gunnar-Porsche – Part 1

In the 1990s, Gunnar Racing, created by Kevin Jeannette, obtained a 962 and took the decision to go open-top, something we have seen quite a bit of during this period. Kevin Jeannette had a long history of involvement with Porsches, having started with a Porsche repair shop in Southern California. Gunnar Racing goes back a long way, in fact to the 1970s, when Jeannette was working as a Porsche mechanic. He created Gunnar Racing in 1978, to devote his full time to his own company. Gunnar Racing was then working with various US racing teams, running the 934 and 935s: cars such as Cliff Kearns/Milt Minter's 934, the Whittington brothers' 934 at the Indianapolis 500, and their 935s, Preston Henn, and his Swap Shop Porsche 935, including the 1983 Daytona 24 Hour-winning car, building Jeannette's business. Jeannette worked, too, with A J Foyt, Bob Wollek and Claude Ballot-Léna. As the new cars came along, so Gunnar Racing

played a part in the 962 era with Swap Shop Racing, Shelton Racing, Primus Racing, Bayside Racing and Busby Racing, along the way also repairing and restoring cars, including 917s, 908s, long-tail coupés and short-tail Spyders, 910s, and even the early RSKs and Speedsters.

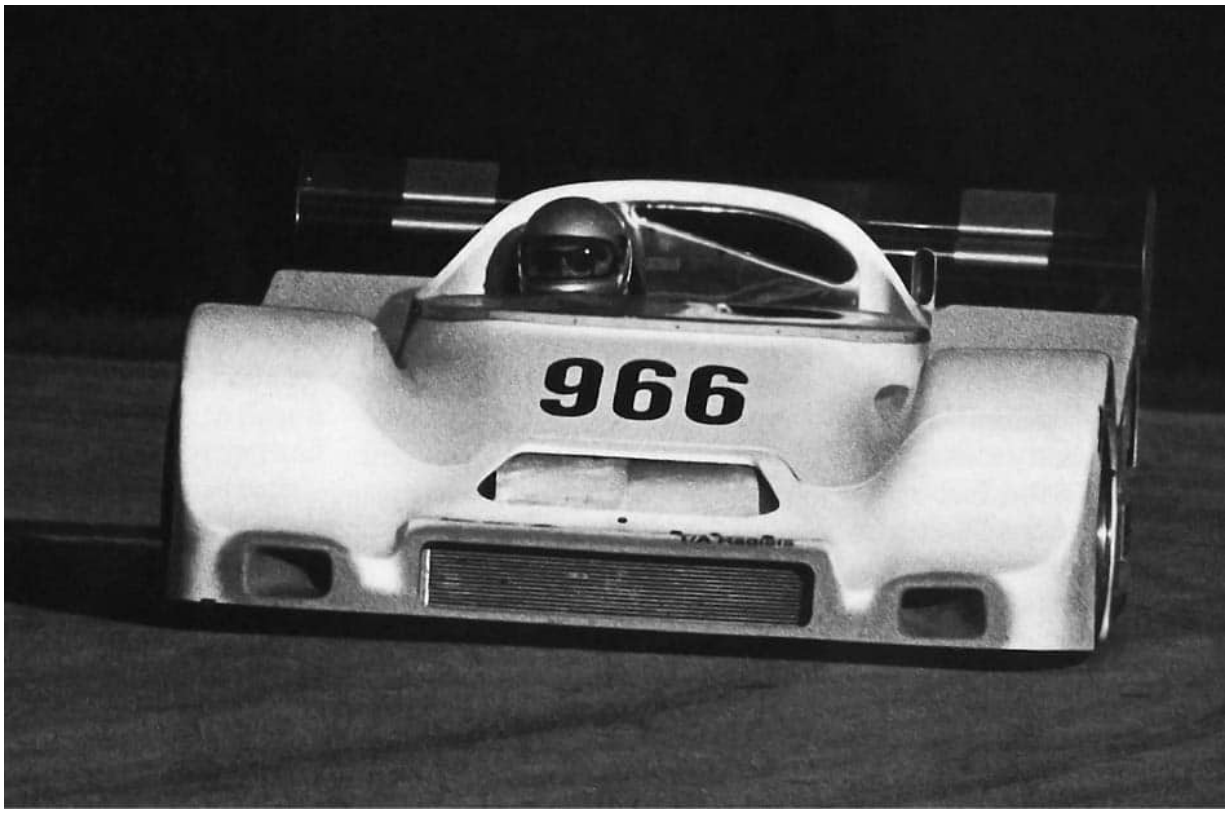


Kevin Jeannette had obtained from Jim Busby his 1989 Daytona 24 Hour-winning Miller/BF Goodrich 962, the Jim Chapman 962-108 replacement chassis 02. (MW)

The 962 Porsches had ruled the roost throughout the 1980s in IMSA, and no matter how hard IMSA tried to slow them down, through rule changes during the period, so many teams in the USA were running them, that they just kept on winning. IMSA was scratching its head as to what to do next. It reduced the displacement from 3.2-litre to 3.0-litre. That didn't work, so next came air restrictors, and all the teams did was to switch to the Group C water-cooled units used in the World Championship cars in Europe. However, the competition was catching up, and by the start of the

1990s, on the tight tracks of the IMSA Camel series, the 962s were beginning to find life difficult, as they started to lose out on acceleration out of the corners.

Porsche North America's then relatively new Motor Sports boss, Alwin Springer, who had taken over that role following the sad demise of Al Holbert in the Columbus plane crash in September 1988, was concerned that Porsche was starting to lose out. His Andial company had done all it could to up the performance of the engines, but that wasn't enough by 1991. Gunnar Racing was already on the case, as it happened. Kevin Jeannette is recorded as saying: "IMSA had long had a desire to see open-top prototypes return to the Camel series. Jeff Hayes, my business partner, and I believed we could create such a car from the 962 we had obtained from Jim Busby. It was his 1989 Daytona 24 Hour-winning Miller/BF Goodrich 962. We began talking to IMSA about doing an open-top car. IMSA, though, had a rule that said the roll cage should extend above the cockpit area." Kevin Jeannette went on to say, in 1991: "As we talked, we came to an agreement with IMSA management, which would allow us to reroute the cage so that it was contained within the body structure without sacrificing any degree of protection." Gunnar Racing had also bought all the parts from the Busby Racing Team, which Jeannette had intended to use to construct a successor to the Daytona winning car. With the agreement of IMSA, design work began on the Spyder; they gave it the Type number 966. The project got under way during the latter part of 1989, but was delayed until April 1990 due to work that Gunnar Racing were doing on the Jochen Dauer IMSA car. Jeannette said in *Porsche Panorama* magazine: "We tried to improve the downforce and the driver's visibility – things we feel are critical on temporary tracks, as well as the tighter permanent courses, such as Lime Rock and Sears Point."



First tests in the latter part of 1990: the former 962 Chapman chassis 02 now becomes the 966 Gunnar Porsche. (BO)

Derek or Justin at the wheel? The new 966 Gunnar ready for practice at the 1991 Daytona 24 Hours; it would qualify 13th on the grid. (P)

The new Gunnar Racing 966 attracted a lot of attention. (P)

At the Daytona 24 Hour test, John Paul Jr drove the car, which was then dark blue. 31 cars took part in the 3-5 January session, the Gunnar being 9th fastest. Gunnar Racing took the car along to the 1991 Daytona 24 Hours, though it seems that they had not been able to secure sponsorship. The Daytona 24 Hours was run at a time when there was a conflict in the Persian Gulf, and the minds of many in the USA were occupied with thoughts of their armed services. It is said many of the cars carried tributes. So decals were placed on the car which were signed by thousands of the many present for the race. János Wimpffen's fine work, *Time and Two Seats*, records that the car qualified 13th on the grid. In the race, won by the Reinhold Joest-entered 962 which completed 719 laps, the Gunnar 966 lasted only 83 laps before being brought in and parked up.

Gunnar Racing was back out with the new 966 at the West Palm Beach 2 Hours on 3 March, with Derek Bell/John Paul Jr as the driving team. Complications in practice meant a back-of-the-grid start, with no time, but, come the race, the car came home in 6th place. At the Road Atlanta 3 Hours, Victor Gonzalez would join John

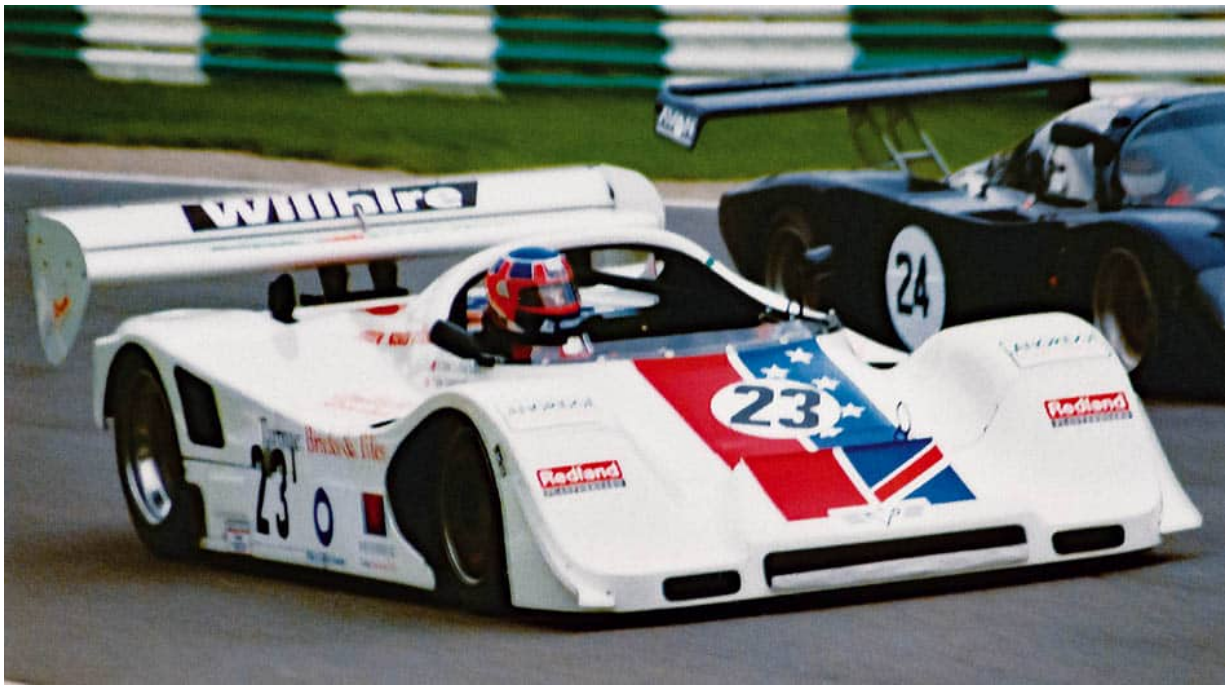
Paul Jr to qualify 11th and finish 13th. Here a new-look 966 was ready to race carrying the Norwegian Cruise Line livery.

At the Daytona 24 Hours test day at the beginning of January 1992, the Gunnar 966 turned up to run with John Paul Jr, Bobby Carradine, David Donohue and Chad McQueen, all having a run, though the car was not entered for the 24 Hours. However, it was entered for the Sebring 12 Hours by Brumos Porsche; it would carry the famous Brumos colours, and the No 59.

The 1991 Daytona 24 Hours: the Gunnar 966 lasted only 83 laps before being brought in and parked up. (P)

Interesting sponsorship for the Road Atlanta 3 Hours: Victor Gonzalez would join John Paul Jr to qualify 11th but finish 13th. (MW)

Qualifying 21st on the grid of 48 starters, the Gunnar 966 with Hurley Haywood/Bobby Carradine aboard went out on lap 45 with electrical problems. (MS)



Entered by Star Union Motorsport, John Bartlett drove Gunnar 966 to finish 9th in both heats of the Brands Hatch Interserie race on 27 July 1992. (JS)

The car was taken to the UK in July to race in the Interserie round at Brands Hatch on the 27th. It was entered by Star Union Motorsport; British driver John Bartlett drove it, finishing 9th in both heats, giving it a 9th overall final result.

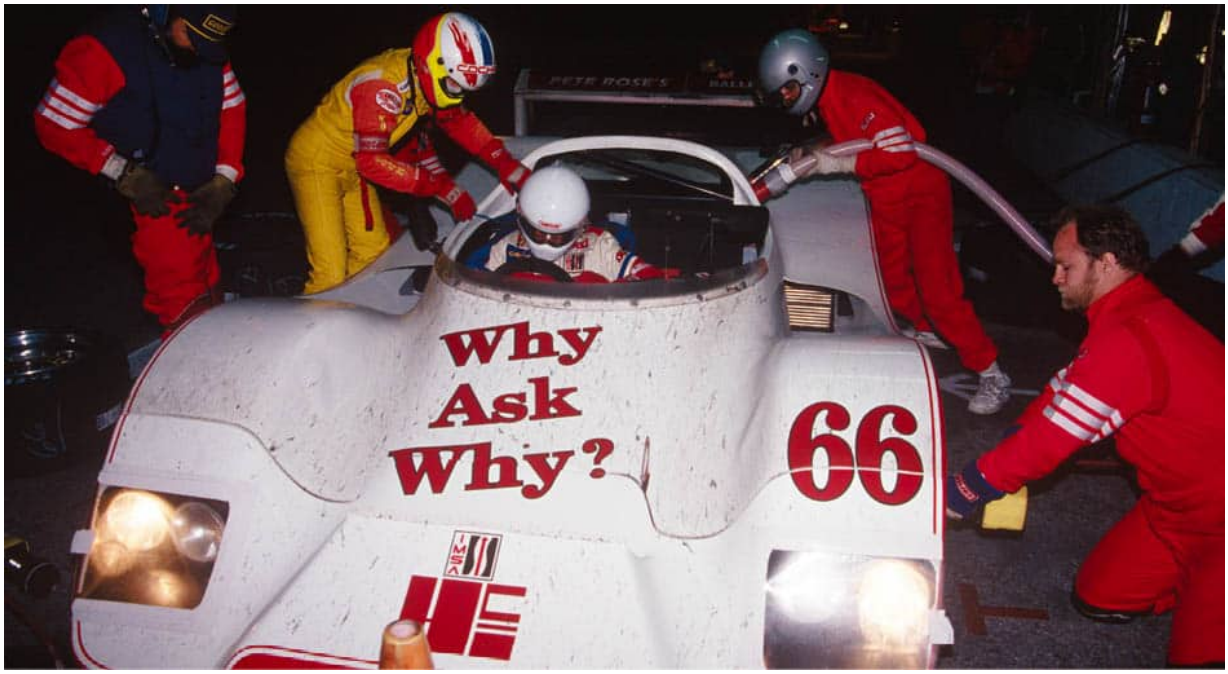
It was taken over to mainland Europe for the 9 August Zolder Interserie round where, driven by Robin Donovan, it was 12th in heat 1 and 5th in heat 2, giving a final result of 6th overall. For the 1993 Rolex Daytona 24 Hours, Dennis Aase/Carlos Moran/Chip Hanauer (apparently a hydroplane champion pilot!)/Jay Cochran/Bobby Carradine were the listed drivers. 60 cars lined up for the start; the 66 car qualified 15th, but it was a familiar Daytona story for the fated 966: an engine malady on lap 271 saw its departure from the race.

Sebring saw Chip Hanauer again join the driving team which was the same as Daytona except for Moran not being required. Practice saw them get a grid slot of 7th in a field of 47, the car returning a time of 1min 57.22sec against the pole time of 1min 46.1sec on the 3.7-mile circuit that had been set by the British driver Andy Wallace,

who was sharing the driving in the Eagle-Toyota with Juan Manuel Fangio II – they would take victory, too. Meanwhile, water expert Chip Hanauer is recorded as going off on lap 7 during one of the day's heavy showers! That was the end of the day's race, before it had really begun.

At Lime Rock John Paul had more luck, and got a 4th overall finish, the car's best result of its career. At the Road America 500km, it was again a dnf from 13th on the grid; John Paul Jr/Charles Slater were the driving crew.

Just three more races followed at Laguna Seca, Portland and Phoenix, which saw, respectively, a 7th, 8th and 17th overall finish. It is believed the car was parked up after this; today it can be seen at Vintage meetings in the USA. The qualifying places show it was no slouch, and one can see that it also attracted top drivers Derek Bell, Hurley Haywood and John Paul Jr.



A promising grid position of 15th looked good on paper, but was not translated into a good place in the race. Here at an early night-time refuel, the 966 Gunnar car would only last one-third of the distance before succumbing to an engine problem. (P)

Sebring 1993: Chip Hanauer (the hydroplane champion) joined the driving team, which was the same as Daytona except for Moran. Practice saw them get a grid slot of 7th in a field of 47, but a crash with Hanauer at the wheel in the wet race caused a dnf. (MS)

The final incarnation of the Gunnar 966, now sponsored by Sunoco. (MS)

♦ ♦ ♦ ♦ ♦

Several long-standing teams would reinvent themselves for the next decade, and recent comers become established. A new ball game would commence in the 2000s. Porsche power would be competitive with the American muscle-power engines, and, as we will see later, even Porsche V8s would be seen in the Sports Prototypes.

Chapter 7

A new era: 2000-2010

The 1990s had seen a lot of juggling for position with motorsport's ruling bodies; Porsche had been frustrated by those changes from the late 1980s. However, the BPR Championship had kept interest in Porsches alive, and the recent GT1s had performed along with the various 911 GTs, which had become the backbone of many races. Porsche, thanks to Norbert Singer and his ingenuity, bounced back in 1994 with the Dauer cars, and again with the TWR-Joest cars in 1996 and 1997, as the WSC Sports Prototypes came back in a new series. But things had gone quiet again, with Porsche not racing as a factory team until 2005 with the arrival of the 9R6 RS Spyder, an LMP2 car. This car was an all-Porsche-built operation, including the Penske-run machines, and so not a subject for study here. (Of course, Porsche did return successfully to the World Endurance Championship in 2014, though this, too, is outside the scope of this work. As far as Europe 2000-2010 was concerned, mostly the concentration was to be on the GTs, and the development of the 911 GT3 and 996 series, but as these involved car chassis which originally came from Porsche, they also do not fall within the scope of this work.)

It is to the USA that we need to turn for the period of this chapter. In the USA, the ALMS (American Le Mans Series) had been created in 1999, and would run beyond the period of our study. The ALMS was for cars that ran to similar rules to the FIA European classes. However, it was to be seen that the ALMS cars, and indeed the cars of the FIA World Championships series, were getting far too sophisticated, incurring huge cost: a place for the well-funded teams only. In the USA, they also felt that the open-top nature of the LMP cars, their speed and fragility, and their associated costs were getting out of hand. Plus, the cars were mostly built in Europe, not born in the USA. Bill France, head of the NASCAR organisation in the

US, had an idea and created the Grand-American Road Racing Association (Grand-Am) for cars built in the USA and using American engines – at least, that was the plan, certainly for the cars but also regarding the engines.

Dave Klym, founder and Chef d'Équipe of Fabcar, was approached by the newly formed Grand-Am, along with Bob Snodgrass of Brumos, who was keen for a new American series, and supported Bill France's idea. Something was wanted to replace the existing sports car class, which was more suited to the USA fans, and to be an all-American-based operation, with no interference from the FIA in Europe. The result was what would be called the Daytona Prototypes, and would form the supply of machinery for the Rolex Sports Car Series, as well as, eventually, another five other racing championships. The Grand-Am Daytona Prototypes series ran from 1999 to September 2012, when it merged with the American Le Mans Series, subsequently leaving the scene in 2016. Most of the cars would use American engines but – and here is where we come in – Porsche would play a significant part.

Dave Klym was to be a prime mover, and was the creator of the specification of the Daytona Prototype class. He was asked to help create the rules, and designed and built the first DP (Daytona Prototype) for Grand-Am in 2002, which debuted at the 2003 Daytona Rolex 24. The Fabcar chassis was configured to use multiple engines. Those using the Porsche engine started out at 3.6-litre with 475bhp at 8500rpm, with a six-speed sequential transmission, mostly made by Andial in the USA in the beginning. The Fabcar FDSC/03 chassis was the result. Over the following years, the chassis was enhanced and developed into FDSC/03-EVO. Porsche North America, through Andial, supported the work and developed a bored-out 3.8, then a 3.9-litre.

With this new project, we see Fabcar now entering its third decade of building race cars using Porsche power. Riley, Crawford and Dyson all came on the scene around the same time with Daytona Prototypes, as the class became established. However, before we get on to Fabcar in this period, we do have one European newcomer, a British car; it only appeared a few times, so it was another case of

‘if you blinked you missed it.’ However, it was a prototype and it was powered by Porsche.

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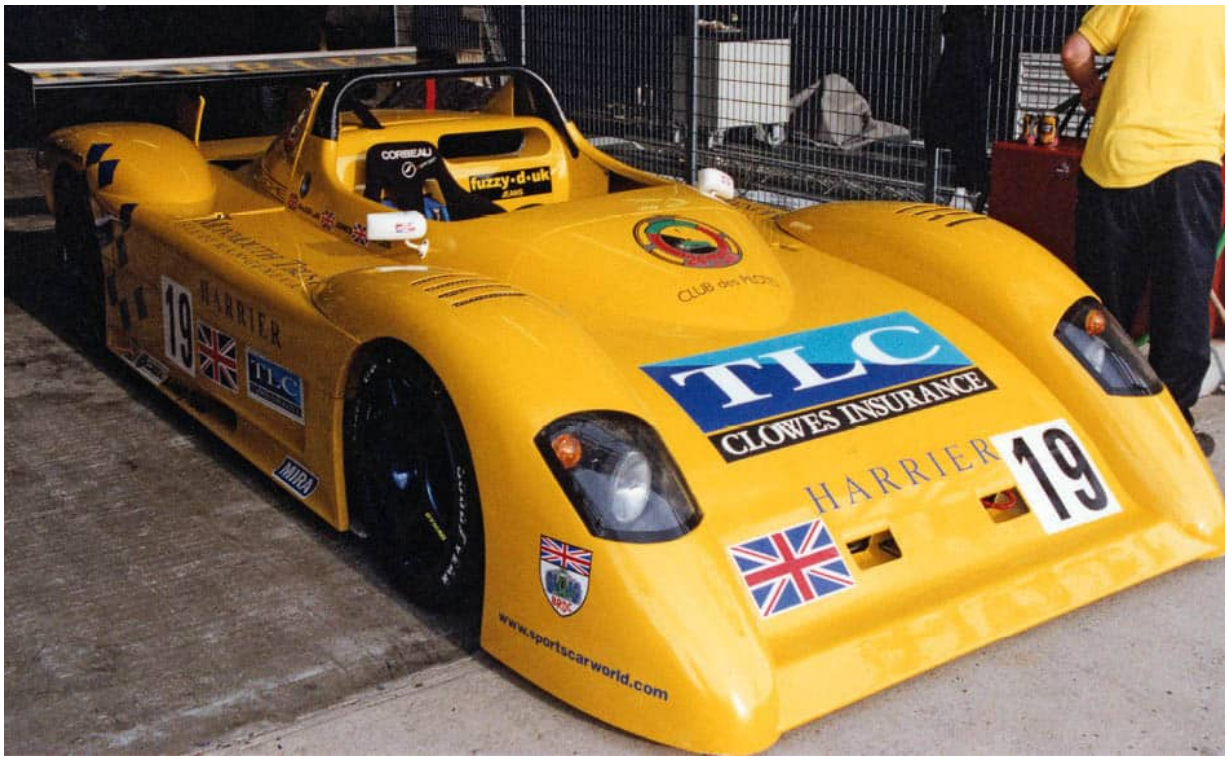
Harrier-Porsche

Harrier was a company created by one Lester Ray in 1982/3; he built the first Harrier sports-racer – a Mazda-powered example – for the FIA GTP C-junior category. Lester Ray and his sports prototypes ran regularly in the C2 class in World Championship Group C racing, and in UK Thundersports, using various engines. In 1991, stylist Dave Fidgeon joined Ray to create a road-going sports car which they called the LR9. In the UK, a GT series offered a place to utilise the LR9 on the track, where the car was entered by Team Harrier, featuring an Alfa Romeo power unit. It raced several times with little memorable recorded success. But in 1995 the Harrier started to show its potential when fitted with a turbocharged Cosworth engine. In 1997 it is recorded that the Harrier had by then achieved eight victories in the British GT Championship. Lester Ray sold the Harrier Company to Richard Austin, who had already been driving a Harrier for some time. A car listed as the Harrier LR10 appeared at the Le Mans test day 2000, following wind tunnel tests at the MIRA Research Centre the year before, when it had been hoped to tackle the 1999 Le Mans 24 Hours. However, the plug had been pulled when promised sponsorship failed to materialise. 30 April 2000, the date of that year’s Le Mans test, saw the LR10 chassis 003, powered by a Porsche engine, appear as an open Sports Prototype in the then LMP900 class. Gerard MacQuillan/Gary Ayles were down to drive it, but it seems the now Porsche-powered car never ran in anger, and was not invited to that year’s Le Mans. It is believed technical problems saw it do only a couple of laps at the Le Mans test. It was next seen at Donington in England on 27 August, where it was entered under the name of Harrier Racing for the British round of the Sports Car World cup. Ben Collins/Michael Vergers/Richard Jones were down to drive. The car qualified 12th, but did not finish the race. Its next appearance, at the Magny-Cours (France) round of the

aforementioned Championship on 1 October, was another disaster, when, having qualified way down in 26th, an engine fire put paid to any race running. The car was not seen again on the circuit. It did show up in an auction some years later, engineless but offered with a 3.8-litre turbocharged Porsche unit in a box to go with it, where it was sold with a stock of spare parts. A nice-looking car that needed proper development – another one that got away, perhaps.



30 April 2000, Le Mans test day, saw the LR10 chassis 003 appear with a 3.8-litre turbo Porsche engine as an open Sports Prototype in the then LMP900 class. Entered to be driven by Gerard MacQuillan/Gary Ayles, it ran only briefly and was not invited to race at Le Mans. (JS)

Fabcar-Porsche – Part 3

In 2002, Dave Klym was, as mentioned, given a rough guideline and asked to come up with a car concept for a new class of racing in the USA: Daytona Prototype. It seems that the rules for the design of the car were created as they went along! Dave Klym says: “That car was like giving birth to a porcupine. The Grand-Am had decided they

wanted a coupé, to replace the open-top cars that had run in previous WSC championships, and were now so fast as to be classed as dangerous, especially at Daytona."

Grand-Am specified that the car for the new series could not be carbon composite, due to the cost. It should be a tube-frame with a part-honeycomb monocoque attached. Carbon composite was only allowed for the bodywork. Dave Klym: "The cars had to be capable of taking a number of engines, too. (Toyota, BMW, Lexus and Porsche were tested in the early cars.) Crawford Composites created the early bodywork. Work began, and an idea was presented to Mr France for approval. It was accepted, the concept approved and ordered. Bob Snodgrass (Brumos) would have the first car."

As stated, the rules were written as Fabcar was building the car. Officials from Grand-Am would fly up to watch progress and measure, poke and prod. New safety requirements altered the final looks of the final Daytona Prototypes. After much testing, the near-final spec that was to be seen in 2003 was ready to race.

A jig was set up on a flat plate and the first ideas started to come together. Here we see one of the Brumos cars. (DK)

Bob Snodgrass (Brumos), who had placed an order for two cars, paid up-front; this had allowed Fabcar to move further forward with the construction of more cars. Fabcar ended up building eight DP cars. The first year of the new Formula, 2003, the Fabcar Daytona Prototype would win five races. Brumos Racing had David Donohue, Darren Law, Hurley Haywood and JC France driving. Having started way back in the 1960s, Brumos had grown to be a dominant influence on racing in the USA, and now continued to campaign Porsches and have a greater involvement with Fabcar. The Brumos team's Bob Snodgrass had taken over from Deborah Gregg, whom he had helped to continue the Brumos ideal following the death of her husband, founder of Brumos Racing Peter Gregg. Michael Colucci was the crew chief in 2003. However, we will see that Brumos cars started to struggle with the Fabcar Porsches after the 2004 season and those early successes, despite enhancements to the chassis by Dave Klym, and especially to the engine by Porsche. Brumos would

switch to the Riley chassis in the years to come.

Grand-Am also tweaked the regulations for the first race of 2003, the Daytona 24 Hours.

Among the mass of GTs in the first race of the new period were six Daytona Prototypes: two Brumos Fabcars; a third Fabcar with a Toyota engine; Doran had a DP car called the JE4, Chevrolet-powered; a Picchio BMW; and a multimatic Ford. Designated the FDSC/03, the Fabcar-Porsche, with Scott Goodyear/Scott Sharp/Hurley Haywood/Jim France driving, finished 5th overall and 2nd in the Daytona Prototype class, having started from P3 on the grid.

On 1 March 2003 at the Homestead 250 Miles, in the Grand-Am Rolex Sports Car series, 16 cars lined up for the 105-lap race. The No 59 car, chassis 1, would take victory with Hurley Haywood/Jim France at the wheel, Haywood experiencing his third decade of race winners.

On 3 May at the Phoenix 250 Miles, the race entry showed 37 starters, but by lap 22, 14 cars had been sidelined in the 151-lap race. The Brumos pairing claimed another victory.

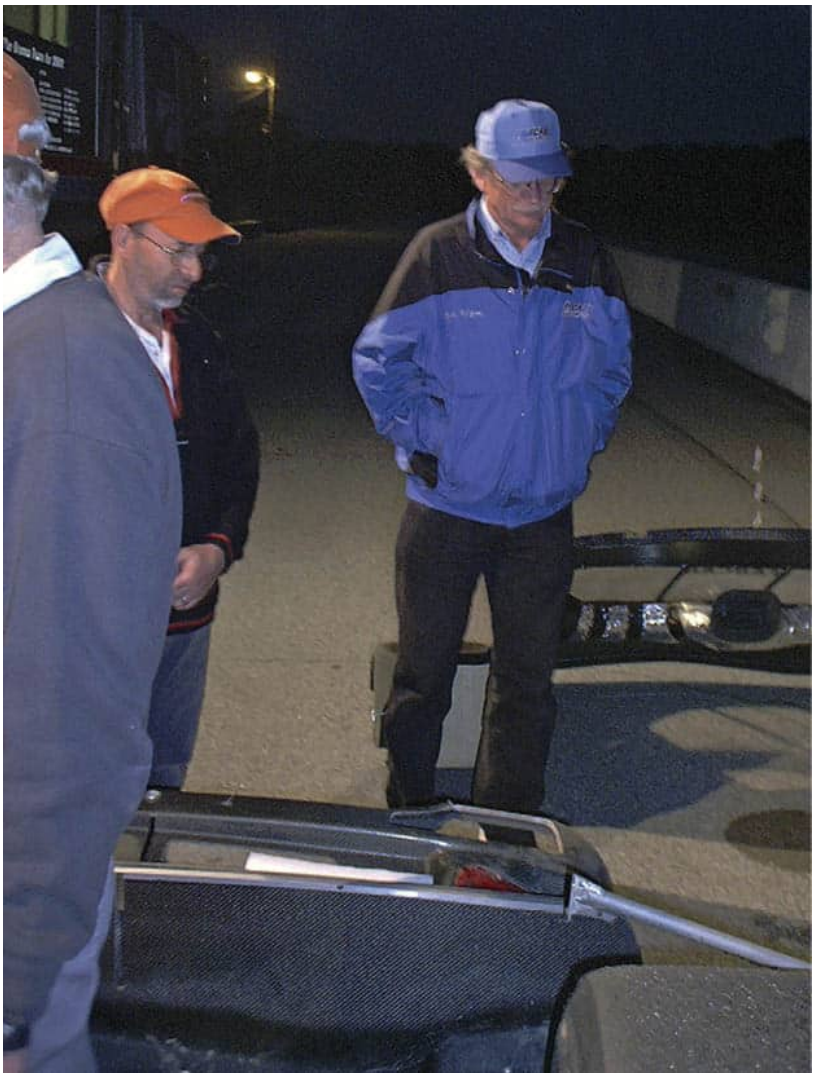
Early tests: 001 at Putnam Park. No paint – fresh out of its box. Now called a Daytona Prototype, Porsche-powered. (DK)

At the Barber 250 Miles on 18 May 2003, the No 58 car took pole position, with No 59 3rd on the grid. Here the Doran Chevrolet (54) took victory, while the 59 was 2nd overall, and the 58 was 7th. At the Watkins Glen Sahlen's 6 Hours, Scott Goodyear/David Donahue/Mike Borkowski started from 2nd on the grid and took the No 58 car's victory number one. The No 59 car got tangled in an accident so dnf'd.

The rest of the year's results were:

Car	Event	Drivers	Grid	Result
58	Mid-Ohio 400km	Donohue/Borkowski	P2	Winner
59		France/Haywood	P4	4th ov
58	Mont-Tremblant 6 Hours	Donohue/Borkowski/ Maassen	P1	Winner
59		Haywood/France/Papis	P2	2nd ov
58	Virginia 400km	Borkowski/Donohue	P2	dnf accident
59		France/Haywood	P7	2nd ov

Testing the first Daytona Prototype. Note the nod to the Brumos connection with the numbers on the front. (DK)



Dave Klym (blue top) surveys the removed engine cover of the FDSC version chassis 01, deep in thought as the night wears on during testing. (DK)

Two more Fabcars cars were built during 2003, one would go to Brumos (chassis 006; Porsche-powered) and the other to Heritage Motor Sports (chassis 005). For the 2004 Daytona 24 Hours, the Brumos 02 chassis would go from Brumos to Gunnar Racing for Gunnar Jeannette/Mike Brockman/Paul Newman/Kyle Petty to drive. Other Daytona Prototypes also would begin to show their metal: the Doran-Pontiac JE4 took the victory. Doran also had a Lexus-powered version in the race which finished 4th. Riley, of which we will read shortly, had also come on the scene, as would Crawford in the form

of Howard Boss Motorsports and Spirit of Daytona Racing entries. Again, we will see more of Crawford Composites shortly. Bill France, doyen of NASCAR, had built the Daytona International Speedway; now his son Jim was not only driving but running the Rolex Grand-Am show too.

The Daytona 24 Hours of 2004 turned out to be one of the wettest: for 18 of those 24 hours it was wet, wet, wet, leading to a red flag on the Sunday morning. Dry at the start, come the finish many cars looked like they had been in a shot blasting machine due to the battering from the rain and surface debris. A restart took place at 10.30h on the Sunday, some three hours after the race had been red flagged. Even the sun came out. The race was won, as we have seen, by the Doran JE4 Daytona Prototype, though it was a poor showing for the Porsche-powered DPs. The remainder of 2004 did not see any Fabcar Daytona coupé Porsches on the top spot, unlike in 2003.

Advanced testing at Daytona in 2003: ready to rock and roll – the new Fabcar coupé Sports Prototype chassis 2, powered by the Porsche 3.6-litre GT3 RS engine, running in anger. (DK)

Dave Klym (left) talks with Bob Snodgrass of Brumos, Daytona 2003. (DK)

Daytona, chassis 01 Brumos Racing No 59 with Scott Goodyear/Scott Sharp/Hurley Haywood/JC France driving, at the 2003 Rolex 24 Hours; the Fabcar Daytona coupé finished 5th overall from P3 on the grid. (DK)

The second Brumos car (third DP Fabcar to be built) carried Red Bull sponsorship at the 2003 Daytona 24 Hours. It qualified 2nd on the grid, but unfortunately the David Donohue/Mike Borkowski/Randy Pobst/Chris Bye car had engine problems and dnf'd on lap 160. (MS)

Daytona 2004: 14th on the grid, but dnf due to engine failure on lap 185. Gunnar Jeannette/Mike Brockman/Paul Newman/Kyle Petty. (P)

The 2004 chassis 006 became the 58 entry. Unfortunately, at Daytona it was a dnf. (DK)

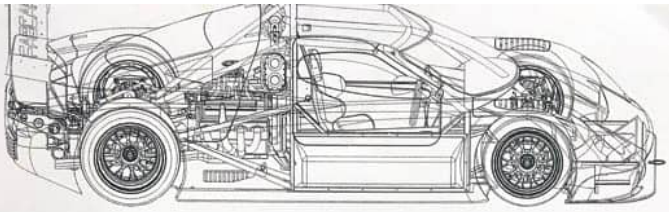
In 2005 at Daytona, another Fabcar Daytona coupé came under the Brumos wing. This was the FRAM-sponsored family car of Josh, Jake and Tim Vargo and Brady Refenning.

The Fabcar-built Daytona coupés continued to race through 2006 with Porsche, Toyota and BMW engines. As stated, in total eight chassis were produced. At the same time, Fabcar was also becoming involved in other projects not connected with Porsche.

As we reach 2007, we see the last of the Fabcar Daytona coupés, 008, acquired by Cheever Racing for Christian Fittipaldi/Harrison Brix/Antonio Garcia to drive. They would finish in 32nd overall out of the 69 starters. In 2007, Daytona Prototypes took the first ten places at the Rolex 24 Hours; such was the progress of this Formula now. However, the first six were Rileys, which had overtaken the Fabcar impetus. Dave Klym was thinking to make some changes, and he wanted to move on to other projects now that the Daytona Prototypes were well established. He made a deal with Eddie

Cheever Racing. Meanwhile VICI racing had acquired the former Southard Motorsports Fabcar FDSC/3-007 that had passed to Brumos in 2006, running as the No 58 Red Bull car through 2006.

Josh, Jake and Tim Vargo, together with Brady Refenning, drove their FRAM-sponsored, Brumos-mentored Fabcar FDSC/03 Daytona coupé at the 2005 Daytona Rolex 24. Unfortunately, they suffered engine failure after 463 laps. (P)



FABCAR FDSC/03

Toyota Powered Daytona Prototype
Technical Specifications

Engine: Grand Am Approved
TRD V-8— 4.3 Litre
90.03 Bore 84.2 Stroke
Max RPM: 8200
Compression Ratio 11:1
Valve Lift: .470 inch at the valve
Induction: 4 barrel butterfly throttle body with 1.875 inch diameter throttle bores
ECU: MOTEC M-8 to TRD specs
Lubrication: Dry Sump with Heat Exchanger
Exhaust System: FABCAR fabricated to TRD specs.
Cooling: Front mounted C&R radiator

Drive Train:
Transmission: EMCO GA 46-P 6 speed sequential
Gear Shift: Cable operated
Flywheel: Tilton/TRD
Clutch: Tilton 5-1/4 diameter 4 plate metallic
Throw Out Bearing: Tilton annular
Differential: EMCO limited slip
Bell Housing: Aluminum fabricated

Bodywork:
Carbon composite fabricated for FABCAR by Crawford Composites
Nose, nose wing, center section, two side pods
Engine deck lid, rear bumper, two doors
Under Tray: 4 piece carbon composite with replaceable Jabrock skid plates in nose

Rear Wing: Carbon composite Grand Am spec wing fabricated by Crawford Composites, with removable wicker bill. Liebeck air foil section LA104E

Windows: Lexan 3/16" windscreen, 1/8" side and rear windows fabricated by Shields® company with Supercoat™
Headlamps: Toyota Celica with Hella lights
Tail Lights: Celica
Mirrors: Cockpit adjustable

Chassis:
Mild steel tube frame to Grand Am specs with aluminum and aluminum honeycomb stressed panels bonded and riveted to tube structure.
Integrated roll cage fabricated from 1-3/4 x .090 wall DOM tubing
Removable aluminum honeycomb radiator/nose mount

Safety:
6 Point seat belt/harness
Collapsible steering column
2—10# fire extinguishers
2—Grand Am spec carbon composite side pods by Crawford Composites

Fuel System:
24 gallon custom ATL fuel cell built to F/A spec FT-3 with internal sump and 4 internal pumps
2 Bosch external pumps with pre-filters and 928 pressure filter
Jacking: 3 AP air jacks

Suspension:
Steering: Custom Woodward power steering rack with Toyota electric pump

These specs are subject to change without notice.

Front Suspension: FABCAR designed and fabricated unequal length double wishbone with pushrod actuated springs/shocks, Grand-Am spec Riley and Scott spindles and center lock nuts
Rear Suspension: FABCAR designed and fabricated unequal length double wishbone with pushrod actuat springs/shocks. Grand Am spec Riley and Scott spindles and center lock nuts. Grand Am required Pankl driveshafts and tripod joints fabricated to FABCAR specs
Anti Roll Bars: Cockpit adjustable front, crew adjustable rear
Shock Absorbers: 3 way adjustable, customer can select brand

Brake System:
Pedal Assembly: Dual master cylinder w cockpit adjustable bias bar
Calipers: Brembo 6 piston front and 4 piston rear
Rotors: Performance friction 355 mm
Pads: Performance Friction
Tires: Goodyear front 25.5x11..5-18 Rear 28x12-18
Wheels: 3 piece BBS or Fikse, 11.5x18 front, 12.5x18 rear

Electronics:
Engine: MOTEC M-8
Data: MOTEC display with integrated data recording
Lap Timing: Lap Trigger with Lap Recording in Display
Battery: 12v 50 Ah Battery
Alternator: 110 amp

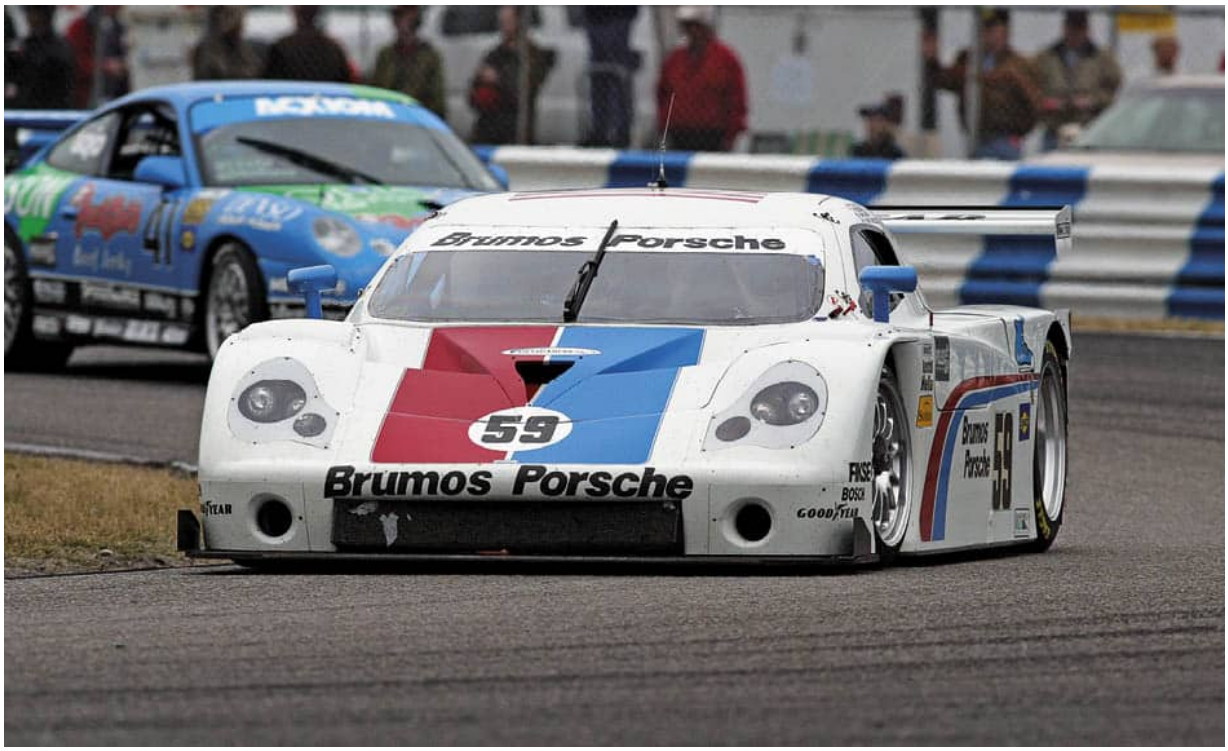
Dimensions:
Wheelbase: 110" Overall Width: 78.5"
Overall Length: 180.0" Height: 42"
Weight: 2125 pounds minimum

FABCAR ENGINEERING

4148 West 99th Street • Carmel, Indiana 46032 USA
317/872-3664 • FAX 317/872-3835 • Mobile 317/694-7940 • Email: DKlym@aol.com • www.FABCAR-USA.com

The Fabcar Daytona Prototype spec sheet: this one is for a Toyota-engined car, but the spec of the chassis is the same. (DM)

Still going strong four years after the first construction: the Fabcar Daytona Prototype had set the standard in the beginning. (MW)



2006 Daytona 24 Hours: Haywood/Christopher/Barbosa/France qualified 10th on the grid of 66 cars, but an accident intervened, and on lap 559, at just over two-thirds distance, it was a dnf. (P)

Soaking wet – the Red Bull Brumos team's Fabcar Daytona coupé chassis 007: Darren Law/David Donohue at Mid-Ohio, 24 June 2006, 8th overall from 10th on the grid. (MW)

Former Fabcar historian Derek Meluzio says: "It was originally the PAP-Parts BMW-powered Fabcar, and was then converted to FDSC/EVO-1 and tested for the first time in November. It was entered at the 2005 Hoosier Tire Test Days for first official track time as Brumos No 58. It first appeared in primer grey/white with Red Bull logos, running at the late-2006 Daytona Test Days. In the January, it was 3rd fastest after the three days of testing ended."

At the Mid-Ohio 400km, the Cheever team put their car on the front row, Christian Fittipaldi/Harrison Brix eventually finishing 8th, thus proving there was plenty of life left in the Fabcar cars.

Watkins Glen: the Fabcar Prototype licence is soon to change ownership to Cheever Racing. (MW)

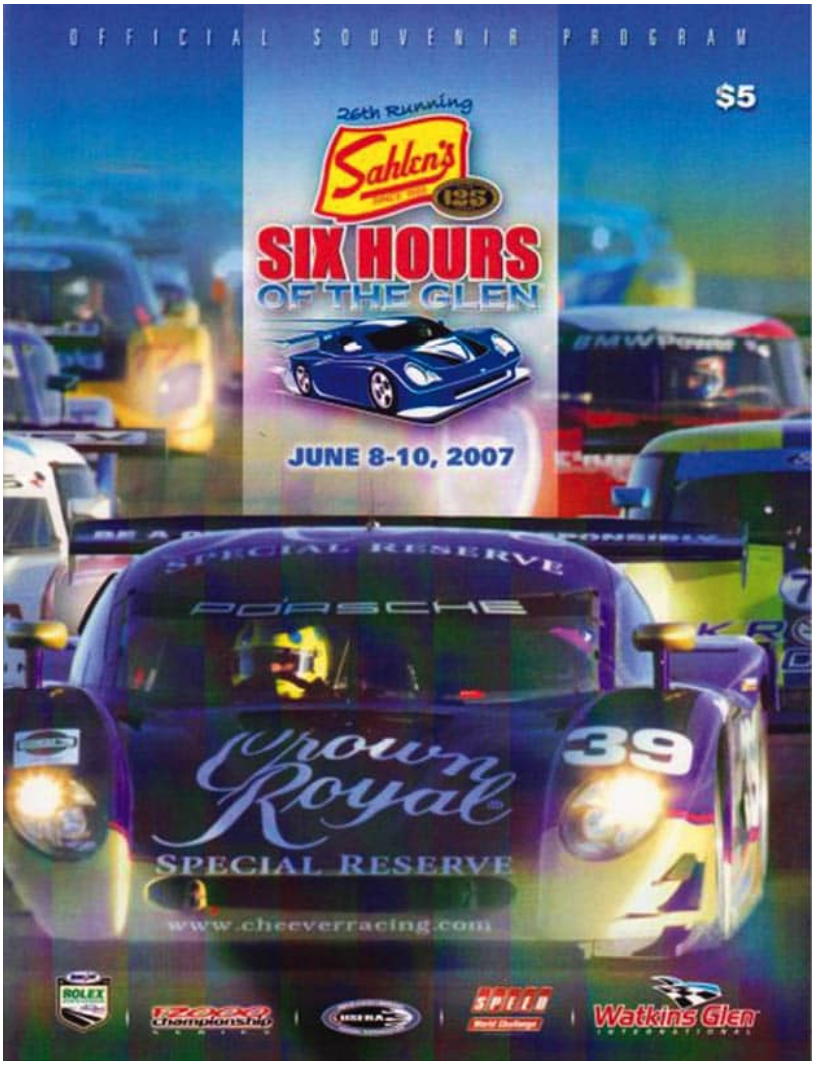
2007 Rolex 24 Hours at Daytona: Eddie Cheever Jr, now running the Fabcar FDSC-03 entry No 51 under the name of Cheever Racing. It was driven by Mike Newton/Tommy Erdos/Harrison Brix/Eddie Cheever Jr. Cheever was also running a Riley-Porsche at the 24 Hours. (DM)

Fabcar Daytona coupés:
01 – Porsche-powered – went to Brumos.
02 – Porsche-powered – went to Brumos then to Gunnar Racing.
03 – No engine – this was a mock-up version.
04 – Toyota-powered, then Pontiac – went to Cegwa Sport.
05 – Originally Toyota-powered, became Porsche-powered, used as a Brumos back-up car. Interestingly, this car ran with a 3.9-litre Andial flat-six at the Homestead 2005 round, taking pole.
06 – Porsche-powered – went to Brumos Red Bull.
07 – BMW-powered – went to Southard Motorsports.
08 – Porsche-powered – went to Cheever Racing (this was a final

advanced car developed between Dave Klym and Eddie Cheever).

The Porsche engines in the Fabcar Daytona Prototypes, all Andial Porsches, started out listed at 3.6-litre, 475bhp at 8500rpm with six-speed sequential transmission. Over the years, looking for more cubic inches, the engine was developed to 3.8 then 3.9-litre. For the 2008 season and with Dave Klym beginning to think about the times ahead, with the blessing of Grand-Am, he sold the constructor's licence to Eddie Cheever, and the chassis changed in name from Fabcar FDSC to Coyote CC/08. It is worth stating that the Fabcar Company is still alive and well today, as is its founding father, Dave Klym.

The VICI Racing Fabcar FDSC/3 chassis 007 for Uwe Alzen/Robert Renauer/Terry Borcheller/Gastón Mazzacane at the Daytona 24 Hours 2007. 20th on the grid, they would be involved in an accident and incur a dnf. (DM)



The Sahlen's Six Hours of the Glen programme, featuring the Crown Royal Daytona Prototype on the cover. (JS)

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Cheever Racing Coyote-Porsche

Cheever Racing was first created in 1996 by Eddie Cheever to race in the Indy Racing League series. The team won the 1998 Indianapolis 500 with Cheever driving. This attracted more sponsors, which enabled Cheever Racing to progress over the next few years.

In 2007, Cheever Racing made an agreement and purchased the intellectual property rights to the Fabcar Daytona Prototypes chassis made by Fabcar. Eddie Cheever Racing had begun by running a

Porsche-powered Crawford DP03 before switching to the Fabcar. The cars would be renamed Coyotes, running with GM Pontiac engines, though Cheever eventually put the 5.0-litre Lozano Brothers V8 Porsche Cayenne-based engine in his Coyotes. Over the years, the new Coyotes enjoyed considerable success.

The first Coyote-Lozano Porsche would run at the Homestead 250 Miles with drivers Guy Cosmo/Mark-Antoine Camirand. They had been 6th on the grid but ended up 25th at the flag, the car being the former Fabcar FDSC 03-02.

Eddie Cheever is recorded as saying: “When we first got the Fabcar, we had a lot of learning to do. The Porsche-based V8 motor, though, looks to be strong, and it’s nice to have another 5-litre motor to work with. It is very cool to be doing initial testing with a new power plant and having a third engine in the Fabcar to compare is a big deal for us.” This would be that Lozano Brothers-built Cayenne V8.

The Crown Royal Daytona Prototype seen here at the Watkins Glen Six Hours of the Glen, 9 June 2007: 18th overall for Christian Fittipaldi/Harrison Brix/Antonio García. (MW)

Pit work for Cheever Racing. This car had a flat-six Porsche engine at the 2007 Sahlen's Six Hours of the Glen. (DM)

At the Daytona 250 Miles on 3 July, Guy Cosmo/Marc-Antoine Camirand finished in 10th overall. However, a string of dnfs also accompanied the 5-litre Cayenne-Lozano Coyote during 2008, whilst the Pontiac version of the old Fabcar proved more reliable. Cheever continued to race the No 09 car through 2009 with a new livery and a new name – the CC/09-001. 13th on the grid and a 23rd place finish at the Rolex 24 Daytona was followed by a 10th at the Virginia 25 Miles, 26th at New Jersey 25 (6th on the grid here), a dnf at the Glen, then 11th at Mid-Ohio, and a dnf at the Daytona 250 Miles. Up to this point Scott Russell/Guy Cosmo were behind the wheel in 2009. But a good 4th overall at the Barber 250 Miles was achieved with Antonio García/Buddy Rice doing the driving.

There was no luck at the Daytona 24 Hours of 2010: dnf. A string of 8th, 7th, and also-ran positions was finally rewarded with podium and 3rd at the 2010 Watkins Glen 6 Hours for García/Rice from 4th on the grid, demonstrating that they had found the right settings. 191 laps of racing saw them finish on the same lap as the winning 2004

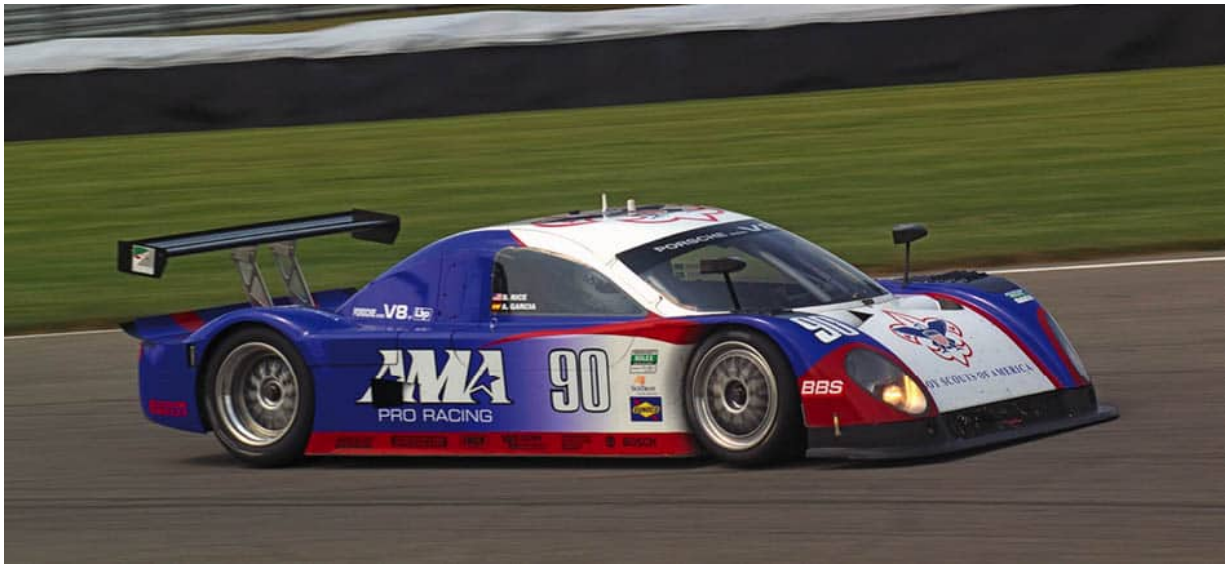
Riley BMW of Scott Pruett/Memo Rojas; 29 starters raced for the $275,000 prize fund. Two weeks later, they took 5th at Mid-Ohio, 5th again at Watkins Glen in August, and 5th at the Montreal, Canada, race on 28 August. The car raced on into 2011, taking a pole grid position on one occasion.

The Lozano Brothers' V8, now powering the Fabcar-Cheever Coyote FDS CO3 at the Daytona 24 Hours, 22nd on the grid to 15th overall for Guy Cosmo/Marc-Antoine Camirand/Michael McDowell. (DM)

The Spirit of Daytona Racing entered the No 09 Cheever/Fabcar, now called a Coyote, seen here at the 2008 Watkins Glen Six Hours of the Glen, driven by Guy Cosmo/Marc-Antoine Camirand/Terry Borcheller. It featured the Lozano Brothers' V8 5-litre Porsche Cayenne-based engine. (DM)

The Lozano Brothers-created V8, based on the engine of the Porsche 5-litre V8 Cayenne. (MW)

The CC/09-001 No 09 was to be seen at the 2009 Watkins Glen 200 on 7 August. It was a dnf, but the drivers were again Antonio García/Buddy Rice in the new all-Cheever Coyote. (MW)



The Coyote CC09-C001 from the 2009 Indy test, driven by Buddy Rice/Ed Carpenter. (MW)

♦ ♦ ♦ ♦ ♦

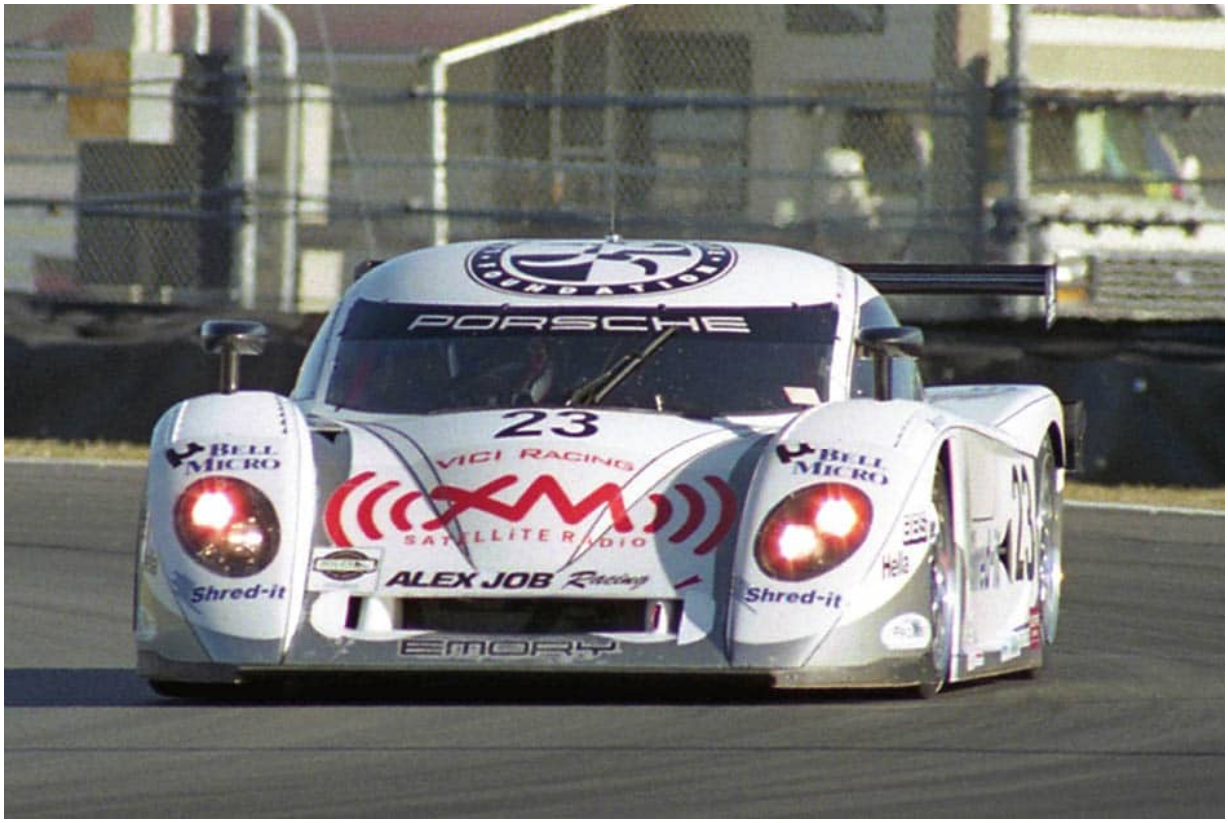
Crawford-Porsche

Max Crawford is the man behind Crawford Composites, specialist in composite constructions, the material that took over from the aluminium honeycomb construction for race cars. New Zealander Max started his career as an apprentice mechanic in 1966. Between then and 1980, Max Crawford honed his craft as an engineer while doing some local racing. He met his wife and created Max Crawford Motors Ltd. In 1980, they moved to California with their family to pursue Max's dream of world endurance sports car racing. Beginning with Dick Barbour Racing, Max went on to serve as crew chief for John Fitzpatrick Racing from 1981 until 1985, where his team successfully campaigned a multi-car Porsche team in IMSA in America and around the world. It was while working with the Fitzpatrick 962 Porsches that Crawford expanded his competency at the application and development of carbon-fibre composite technology. In 1988 the Crawford family once more set out on their own, moving to North Carolina and establishing Max Crawford Composites. In 1996, they founded Crawford & Crawford Composites Inc, designing, engineering, and supplying components to the major racing series, including IMSA, Grand-Am, ALMS, Indy Car, and NASCAR. This was followed by the team designing and building its own race cars, Crawford Race Cars LLC began in 1998. In the early 2000s the Crawfords were running an open-top car in the Sports Racing Prototypes class. Working through Howard-Boss Motorsports, in 2003 Max Crawford debuted the DP03 Daytona Prototype.

To compete with Fabcar in the 2004 Daytona 24 Hours, three cars were made: 001, 002 and 003, using Pontiac and Chevrolet engines. A further six chassis followed and eventually a Porsche flat-six engine was installed for 2006 in the Alex Job Racing-Emory Motorsports Crawford Daytona Prototype. Alex Job Racing (AJR) says itself that it benefited from the technology developed by Porsche Motorsport, and although it had run several Fabcars for 2006 it had switched to a Crawford DP03 for the 2006 Rolex 24 at Daytona. Porsche aces Patrick Long/Mike Rockenfeller/Lucas Luhr would get pole position,

which after 24 hours of hard racing was translated to 3rd on the podium. Long/Rockenfeller then went on to win at the Homestead Raceway on 23 March, after having taken pole once more. At Long Beach on 8 April they were 2nd, while at Virginia on 23 April they won again, this time with the colours of Ruby Tuesday Championship Racing on the car.

So arrived the Crawford DP03 Daytona Prototype in 2004. It was first built to use a Chevy/Pontiac engine, here we see the spec sheet for the Porsche version. (Meluzio)



Daytona 24 Hours 2006 Patrick Long/Mike Rockenfeller/Lucas Luhr would start from pole and finish 3rd overall in the now Porsche-powered Crawford Daytona Prototype DP-3 009. (MW)

The rest of the season saw the Alex Job Racing team 3rd at the Barber 250 Miles and 3rd at the Watkins Glen 200. Several pole positions and top-3 starts demonstrated the capabilities of this car. Its sister car, the No 39 Crown Royal-sponsored Crawford DP03 chassis 14, started the year with a Lexus engine but moved to Porsche power by the time of the Mexico 250, where Eddie Cheever/Christian Fittipaldi finished 6th. They got a 2nd overall at Homestead, but dnf'd at Long Beach and came 13th at the Watkins Glen 6 Hours.

The No 23 car at Laguna Seca set pole position, but the end result was 38th! Again, at the Phoenix 250 the Ruby Tuesday car was well up in qualifying, on the front row again, but the race result did not reflect the start position, ending in a 29th place. In June at the Watkins Glen Sahlen's 6 Hours of the Glen, it was a dnf for the No 09

car, while the No 23 car finished 15th this time.

At the Mid-Ohio 250 Mile on 24 June 2006, Rockenfeller/Long were starting from pole but only finished 34th. The sister 39 car fared little better: a fine 3rd on the grid ended up with a 32nd at the flag. However at the end of the month at the Daytona 250 Miles Rockenfeller/Long reached the finish 2nd overall from 7th on the grid. The No 39 car was 9th overall.

They were on a roll in the Ruby Tuesday No 23 car at the Barber 250 on 30 July, with a front-row start and a 3rd overall finish. At the Watkins Glen 200 it was another podium: 3rd overall from P3 on the grid. In September at the Miller 9 Hours, a 2nd on the grid ended with a 10th overall, with the 39 sister car in 11th. Though obviously one of the fastest cars around, it was evident that the Porsche-powered DP03 No 23 car did have a tough time on occasions. The No 39 Crown Royal car performed well, but with no top-position results.

Not only a 3rd at Daytona: the Crawford Porsche then went on to win at the Homestead Raceway on 23 March 2006 after having taken pole, following that with a 2nd at Long Beach on 8 April. (MW)

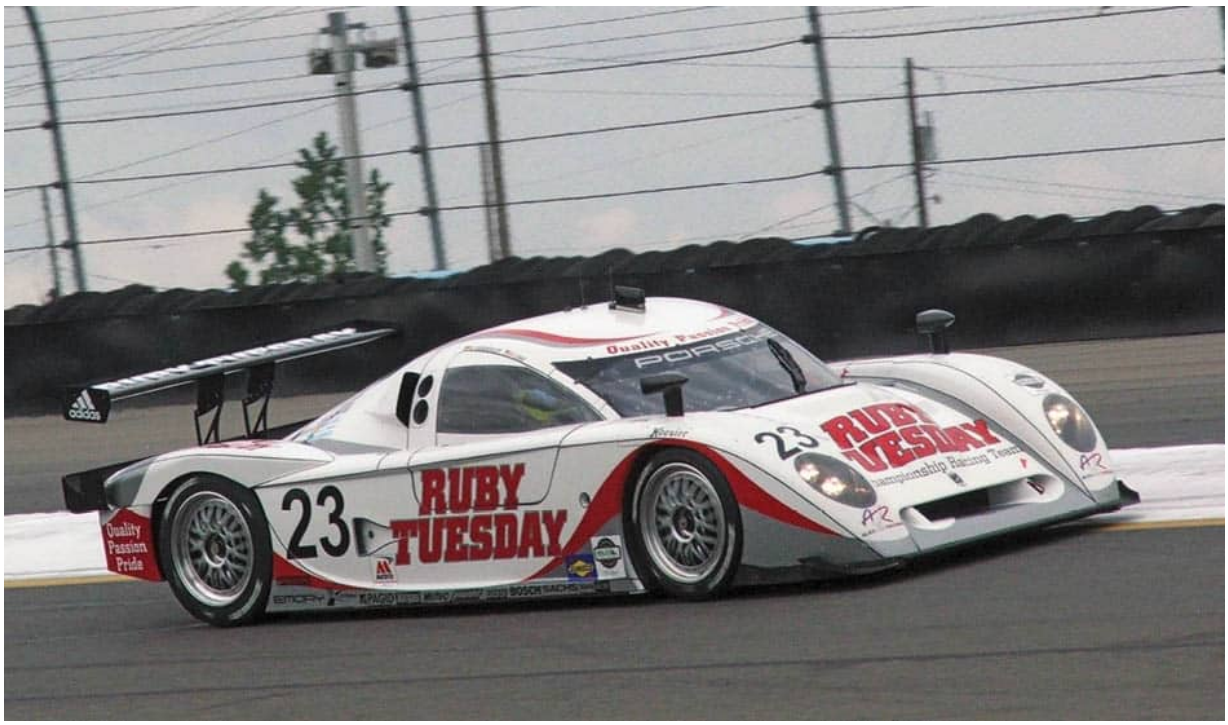
In 2007, in the No 23 car, Patrick Long/Romain Dumas/Jörg Bergmeister did the driving at the Daytona Rolex 24 Hours, and Long/Bergmeister drove the car for the rest of the season, winning at Laguna Seca. Vision Racing now also entered the fray, with the Crawford DP03 chassis 15 that had run with a Lexus engine in 2006. It would now be Porsche powered, but it failed to finish at Daytona in the Rolex 24. Vision Racing had started out with Indy car racing; the team was run by Tony George. He dipped his toe in the Daytona Prototype water with the Porsche-powered Crawford DP03 and an almost all Indy car line-up of drivers, the No 00 Vision Racing Porsche Crawford DP03 being driven by Ed Carpenter/Tomas Scheckter/Tony George/Anthony Foyt/Stéphane Grégoire.

Four Crawford DP Porsches were to start the 2007 Daytona 24: the aforementioned Vision Racing entry; Ruby Tuesday Racing (still

run by Alex Job Racing, but called Ruby Tuesday Championship Racing for sponsorship reasons); the Howard Motorsports entry Thetford-sponsored car No 16 that had switched to Porsche power; and Cheever Racing with the No 39 Crown Royal DP03. Only the Ruby Tuesday entry and the Crown Royal car finished; the others dnf'd.

The No 23 car of Ruby Tuesday Racing, under Alex Job, had to wait until 20 May 2007 at the 400km Laguna Seca for top result. Patrick Long was joined by Jorge Bergmeister to qualify 3rd on the grid and take the overall victory. At the Watkins Glen 6 Hours, the No 23 car was starting from 3rd on the grid, but there was no win this time – 8th was the highest they could manage. For the rest of 2007, it would be only Porsche engines in the Crawfords, bringing several top-ten finishes, but equally a few failures. Crawfords returned the following year at the 2008 Rolex 24 with the same car, the No 03 Vision Racing Crawford-Porsche, with Ed Carpenter/Anthony Foyt/Vitor Meira/John Andretti driving.

The Cheever Racing Crawford DP3-014 at the 2006 Watkins Glen 6 Hours: Eddie Cheever/Christian Fittipaldi/Hoover Orsi only 13th, two places ahead of its sister car. (MW)



Watkins Glen, Sahlen's Six Hours of the Glen: the No 23 car finished 15th. Mike Rockenfeller/Patrick Long. (MW)

DP03-15 at Daytona 2008: originally ran with a Lexus engine before switching to Porsche. Vision Racing with Ed Carpenter/Tomas Scheckter/Tony George/Anthony Foyt/Stéphane Grégoire had raced it in 2007 as No 00. (DM)

Chris Dyson/Rob Dyson/Oliver Gavin/Guy Smith: Crawford-Porsche DP3-004 2007. It is thought this car was running a flat-six 3.9 engine. (MW)

For 2008 the entry was once again the No 23 Alex Job Racing Porsche-powered Crawford DP03, at the start for the Rolex 24, with Bill Auberlen/Joey Hand/Patrick Long/Andy Wallace driving, still racing with the flat-six Porsche unit. Unfortunately, it was a dnf. But in the 250 Miles at Homestead, Bill Auberlen/Joey Hand took the Ruby Tuesday car to 2nd overall. In the Mexico City 200 Miles they were 15th, and at the Virginia 250 Miles 7th. At Watkins Glen for the 2008 6 Hours it was a dnf.

The results were slipping away from Alex Job Racing, and, at the end of 2008, the team switched to a flat-six Porsche-powered Riley. The DP03 had brought many successes to Crawford customer teams, and to the Crawford's own factory team, Howard Motorsports (a partnership with long-time friend Rick Howard). Design, development, engineering and testing were continued with the

evolution of the Crawford DP08 Prototype, a racing car that incorporated the knowledge and best proven elements of the DP03 and the Crawford SSC2K. The later projects would use Chevrolet and Pontiac power, so are no longer on the schedule of our work here. Crawford is still a highly respected organisation today.

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Doran Racing-Porsche

Kevin Doran designed and built the Doran JE4 Daytona Prototype. It was first seen in 2002 and started out with Chevy power, with some success. Teams campaigned the chassis with BMW, Lexus and Chevy power, but, eventually, in 2006 Doran installed a flat-six Porsche engine, and Synergy Racing campaigned the car. 7 January 2006 saw the JE4 chassis 004 take to the track at the Daytona test, with a Porsche engine installed – an Andial Porsche 3.6; it was 11th fastest. The car had been built in 2004, and had previously run with BMW engines. For the Rolex Daytona 24 Hours of 2006 the No 8 car, with Brian Frisselle/Burt Frisselle/Clint Field/Patrick Huisman doing the pedalling, qualified 11th; hopes were high, but unfortunately they were to dnf on lap 206.

The JE4-004 would run throughout 2006 with Porsche power. At the Mexico 250 Miles, the Frisselles finished 10th from the front row of the grid. At Homestead for the 250 Miles, they qualified 5th, but it was then to be dnf. A series of dnfs followed until at the Watkins Glen 6 Hours, where the Frisselles were joined by Al Unser Jr, they finished 9th overall from 22nd on the grid. At Mid-Ohio it was to qualify 5th on the grid, but come the race it was a sticky time, and the JE4 Porsche finished in only 37th place. The team didn't turn up at the Daytona 250 Miles, and did not finish at the Barber 250 or the Watkins Glen 200. Spencer Pumpelly/Patrick Huisman started from P11 on the grid at Sears Point on 26 August and finished 15th, but at the Miller 9 Hours it was another dnf; Russell/Scrogham are listed as driving. Rich Knoop/David Murray finished 15th at the Watkins Glen 250 Miles from 12th on the grid. This appears to have been the car's last race.

2006 Daytona: Brian Frisselle/Burt Frisselle/Clint Field/Patrick Huisman doing the pedalling. They qualified 11th; hopes were high, but unfortunately they were to dnf with engine problems on lap 206. (MW)

The Doran JE4: not a strong race at Mid-Ohio for Brian and Burt Frisselle. (MW)

A good try with some early success, but the JE4 with Porsche power didn't set the world on fire. (MW)

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Riley-Porsche

Riley Technologies came out of the Riley & Scott organisation, which was originally founded by Bob Riley and Mark Scott in 1991; Riley & Scott had been pretty successful over the years, though not using Porsche engines. In 1999, Reynard Motorsports made a bid, and acquired Riley & Scott – the acquisition was part of Adrian Reynard's (Reynard Motorsports) plans for expansion. However, this was a move doomed to failure, and Reynard was soon to find that it was a bridge too far, and the organisation was not able to survive, the company filing for bankruptcy in 2001. Reynard and Riley & Scott were dissolved. Following this, in 2001, Bob Riley and his son Bill set up their own company, Riley Technologies, to continue construction of various Riley & Scott projects and look after the existing Riley & Scott

customers.

Riley introduced the Mk XI 001, 02 and 03 Daytona Prototype chassis in 2004, first with a Pontiac and then Lexus and BMW engines, through to chassis 021 on 25 March 2006, when a Riley powered by Porsche would be seen on track at the Homestead 250 Miles. The chassis was a Mk XI chassis 007. American drivers Rob Morgan/Charles Morgan entered the TruSpeed Motorsports car; having qualified 17th on the grid, they would climb up to 9th overall. Later that year, 2006, Bob and Bill Riley moved their works to Mooresville, NC; already they were a leading constructor, like Fabcar and Crawford. By this time, several of the racing teams were moving on from their original suppliers, as the Rileys were proving to be extremely competitive.

24 June 2006: Mid-Ohio, the Riley-Porsche of father/son pairing Charles and Rob Morgan, 16th overall. (MW)

Brumos had now switched from Fabcar to Riley; along with several other race teams, they would be using the Andial Porsche 3.8- and 3.9-litre engines, the chassis here is the Riley Mk XI 029. (MW)

At the Grand-Am Long Beach race on 8 April, the Porsche-powered Riley XI 007 would finish 13th overall from 19th on the grid. Mid-Ohio on 24 June brought a 16th overall. Then 18th at the Barber 250 in July, where the Morgans were joined by BJ Zacharias. It was at this race meeting that we see more teams switching to Riley-chassised cars, Brumos Porsche being one of the major players. David Donohue/Darren Law would be in the Brumos Red Bull Riley-Porsche Mk XI 029. The Brumos 58 car finished 13th.

At the Watkins Glen 200, the Brumos No 58 car would finish 6th from 13th on the grid, and, at the 250 Miles race at Sears Point, 8th overall. Brumos had been impressed early on, and had acquired a second new Riley chassis, Mk XI 030. Hurley Haywood/Jim France would drive it, finishing 19th at Sears Point.

At the Miller 9 Hours on 2 September, the TruSpeed Motorsports No 47 car, with drivers Morgan/Morgan/Zacharias, finished 15th overall, while the Brumos Red Bull No 58 car of David Donohue/Darren Law/Buddy Rice came home in 7th overall. However, Hurley Haywood/Jim France/Roberto Moreno failed to finish, starting low on the grid in 21st.

At the first race of 2007, the Rolex 24 Hours at Daytona, no less

than 19 Riley chassis lined up out of the 69 starters. Four Porsche-powered Rileys would be involved. The Brumos boys consisted of veteran genius Hurley Haywood with Jim France/Roberto Moreno/João Barbosa; they would come home 4th overall, just 4 laps behind the winning Riley Lexus of Scott Pruett/Juan Pablo Montoya/Salvador Duran. The first ten cars were Daytona Prototypes, and the first six were Rileys! The No 47 Riley-Porsche of the Morgans plus Timo Bernard/BJ Zacharias was 8th. No luck for the Donohue/Law car this time; after posting 4th fastest in qualifying they slipped to 40th overall. The 58 car would run again at the Mexico 400km, coming home 6th; the 59 car dnf'd. At the 400km Homestead race on 24 March, the Brumos Riley-Porsches finished 4th and 5th. Then in the Virginia 400km on 29 April, the 58 Red Bull Riley of Donohue/Law was on the podium 3rd, from 3rd on the grid, the 59 Haywood/France entry being 13th overall. Donohue/Law dropped one place to 4th at Laguna Seca and Haywood/France to 14th. Watkins Glen 6 Hours saw 58 finish in 9th and 59 in 16th.

16th at Watkins Glen 2007 for Haywood/France/Barbosa in the Brumos Riley chassis 030, fitted, it is thought, with a 3.9-litre at this stage. (MW)

Donohue/Law: 12th on the grid led to a 9th finish overall in Riley chassis 029 at Watkins Glen 2007. (MW)

The 2008 chassis 029 in the livery of Brumos, with the familiar orange striping for identification on the 58 car – it was green on the 59. (MW)

Donohue/Law again showed their car to be the fastest of the Brumos cars when a 5th grid place for the No 58 car led to a 5th-place finish, while the No 59 was 14th on the grid and finished 15th overall at the Brumos Porsche-sponsored Daytona 250 Miles 'Pepsi 400' on 5 July. Over the next five races, the results followed a similar pattern with the two Brumos Rileys. The same again on 28 August for the Sonoma 400, but this time the 58 was 2nd overall from 3rd on the grid, the 59 being 11th overall from 12th on grid. However, come mid-September, and the Miller 1000km, the Donohue/Law car dnf'd (4th on grid); the Haywood/France/Borcheller entry was 6th overall from 14th on the grid.

For 2008, both Brumos cars would carry their own company liveries and were white, with fluorescent orange striping for the No 58 Law/Donohue/Rice Riley-Porsche, and fluorescent green for the No

59 France/Borcheller/Haywood/Barbosa entry at the Rolex Daytona 24 Hours on 27 January. Neither car ran well, finishing 27th (58) and 23rd (59).

It is understood that both cars had been updated and running with the 3.9 Porsche Andial engine for 2008. After the Daytona, which was quiet in terms of results, the 250 Miles at Homestead on 29 March livened things up, at least in qualifying, as Donohue/Law took pole position. Their result, though, was not a happy one: 43rd! Jim France/João Barbosa in the chassis 030 Riley-Porsche finished 7th overall from 13th on the grid. Law/Donohue were 3rd on the grid at the Mexico 250 and finished 11th; France/Barbosa, 17th on the grid, finished 8th overall. Laguna Seca saw Donohue/Law again on pole with a 5th overall. 7 June and it's Watkins Glen 6 Hours again: 2nd overall from 4th on the grid for the 58 Riley with Donohue/Law aboard, while France/Haywood/Barbosa started from 11th and finished 9th.

Donohue and Law took their 3rd pole of the year at the Mid-Ohio Grand-Am, and finished 2nd overall. France/Barbosa were 17th on the grid and finished 5th. Top five finishes for the Brumos team with one or the other of the Rileys continued for the next seven races of 2008, proving the speed and reliability of the product. The Brumos pair of Rileys were joined in July 2008 on the 20th by the Alex Job Racing Riley Mk XI chassis 007 Ruby Tuesday car with Bill Auberlen/Joey Hand doing the driving. From 9th on the grid they would finish 12th overall.

Penske Racing's Riley Mk XI 028 at Daytona 2009 – the black No 16 Crown Royal car from Rolex 24 2009 – 2nd on the grid, 6th overall. Far left is driver Ryan Briscoe, followed by numerous crew guys, then second from right driver Timo Bernhard, and far right driver Romain Dumas. (DM)

Yet another Porsche-powered Riley, chassis 05, arrived at the Watkins Glen 200 on 8 August. Driven by Carlos de Quesada/Jean-François Dumoulin/Scooter Gabel, the car entered by Alegra Motor Sports ran with No 22, and would qualify 19th and finish 16th. The most reliable of the Riley cars was the Brumos 58 car of Donohue/Law, regularly taking front-row positions and finishing in the top three. Also, we are now seeing more Porsche engines in use. The Nos 23-58-59 cars were out again at Infineon for the 250 Miles; France/Barbosa finished 4th on this occasion. The No 59 car repeated that performance at the New Jersey 250 Miles on 31 August, while the No 58 car was down in 10th this time. At the Miller 1000km on 20 September, France/Barbosa were 4th again, but the

Mk XI chassis No 05 of the Alegra team failed to finish. Law/Donahue were 10th, and the Alex Job Ruby Tuesday car was 8th.

Penske Racing joined the Porsche engine entries at the Daytona test on 29 October, with Riley chassis Mk XX 36. Penske had a second car there, too, also a Riley, running with the 5T number.

For the Rolex 24 Hours at Daytona on 21 January 2009, Terry Borcheller would join Hurley Haywood/João Barbosa/Jim France in the No 59 Brumos car, chassis 30; they qualified 7th and finished on the podium in 3rd. This time power would be a Porsche V8 5-litre from the Lozano brothers.

Through 2009 the Rileys powered by Porsche continued to be successful, with a handful of podiums, including a 3rd at the Watkins Glen 6 Hours in the June. Before that, Penske Racing would see Romain Dumas/Timo Bernard put their Verizon Riley 036 5-litre Porsche on the front row of the grid and finish 7th overall at the Virginia 250 Miles in April. Law/Donohue would be 3rd overall.

Pole position and outright victory would come at the 2009 Rolex Daytona 24 Hours for the Brumos Riley Porsche. (DM)

The Mk XI 30 of France/Barbosa/Haywood at Watkins Glen 2009: 6th from 17th on the grid. (MW)

At the Mid-Ohio 250 Miles, the No 59 Brumos Riley, 14th on the grid, took 5th overall; Verizon Penske No 12, from 6th on the grid, took 4th overall and the No 58 Brumos car 10th. The Penske Riley slipped to 15th from 7th on the grid at the Barber 250 Miles, while Law and Donohue in the Brumos 58 were 10th and France/Barbosa in the 59 9th. Again, a plethora of Rileys were at Watkins Glen on 7 August for the Watkins Glen 200 Miles. The Brumos No 58 car got the best result, coming home 6th. In Canada on 29 August, it was the Verizon Penske Dumas/Bernard-driven car that did the job, coming home 2nd overall from P3 on the grid. The No 58 Brumos car, starting from 16th on the grid, came in with a fine 5th after such a low start. At the Miller 250 Miles in September (remember, this used to be 9 hours, then was cut to 1000km and now just 250 miles), the No 12 Verizon Penske Riley was 4th overall, having started from the front row of the grid. The No 59 Brumos Riley was 7th, and No 58 Brumos entry 9th. There was a surprise, and a happy one, at the Homestead 250 Miles on 10 October: in his 61st year, Hurley Haywood with João Barbosa took victory, having started from a lowly 14th on the grid. The No 59 Brumos Riley finished 5th. The 2010 Daytona 24 Hours beckoned. Action Express Racing were out with a relatively old chassis, the Riley Mk XI 018, with João Barbosa/Mike Rockenfeller/Terry Borcheller/Ryan Dalziel aboard with what is thought to have been a 5-litre Lozano-Porsche engine in the back. They won outright from 8th on the grid.

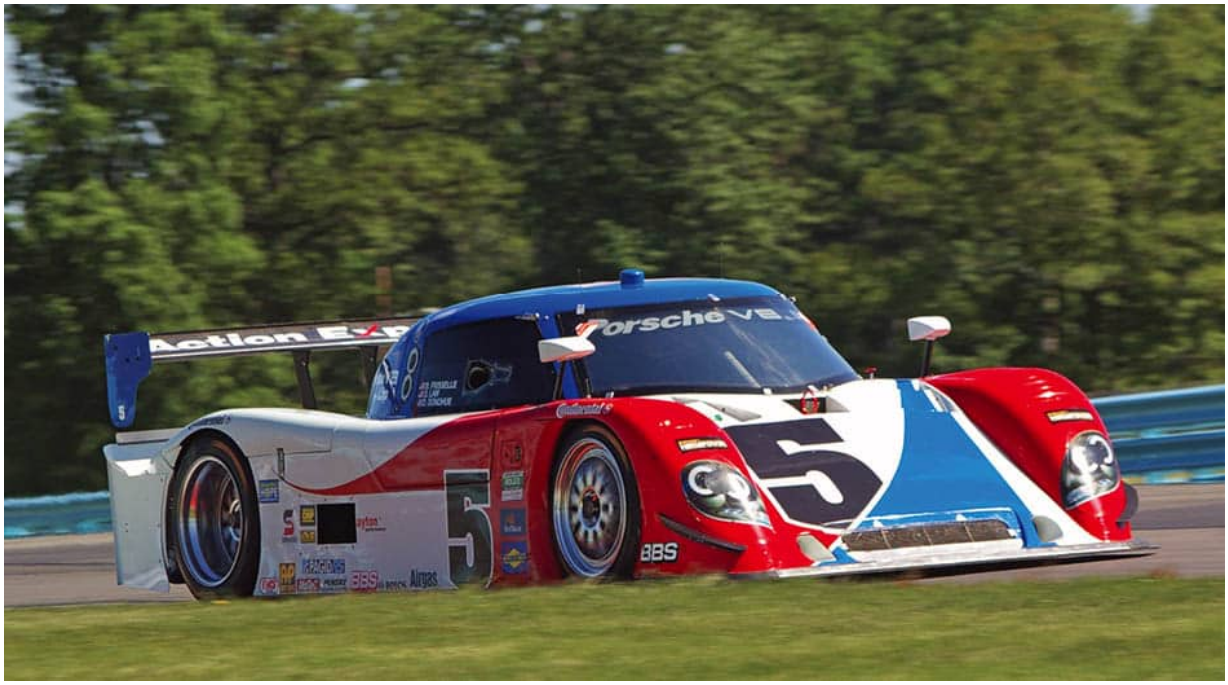
At the Miami Grand Prix, Law/Donohue in the No 59 Brumos Riley were on pole position, but didn't hold it to the end, coming in 2nd. The Brumos Porsche team was only going to run one car for the 2010 season, so this was not too bad, having failed at Daytona. The Action Express No 9 Riley would be 10th at the Grand-Am Barber meeting, whilst the Brumos car finished 5th. Then at the Bosch Engineering 250 at Virginia on 24 April, the Brumos car came home 4th, the Vision Racing Riley failing to finish this time. They bounced back at Lime Rock, however, from 12th on the grid to 4th overall – this time it was the No 59 that did not finish. At the Watkins Glen 6 Hours, it would be 10th for the No 9 Riley and 5th for the Brumos car.

2009 Watkins Glen 6 Hours, 3rd overall: the Penske Verizon Riley-Porsche of Romain Dumas/Timo Bernard, Riley chassis Mk XX 36. There would be12 Rileys racing at the Watkins Glen 6 Hours out of the 34 starters. (MW)

Action Express Racing with a relatively old chassis, the Riley Mk XI 018: João Barbosa/Mike Rockenfeller/Terry Borcheller/Ryan Dalziel would win the 2010 Rolex Daytona 24 Hours (DM).

An outright victory for the 5-litre Lozano-Porsche engine, winning from 8th on the grid. (MW)

It would be 10th at the Watkins Glen 6 Hours for the No 9 Riley, and 5th for the Brumos car. (MW)



The Daytona Prototype of the Action Express team, the former Brumos chassis Riley Mk XI 030 would run throughout 2011, with a change in sponsor. (MW)

Through to August there would be a run of average results for both the Action Express car and the Brumos entry until they reached Montreal on 28 August, where, although the No 9 car dnf'd, Donohue/Law brought home the Brumos No 59 Riley 4th overall from 7th on the grid; but they slipped to 9th at the Miller 250 in September. Action Express changed colours and acquired a new number at the end of the year, to run in 2011 with the old Brumos Mk XI 030 chassis, but now with the Lozano 5-litre V8 Porsche engine. This is out of our scope as we stop our story at 2010 – but can be seen in the accompanying photo.

The engines were now mostly all 5.0-litre V8 Cayenne-based units of the Lozano Brothers Porting Company from Texas.

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Gunnar-Porsche – Part 2

As we saw in the last chapter, Gunnar Racing, created by Kevin

Jeannette, obtained a 962 in the 1990s and took a decision to go open top, creating the 966 Sports Prototype. In the 2000s, the team moved to the Daytona Prototype scene as it came along; and in 2004 Brumos acquired a new chassis for the No 58 car, so the Fabcar 002 chassis became available and Gunnar Racing entered it the Rolex Daytona 24.

Gunnar Racing had also created a Prototype known as a G99, a version of the Porsche GT cars that ran at Le Mans in the 1990s. This car, however, was an all-Gunnar Racing creation. Kevin Jeannette is recorded as saying: “The car was built from a jig we fabricated using the Champion GT-1. Champion Racing was using our facility for a few years while their new racing facility was being built. When Champion chose not to use the G99 (they purchased the Lola instead), the car just sat until we decided to finish it, because of the rules in Grand-Am, which then allowed the car to run as a Spyder in 2002. However, at the Grand-Am Finale they changed their minds about the Spyder, but said it could run as a coupé in 2003.”

2004 Daytona Rolex 24 Hours: the Gunnar Racing Fabcar 002. (MS)

2002 Daytona Finale. Rejected at scrutineering: the tube-frame Gunnar Racing G-99. (MS)

This tube-frame chassised sports car idea came from the Champion Racing Porsche GT-1 005. Gunnar Racing had prepared the car for Champion Racing, who eventually switched to Lola, as will be seen in a moment. While the car was there, Gunnar had, as stated, made a jig for the chassis, ostensibly to be in a position to do repairs in the event of an accident. However, it decided to make a Spyder to run in ALMS (American Le Mans Series). At that time, the ALMS regulations stipulated that if the car type was first built in 1999, it didn't need crash testing to run in the year 2000. In the end, though, other projects intervened, and the car, named G for Gunnar and 99 for the year it was built, just sat there half built. Kevin Jeannette said in 2001 that the new Grand-Am racing people: "invited us to bring the car as an SR-1 and run it in the series for 2002, when we finished the car and took it to the Daytona Finale." However, as we see above, the car was rejected at scrutineering. It was fitted then with a 3.6-litre 4-valve GT3-R engine.

Following the rejection in 2002, the car was returned to the Gunnar Racing workshops to be converted to the GT covered car, which would be known as a G99-GT. It appeared at the Daytona test as a 911 GT1 G99 on 5 January 2003, with Gunnar Jeannette at the wheel. The car was carrying No 78, and was 29th fastest, 11.12sec behind the fastest car. At the Daytona 24 Hours, carrying No 6 and liveried as Swap Shop, it passed scrutineering, and drivers Gunnar Jeannette/Duncan Dayton/Peter Kitchak/Ron Zitza got to race; it started 22nd on the grid, but failed to finish due to engine problems. Their race had lasted for just nine laps.

Gunnar Jeannette/Stephen Bartkiw/Mark Minkin were down to drive, but it didn't happen! (MS)

The G-99 becomes the GT-99 to run at the Rolex Daytona 24 Hours, Gunnar Jeannette/Duncan Dayton/Peter Kitchak/Ron Zitza doing the driving – 28th on the grid, but the car lasted only nine laps before suffering engine difficulties. (MS)

Daytona Finale 2003: Milt Minter/Gunnar Jeannette/Kevin McQueen, last on the grid, finished 19th overall. (MS)

The G-99 GT at the 2003 Grand-Am Rolex Watkins Glen Bullwy Hill Vineyards 250 Miles: Gunnar Jeannette/Paul Newman/Kyle Petty were 7th on the grid and finished 8th overall. (DM)

Lola B2K/10-Porsche

Porsche supremo Norbert Singer says: “Dave Maraj (boss of Champion Racing) was very friendly and knew exactly what he wanted. It was amazing to see how he directed his people without any express comments, just some signs, but the team still functioned very well. He told me that he liked endurance racing and wanted to win races, not just score class victories.” This, of course, was the mantra of Porsche over many years.

“The Lola was its own chapter,” Naveen Maraj (Dave’s son) says in the fine book *Champion Racing*, choosing his words carefully: “It was sort of necessary, rather like going to school; you might not enjoy going, but at least you learnt something that stood you in good stead. Our history before the Lola was basically the Porsche GT2s and GT1s, which were ex-works cars and fairly simple.

“I don’t really know how we started with Lola, but I do know that

Herbert Ampferer, then the head of Porsche Motorsport in Germany, was involved on the engine side. They wanted to do an open-cockpit carbon monocoque car with a Porsche engine. They had done it before at LM, but it was with a Jaguar chassis. (This was the Joest-run TWR Porsche WSC95, which had one race in 96 and 97.) Dave bought the Lola with the intention of putting the Porsche engine and gearbox in the back; he asked for Porsche's help, and as a result of that new project our relationship became closer."

The Lola B2K/10: an ambitious project with many trials and tribulations, but a 4th overall at Daytona in 2002. Eventually it was doomed, even though the Porsche engineers, many working in their own time, tried hard. (P)

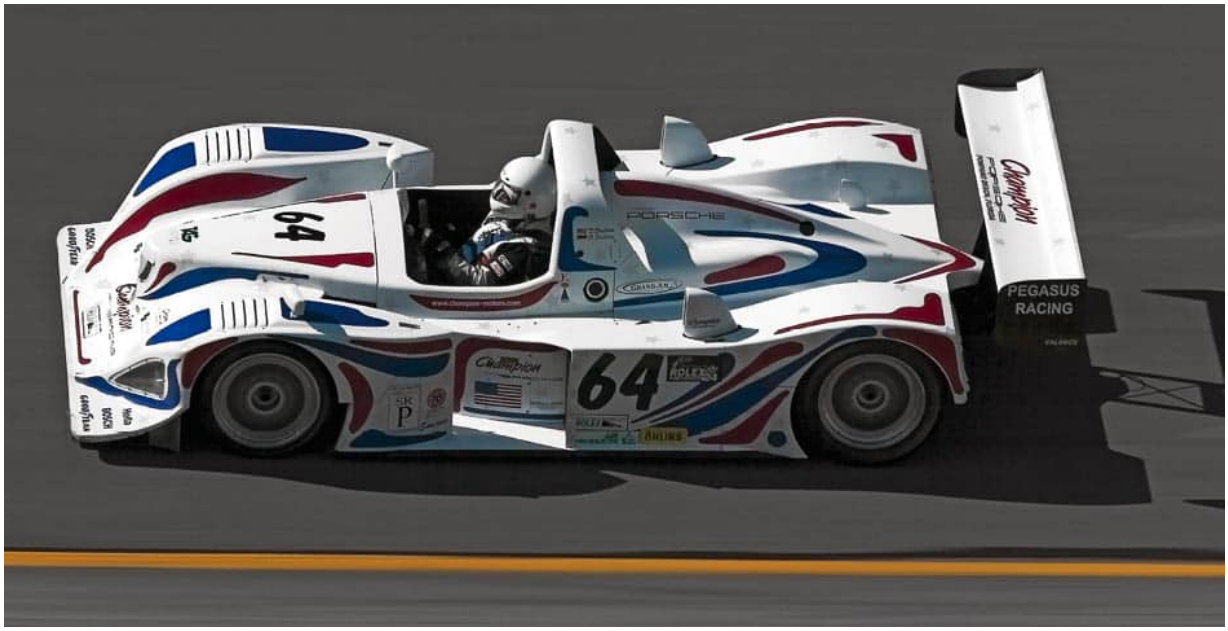
Hurley Haywood/Sasha Maassen/Bob Wollek/Dorsey Schroeder would drive the car in 2001 (dnf). As seen here, Hurley and Sasha were joined by Andy Wallace/Lucas Luhr in 2002: 8th on the grid to 4th overall. (P)

It was early in 2000 that Champion Racing, run by Dave Maraj, purchased the Lola Prototype B2/K10. As we have seen in the Gunnar Racing item, the Champion Racing team was considering a Gunnar Spyder, but then decided against it. Porsche originally was not particularly interested, even though the car was to have a Porsche engine and gearbox, until, that is, it was taken to Weissach for tests to check that the Porsche engine part of the car was operating to its best possible potential. Norbert Singer got to know and like the team, and went to the USA on several occasions to support Champion Racing. Norbert Singer told the author: “This was a nice project. Dave Maraj had a Porsche GT1 car. He bought it from somewhere, though he actually was never very keen on those cars, because he felt they were more linked to production; he really likes

Prototypes. But Porsche couldn't sell him anything, so he had the idea of buying a Lola and putting in a Porsche engine and gearbox and rear parts from the GT1. For me, it was a completely different attempt to the American teams that I had worked with on the 924s. Maraj knew it was better to listen! They were really trying to do it seriously. Dave Maraj wanted to win Daytona in 2001, and we did a lot of testing. I was there, and it was really nice working with them; it was a real pleasure for me. Really they had a chance at winning Daytona, but unfortunately, before the final preparation for the race, management wouldn't allow me to go there anymore. I had been with some of our engineers, including Valentin Schaeffer, who had done a lot of work on consumption and power and so on, but they [Porsche management] said because of all our other customers running Porsches, we were not allowed to go to Daytona. It was a disappointment to us and Dave Maraj – I can't remember what happened in the race." At the Daytona 24 Hours 2001 the team qualified 6th on the grid, but had engine failure on lap 209, about a third of the way through the race.

The year after, the engineers from Porsche had the same problem – "No, you can't go!" Norbert Singer: "So we stayed at home. Now I don't want to say that if we had been there he would have won; he didn't win, but came home 4th. Then there was a misunderstanding with Maraj and Wiedeking (Wendelin Wiedeking, then CEO of Porsche). There was an argument at the Daytona Motor Show. You know, Maraj had a big Porsche dealership selling a thousand Porsches in a year, and because this Lola project was not so successful for him, and Audi was trying to go to America, it seems he threatened to change over to Audi – this Wiedeking really didn't like. Dave Maraj is a very quiet man; he doesn't talk much about it!"

It's easy, looking back, to regard Champion Racing's Lola B2K/10 as a mistake. But it was because Dave Maraj was dedicated to Porsche that he wanted to win races with the Porsche-engined car. Maraj moved the car on to Pegasus Racing. The Lola, running in 2002 at the Watkins Glen 6 Hours, was to finish 7th; at Mont Tremblant it was 16th, and at the Daytona Finale it failed to finish.



The Lola-Porsche was moved on to Pegasus Racing for the remainder of 2002: seen here at the Daytona Finale 2002 with Oliver Kuttner/Dennis Pavlina driving. 14th on the grid would end in a dnf on lap 6 with complete brake failure. (P)

Naveen Maraj is recorded as saying: “We had such a rich involvement with the Porsche guys, and they were really nice and helpful. It was a really good family-orientated relationship. They wanted to help us, and they had a lot of spares left over from their 98 cars.”

Lola needed some business, and a deal had been done to see Porsche deliver the engine and gearbox to Lola. Lola was struggling at the time and was in the process of a change of ownership after an abortive attempt at Formula 1; money was tight. Martin Birrane, top driver and a respected motorsport businessman, was buying the company from Lola’s founding father, Eric Broadley. Two Lolas had been sold in an attempt to recover some cash – one to Team Rafanelli, the second to Champion Racing. Dave Maraj’s idea was to run a few rounds of the American Le Mans series to set the car up to be ready to tackle the Daytona 24 Hours 2001. Alwin Springer (ANDIAL) and mechanic Herman Stegmaier (Weissach) looked after the testing with Bob Wollek and, as we have seen, Norbert Singer.

The team suffered a setback at the Sebring 12 Hour race in March 2001, when tragedy struck Bob Wollek, who was keen on cycling and fitness. He was killed by an errant car driver as he was riding his cycle to the circuit.

After the Daytona 24 Hours of 2002, Dave Maraj decided to go the route of Audi and an R8, selling the Lola on to Oliver Kuttner's Pegasus Racing.

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With this look at the Lola-Porsche of fairly recent times, we draw our study on sports racing cars that were 'Powered by Porsche' to a close. Done and dusted? … Not quite, for in the next chapter we look at all single-seater cars that were powered by Porsche, plus a few extras before we finish.

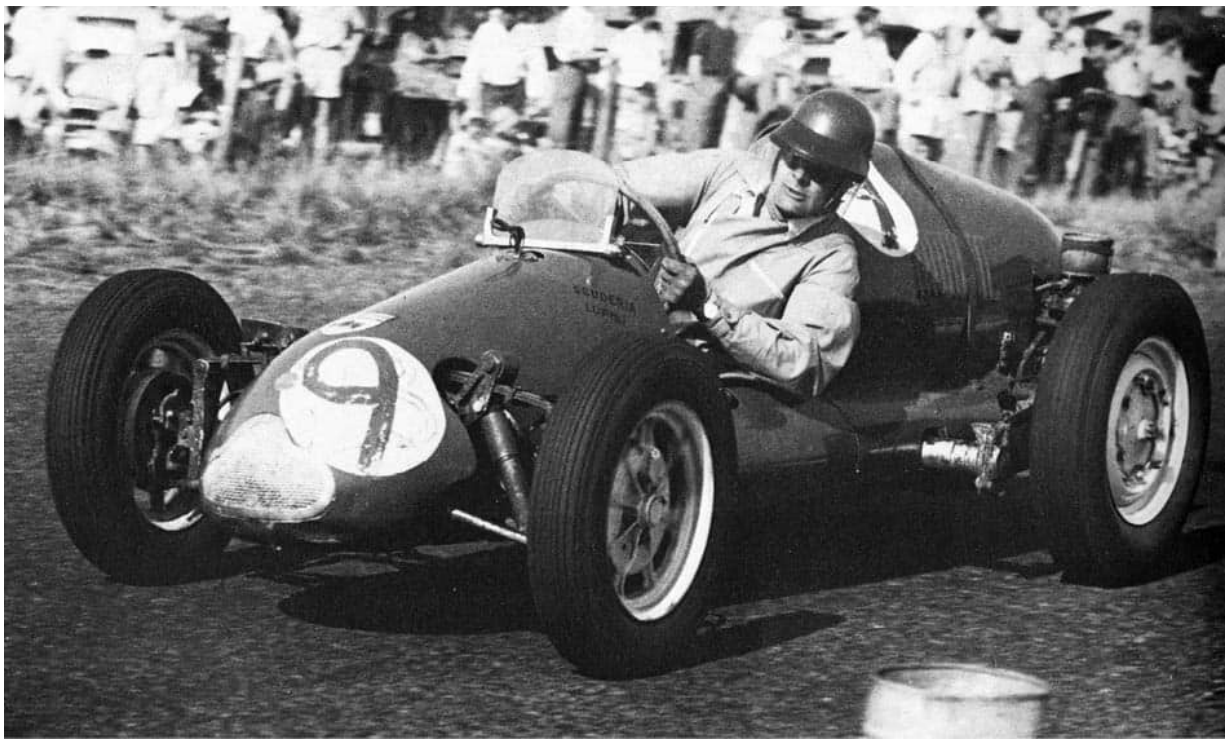
Chapter 8

Powered by Porsche – the single-seaters

As the reader may have spotted, so far we have not covered the Indy cars and Formula 1, and one or two other unique powered-by-Porsche open wheel cars. Here we address that situation with a chapter that deals with a special portion of our story, the single-seaters.

Cooper-Porsche single-seater

In the 1950s, Cooper cars were at the top of the pile when it came to the Formula 3 500s, and so efficient were these mid-engine race cars in that period, that it was not long before some people thought about replacing the motorcycle engines with the compact Porsche 356 engine, the USA and South Africa being hot-beds of this idea. First we will deviate a little from Europe to head down to South Africa to see what was going on.



Ian Fraser Jones in full flight in his Cooper-Porsche, in South Africa during the mid 1950s. (JB)

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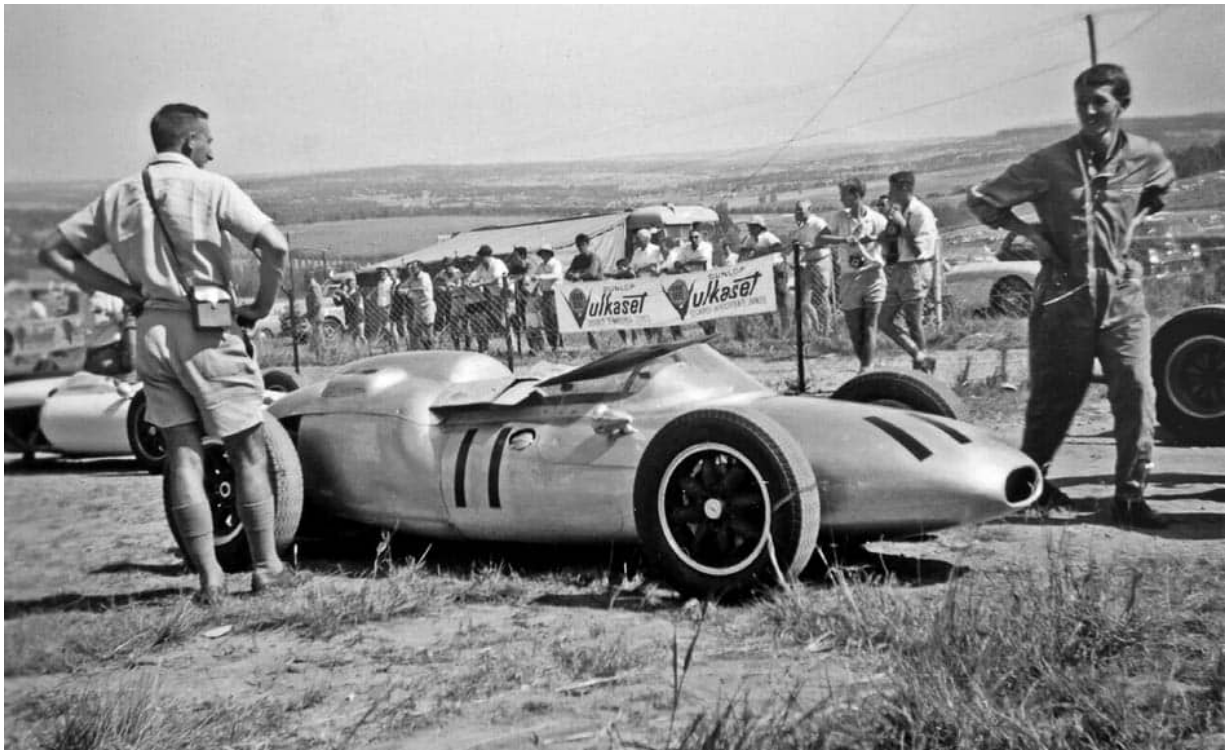
LDS-Porsche

Louis Douglas 'Doug' Serrurier was born in Germiston in the Transvaal, South Africa, on 9 December 1920; he passed away on 4 June 2006. He was a major player in South African racing in the 1960s, racing both as a driver and constructor with his own creation, the LDS special. He raced in the South African Grand Prix three times between 1962 and 1965. He had started racing cars in the 1950s with a Triumph TR2. Wanting to move up and into a single-seater, he travelled to the UK and ended up buying a Cooper T51 from Alan Brown. A well-known Cooper racing specialist, and a familiar name to British enthusiasts, Brown founded Ecurie Richmond team with Eric Brandon in the 1950s, participating in nine World Championship Formula 1 Grands Prix, and several non-Championship Formula 1 races.

The first of the LDS cars, the Mark 1 was based on the Cooper

T51, into which Serrurier fitted a Porsche RSK 718 Porsche engine. He later bought a low-line T53 Cooper which became the basis for his LDS Mk2 in 1961; this was powered by an Alfa Romeo engine, though driving through a Porsche five-speed gearbox. Serrurier raced in three South African Grands Prix, making his F1 debut in 1962. It is also worthy of note that the well-known South African racing driver, John Love, on several occasions campaigned an LDS which used a Porsche engine. He won the Formula 1 Rand Autumn Trophy race at Kyalami on 17 March 1962.



The Doug Serrurier Porsche-powered LDS, based on the Cooper Type 51. The No 11 LDS Porsche Mk1, entered by Arthur Pillman was driven by John Love, here seen at the 1962 Rand Autumn Trophy, Kyalami, 17 March 1962, where Love qualified P3 on the grid. Over 48 laps, John Love would win the race. (VP)

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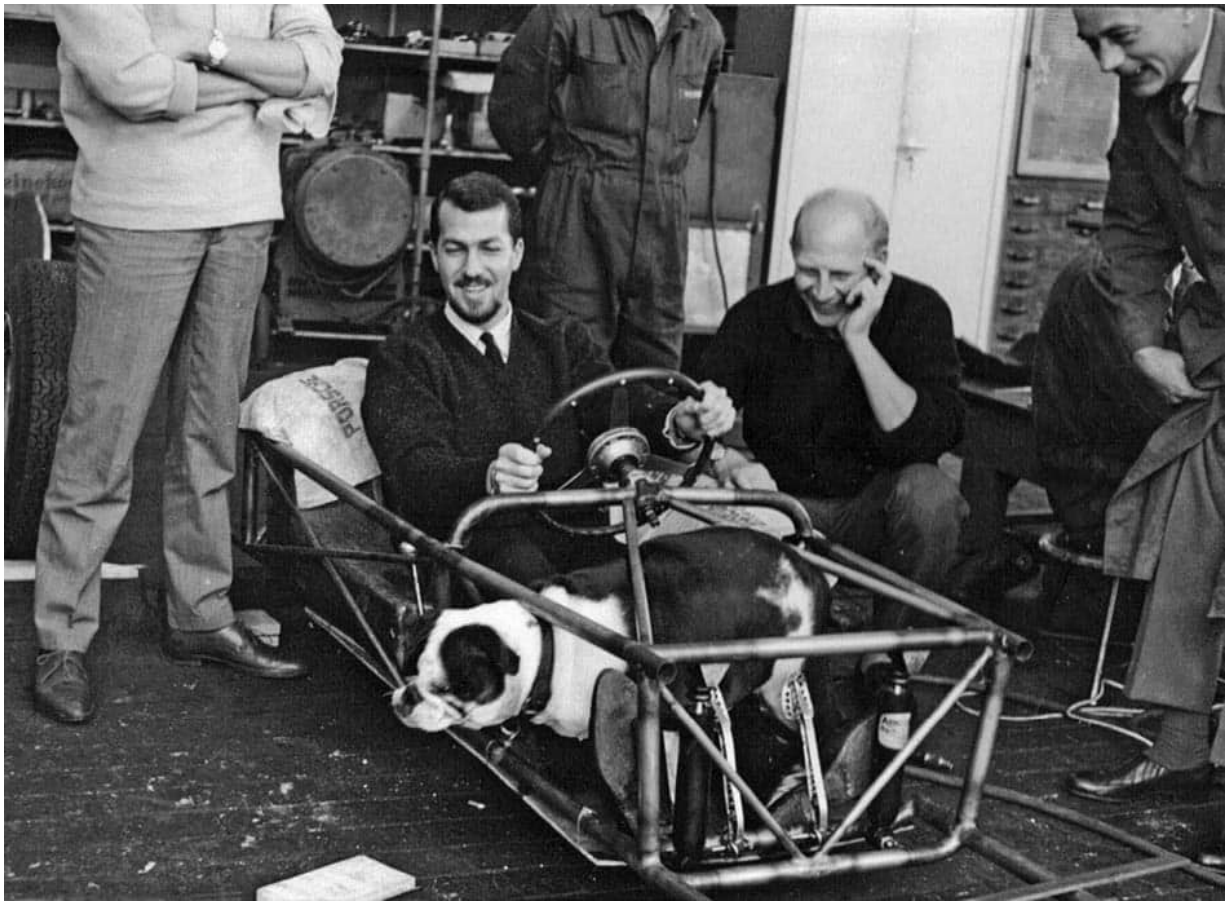
Jennings-Porsche

This car was the creation of Bill Jennings, based initially on a modified

Porsche RSK chassis. He entered the car at the IV Rand Grand Prix, on 9 December 1961 at Kyalami, over 75 laps of the 4.087km circuit. He qualified 19th on the grid, some 10 seconds slower than the pole sitter, one James Clark in a Lotus-Climax. In the race, Jennings came home 11th on 67 laps.

At the Natal Grand Prix on 17 December 1961 at Westmead, over 89 laps of a 3.620km circuit, the Jennings Porsche, starting from 18th on the grid, was to finish 9th overall – the winner again, Jim Clark. At the VIII South African Grand Prix, 26 December 1961 at East London, Jennings qualified 17th and finished 12th overall. Things were going downhill, though, by the time of the Cape Grand Prix on 2 January 1962 at Killarney. Due to unknown problems he did not record a qualifying time, and started from the back of the grid, recording a dnf. Andre Loubser in South Africa, who kindly supplied this information, says the Fuhrman four-cam engines were very complex. He used to work in the Porsche Sales Department in 1962 and says: “It was suggested that I do a three-month technical course in all departments to familiarise myself with the cars. I assembled one of the engines. Total nightmare and it took hours!”

The Jennings Porsche at the 1960 South African Grand Prix. (JB)



The start of a new Jennings tube version of the 718/2: a wonderful shot from the period showing Joachim Bonnier with passenger trying the layout for size! (AL)

Whilst we do not have the full story of all the Cooper Porsches, we do have the race records of Bill Jennings' powered-by-Porsche single-seater:

Date	Event	Track	Race	Car	Position
17/12/60	Cape GP	Killarney	18	Jennings	10th
27/12/60	South African GP	East London	21	Jennings	17th
4/3/61	van Riebeeck Trophy	Killarney	14	Jennings	3rd
3/4/61	Coronation 100	Pietermaritzburg	27	Jennings	dnf, crash
10/7/61	Border 100	East London	5	Jennings	dnf, piston
4/11/61	Rand Spring Trophy	Kyalami	7	Jennings	
9/12/61	Rand GP	Kyalami	19	Jennings	11th
17/12/61	Natal GP	Westmead	19	Jennings	9th
26/12/61	South African GP	East London	19	Jennings	12th
2/1/62	Cape GP	Killarney	19	Jennings	dnf, valve

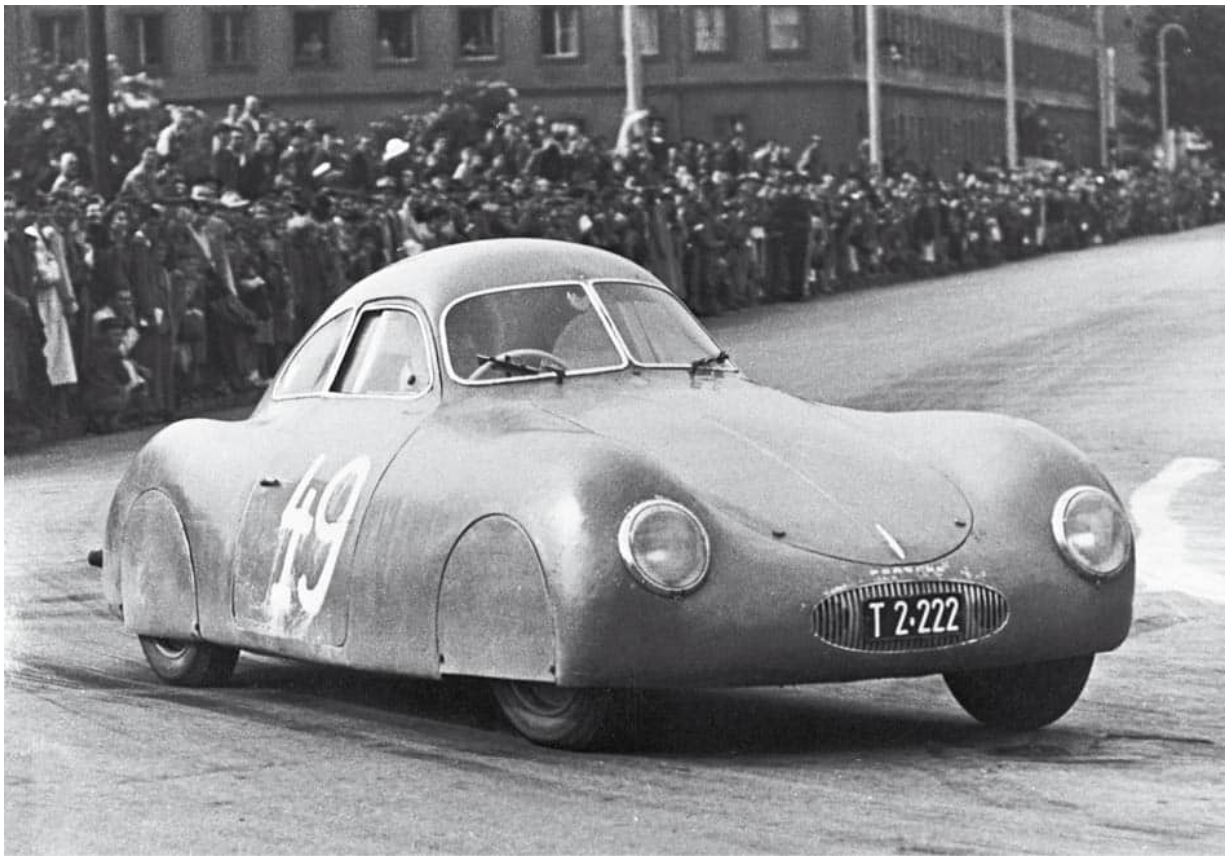
Now we return to Europe and continue the 'powered by Porsche' single-seater story.

Mathé-Porsche

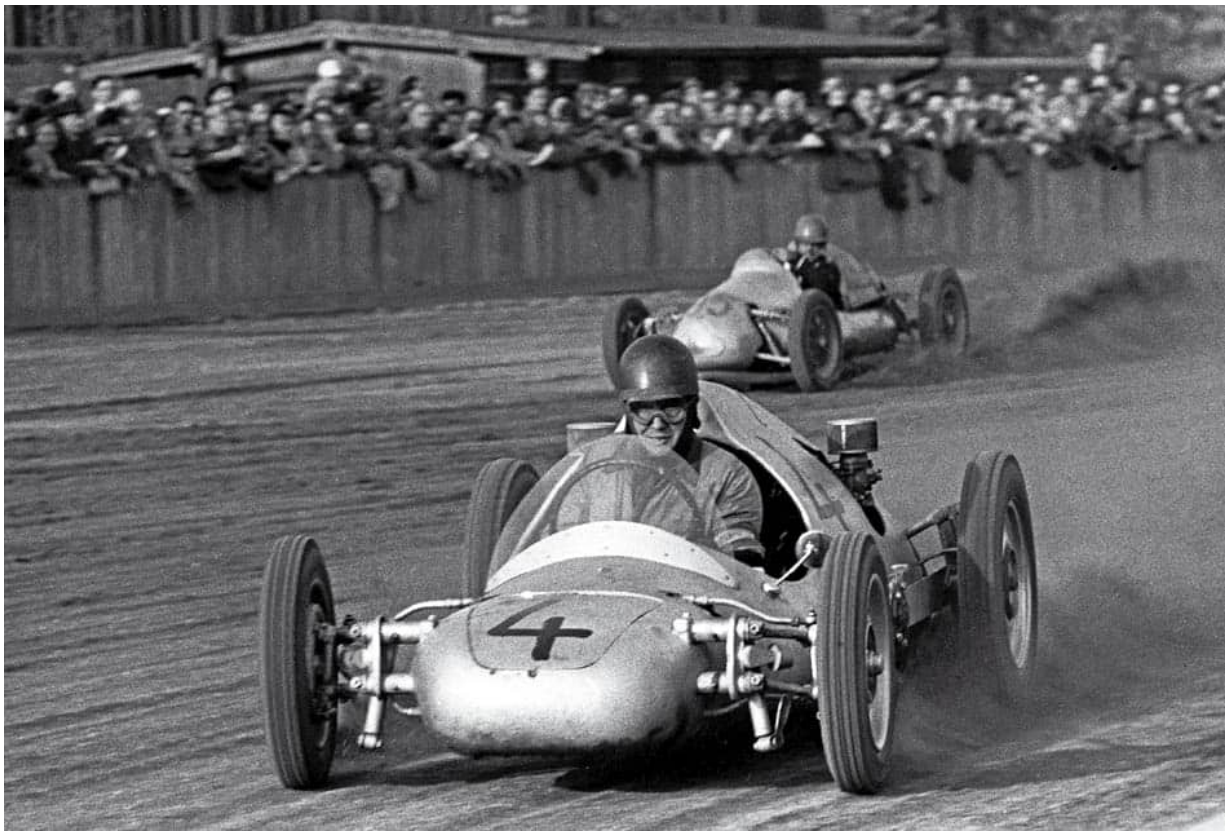
Otto Mathé, born in 1907, trained as a mechanical engineer. He was also a motorcycle racer. During his racing days, he recognised the wear and loss of power that was caused by friction in engines and on chains, etc, on his bikes. It could be said he was ahead of his time, because he created a product called 'Mathé Universal' – an additive for engine oil (lubricant additive) decades before the famous STP lubricant additive was created in 1954. He was very successful with 'Mathé Universal,' especially as it met with the approval of the German automotive specialists. Today, Mathé-Schmierstofftechnik GmbH is an international lubricants company. In 1934 a serious accident caused the loss of part of his right arm; his career as a motorcycle racer was over. After the war, Mathé set up a cylinder boring and crank grinding business in Austria. Having ceased motorcycling, he became a keen car racer and it is recorded that he acquired a Type 64 Porsche, in fact the famous Berlin-Rome-Berlin car. He drove this car to 23rd overall in the Coppa d'Oro delle Dolomiti in 1949. He went on to race the car eight times more, finishing 4th in a race at Liefering in May 1952, and taking a victory there in the Type 64 at the September race meeting. He was also a prolific driver of the then-new 356, taking four victories and numerous

podium positions. His knowledge of the Porsche engines was extensive, and he built the single-seater (seen on the right), now in the Automobile Prototype Museum in Hamburg.

Mathé's self-designed and -built 'Rag Flyer' was well known to Huschke von Hanstein and Richard von Frankenberg (see Chapter 2). It is said that in 1952 Otto Mathé drove in 20 car races, winning many – driving with one arm!



The Type 114 would rise from the drawing board with a streamlined aluminium body, the whole being described as the Type 64. Here we see what is thought to be the Austrian Otto Mathé with the only surviving example (of three that were originally built), racing in June 1952. (P)



Baden, Germany, loose surface racing in 1955: the amazing little Mathé-created car in action. It is understood at the time of writing to be residing in the Hamburg Prototype Museum in Germany. (P)

Krieau Hillclimb in Austria 1953: Otto Mathé in full flight. (P)

The Mathé 'Rag Flyer,' far left, at the start of an ice-race meeting in the 1950s; a close look will reveal studded tyres. (P)

♦ ♦ ♦ ♦ ♦

Monteverdi-Porsche

The Monteverdi-Porsche was one of the early designs to come out of Peter Monteverdi's Basel design and construction business in Switzerland. It was his second effort at design and build, the first having been a rear-engined Formula Junior car; it was powered by a two-stroke DKW engine. The company was then called MBM, the first M being for Monteverdi, B for Basel, and the second M for Mantzel, reported to be Dr Mantzel, an engine tuner who was tuning the DKWs planned for a run of Monteverdis. It didn't really take off, even though they tried to sell the MBM DKWs in the USA, where it is said they were called the Machan.

Within a year of the Mantzel association with Monteverdi, however,

the two men had an argument, and Mantzel departed. Then another M arrived – one Gerhard Mitter, who at that time was selling two-stroke Formula Junior engines, and was on his way up as one of the great Porsche drivers over the next few years, until his untimely death whilst practising for the German Formula 1 Grand Prix in 1969. Mitter would find little time to become involved deeply with Monteverdi, who set out on his own to build the cars, moving to Binningen, a Basel suburb. The date was 1961: Monteverdi Binningen Motors was the new name but neither the initials nor anything else needed to change.

Monteverdi wanted to move forward, and the same year built his second project, based on the chassis of the Formula Junior car, but this time with a 1.5-litre engine to suit the new F1 regulations of the time. Although we cannot be sure, the engine is thought to have been similar to that being used in the then-current model 718 RSK Porsche, which first appeared in 1958. By 1961 the engine in the 1960/61 RSK 718 model RS 60 and RS 61 was a Fuhrmann twin-cam 'Carrera' unit. But the story goes (though the author has not been able to verify this) that Porsche was unwilling to sell a factory engine to the young Monteverdi. Monteverdi was not to be outdone and bought an RSK, taking the 150+bhp engine from it to fit into his latest creation.

Monteverdi entered the Solitude Grand Prix, due to run on 23 July 1961. He started at the back of the grid in 17th; however, after running near the back of the field Monteverdi failed to finish. He had planned to race at the German Grand Prix, but at a Formula Libre race at Hockenheim he suffered an accident that would put an end to his racing career. He would later achieve the fame and success he might have been seeking as a race driver, when in 1967 he launched to the motoring press the first of a line of exotic road sports cars that are much sought after today. These, though, were not Porsche powered.

The MBM-Monteverdi; the car seen here is thought to be powered by an engine other than Porsche, and is the Formula Junior earlier model, though this vehicle sports wheels of a pattern similar to the Porsche 356. (P)

Peter Monteverdi with the MBM single-seater; the engine looks very much like a Fuhrmann Carrera unit as used in the RSK 718 RS 60-61 at that time. The photo is at the Solitude race track, 23 July 1961, for the Solitude Grand Prix. (P)

The MBM in the pits: Peter Monteverdi stands looking at the car whilst talking with a gentleman in dark glasses. Unfortunately, we have not been able to identify who the other persons are. (P)

Balsa-Porsche

Marcel Lucien Balsa was born in Saint-Frion, France, in 1909. As a young man he was a good boxer, and even boxed at the Palais des Sports in Paris, it is said, on the evening of his marriage! He is recorded as saying: “I won on a KO (knock-out), doubtless because I was in a hurry …” A broken hand cut short his career as professional middleweight boxer, and he became an ace motorcycle rider, winning a French Championship in 1937 on a Norton. From two wheels Balsa moved on to four, making a brilliant debut at Pau, where at the wheel of his Bugatti No 30, a Type 35B, Marcel Balsa qualified on the 3rd row of the grid in 8th position of the 16-car field, the Mercedes of Lang, Caracciola and von Brauchitsch locking out the front row. A

report of the race states: “Balsa was making a good job in his old Bugatti to keep the whole lot of Delahayes behind him.” On the 22nd lap, Balsa’s good race came to an end. The date of this race was 2 April 1939; six months later the world was at war. Marcel Balsa survived, and on 9 September 1945 took part in the first races to be held in postwar Paris; in the Coupe de Paris he was 3rd in a Bugatti Type 51.

Balsa continued to compete, winning the 1953 Coupe d’Automne 2-litre class at Montlhéry. He took several class victories until an accident at Montlhéry forced him to give up. He is recorded as saying: “Mechanics and racing are my passions. Since I’m now too old to drive, I’m going to build a car for a young Frenchman to drive.” His single-seater was much in the same vein as Otto Mathé, but was not as successful. The Balsa-Porsche has recently been rediscovered, and is undergoing restoration in Switzerland by a Swiss enthusiast who passed these details to the author.

A newspaper article from 1962 says: “Balsa announces that his F1 car is almost finished. He has been working on this single-seater for more than a year in his garage at Maisons-Alfort, Arthur-Dalidet street. It has a Porsche Carrera 1500 engine modified to RSK spec, a molybdenum chassis of his own design, a ZF gearbox, two brake circuits, dry sump, and suspension system derived from that of the Porsche. Weight is around 500kg. Even the steering wheel has been created by Balsa with a duraluminium mounting and a wheel made of cork.” Fast forward to recent times and the car is now running, thanks to Jean-François Jordan.

Marcel Balsa passed away in 1984, but his creation lives on, discovered and restored by Swiss enthusiast Jean-François Jordan: the Balsa-Porsche seen here at Montlhéry in 2015. (JFJ)

♦ ♦ ♦ ♦ ♦

Bettenhausen Midget-Porsche

Midget racing has been for many years, and still is, a big deal in the USA, and it was back in 1975 that one Gary Bettenhausen took to the dirt track in a Porsche powered midget racer.

Gary was the son of a famous US racer, Tony Bettenhausen, and he took to racing the Midgets as did his brothers, Tony Jr and Merle, Gary becoming a champion in the process. In an article in a news magazine (author's note: unfortunately we do not know the name to credit: the article came to me with no indication as to its source, only that it was written in 1976), the following information was given on the Bettenhausen-Porsche story:

“It is only in recent months that the Midget auto contingent has discovered the air-cooled six-cylinder from Stuttgart. In the United States Auto Club’s Midget division, Gary Bettenhausen, well-known for his Indy exploits, has utilised the 2.2-litre version of the familiar flat-six in his latest racer. Midgets, just to set the record straight, are slightly scaled-down sprint cars – circle track machines that look like racing cars of the 1940s. That means the engine is in front, the centre of gravity is relatively high, and the overall mechanical layout is simple. Both sprinters and Midgets use direct drive (the engine is hooked to the driveshaft through a simple in-out coupling), and with no clutch or gearbox the cars must be push-started. But once under way, the machines accelerate briskly because, amongst other things, their engines have no flywheels.”

Gary Bettenhausen in his Porsche-powered Midget racer at the Indiana State Fairground’s one-mile dirt track in Indianapolis, 16 May 1975. (PR)

Midgets and sprint cars race on an oval track – dirt or paved. While the larger sprints prefer a ½-mile long circuit, Midgets are at home on both ½- and ¼-mile ovals and even on an ⅛-mile track. Both the

larger and smaller racers exceed 100mph on the straights of the longer tracks. Ford V-8s and Offenhausers were frequently used for power. In the early 1970s one Larry Caruthers debuted a Volkswagen-powered Midget. The engine's low weight and centre of gravity made it a natural for the tiny racers. Its air cooling meant that there was no need for extensive plumbing and a water radiator (a heavy-duty oil cooler and sump were required). An early VW Midget began to win and Bettenhausen tried a VW. But it was found not to be powerful enough. So the brothers Gary and Merle decided to construct in their Indianapolis workshop a Porsche-powered Midget, using a Porsche 2.2-litre sohc six. USAC regulations stipulate that single overhead-cam engines used in Midgets must displace no more than 2276cc.

The article continued: "The Bettenhausens modified the Porsche for Midget use by replacing the Bosch continuous-flow fuel-injection with a Hilborn unit that was standard throughout the class. The Hilborn is designed to flow methanol, the fuel used in Midgets. Although no specific horsepower figures were derived, the race-tuned Porsche Midget motor was said to develop in excess of 200bhp. After a few months of teething problems, the tubular framed racer found its proper stride, and as the 1976 USAC Midget season began, the Porsche-powered machine was on its way to a string of victories."

Bettenhausen would race the Porsche-powered car on several occasions; it seems it won on three. The first engine in the car was a 911E unit on Hilborn injection in 1975. It was then replaced with a 906 – so says Paul Ross who built the engines. He told the author: "The competition complained so much we went down from 2.2 to a 2.0 and used the 906 engine. It was almost unbeatable with Gary driving. USAC was not happy and banned the Porsche shortly after." Paul says: "The 1974-75. The first engine was a 1971 911E #6210717 Type 911/01. The team was forced by the USAC decision to return to USA home-built engines after that." Interestingly that engine was for sale during the time of research for this book.

♦ ♦ ♦ ♦ ♦

Behra-Porsche

During the late 1950s, Porsche started experimenting with a single-seater F2 car, created by utilising parts from the RSK sports cars. Used initially for hillclimbs, the car showed great promise. At the time, Jean Behra drove on several occasions a Works-supported RSK 718, whilst having a torrid time with Ferrari in F1. Behra had an idea to create his own car, principally for F2 but with F1 in mind. Porsche was in on the idea and gave help to engineer Valero Colotti (he of the Colotti gearbox), who was to design the car, along with Giorgio Neri. It was a proper mid-engine single-seater instead of a modified RSK. Still making extensive use of RSK parts, which were plentiful then, including the suspension on all corners, and the RSK gearbox. The engine was a Porsche Type 547/3. Officially designated a type 550-032, the Behra-Porsche was designed during 1958; it was to have a new light tube-frame chassis and a less bulbous aluminium body than that of the previous year's works Porsche F2s that were initially based on modified 718s.

On 10 May 1959, at the Monaco Grand Prix, Behra, at the time contracted to Ferrari, took second fastest time in his 246 Dino Ferrari, ahead of Wolfgang von Trips in one of the 'Werks' F2 Porsches in practice. In the race he led at the start, but was eventually to go out with engine failure. It was at this race that the Behra-Porsche appeared, in practice.

Monaco, 10 May 1959: Maria Teresa de Filippis, driving the very recently completed, still unpainted Behra-Porsche in practice for the Monaco Grand Prix, that year a joint F1/F2 event. Unfortunately the car failed to qualify. (P)

The new Behra-Porsche, as yet unpainted, was the No 4 car, in the hands of Maria Teresa de Filippis, a 32-year-old Italian driver. She was, though, unable to qualify the Behra-Porsche for the main event. Behra was not concerned: for him it was a shakedown, under race weekend conditions. There were also plans now to build a second car. At Pau a few weeks later, Behra, due to some twists and turns over contracting, found himself able to drive the new Behra-Porsche #28 himself, and he put it on the front row of the 20-car grid between

the Coopers of Maurice Trintignant (on pole) and Bruce McLaren. In the race he was running in 3rd and moved up to 2nd on lap 2. On the third lap, with rain beginning to fall, he was going for the lead when he misjudged the conditions and spun at the Parc Beaumont corner, hitting the straw bales lining the course. The left rear tyre deflated and the bodywork was damaged. He managed to get the car going again to reach his pit, where, due to the damage, the delay was nearly two minutes. He re-entered the race, and, with the inspired driving that was his trademark, he climbed back up the field to 7th by the 40th lap. Trintignant was leading the race; the rain came down harder. Behra still pressed on, up to 5th place by lap 54. Going for 4th at the Tribune corner, he spun again, ending up in the straw further on at Station Corner. A gendarme pushed the car back the right way round. Forbidden, but this is France, and it was a French driver – no one was looking! Behra set off again, furious at his own mistake. He ended the race 5th, but the potential of the Behra-Porsche was proven.

On 5 July 1959, at the III Coupe Internationale de Vitesse at Reims, Behra had entered Hans Herrmann in the Behra-Porsche. Herrmann (car 46) rewarded Behra with a 2nd place overall, the victor being Stirling Moss in his Cooper T45–Borgward. A week later, on 12 July, Behra was in Rouen for the VII Grand Prix de Rouen-les-Essarts. Again he entered the F2 Behra-Porsche for Hans Herrmann. Stirling Moss set an extraordinary practice time of 2min 21sec (faster than the F1s in 1957) in his Cooper fitted with a Borgward engine. Bizarrely, the organisers annulled his time, on the pretext that the “official chronometers were inaccurate.” It was therefore Herrmann’s Behra-Porsche which took pole position. In the race, Herrmann broke his clutch on the 8th lap.

The Behra-Porsche of Hans Herrmann (46) and the Cooper-Borgward (8) of Stirling Moss, toe to toe at the III Coupe Internationale de Vitesse, Circuit de Reims-Gueux, France, 1959. (P)

Reims 1959: The Behra-Porsche, powered by the Type 719 engine, driven by Hans Herrmann, finishes 2nd overall to the great Stirling Moss in a Cooper-Borgward. (P)

26 July saw Behra at the Charade Circuit in the Auvergne, to race first in the 2 Hours of the Auvergne, and then in the F2 Grand Prix. The Behra-Porsche, with Behra himself at the wheel, was 4th fastest in practice in the Grand Prix behind Moss, Hill and Bristow. A slow start saw him 7th after the 1st lap, but he was up to 2nd on the 4th lap, with only Moss ahead, when on lap 13 a hose let go and he was forced to stop for ten minutes for repairs. He finished 12th, on 25 laps. He had taken the lap record, but Moss retook it before the end. It was the last time Behra would drive the car.

Entered with it for the Avusring F2 race, he was to drive his RSK 718 sports car in a support race on the programme before that race. That 1 August Grand Prix weekend was sadly to be his last race; he died at the wheel of the RSK, when the car went out of control on a wet circuit and Behra was thrown from the car, hitting a flag pole and

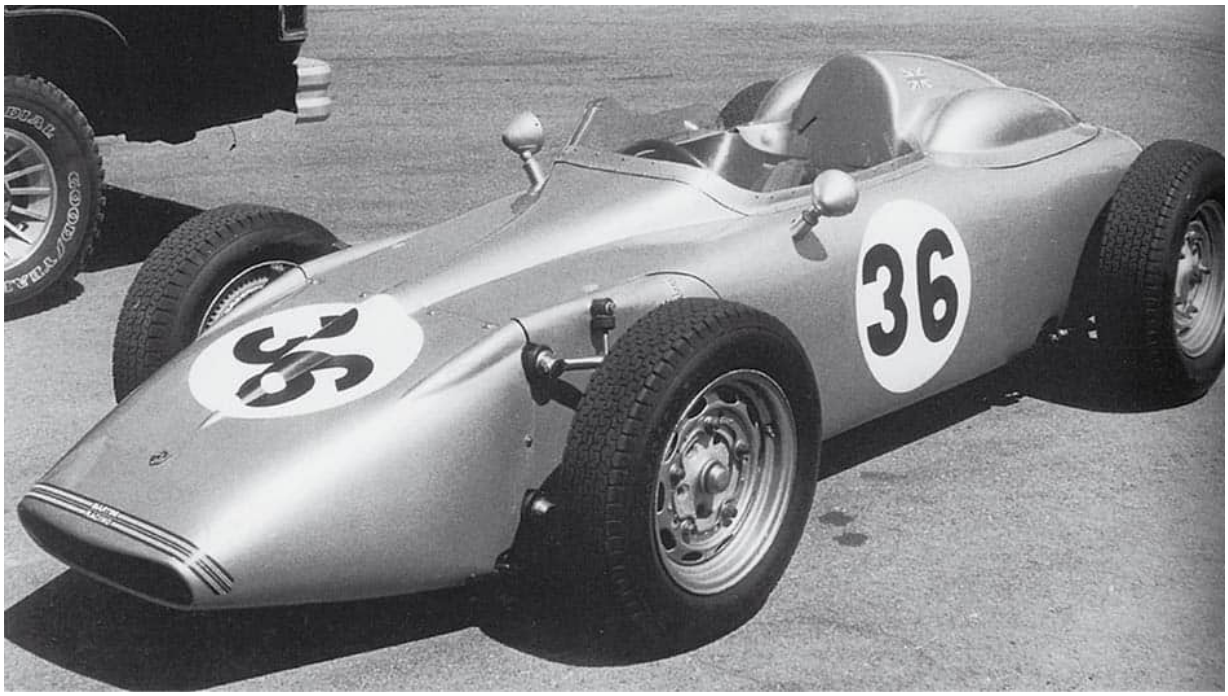
suffering head injuries. The Ecurie Behra was closed.

Shortly afterwards, American journalist Fred K Gamble, along with another American driver known as ‘Lucky’ Casner, and several amateur racing friends, calling themselves Camoradi Racing (Casner Motor Racing Division) became America’s first industry-sponsored racing team. While in Europe in 1959, Casner had formed an association with Porsche’s Huschke von Hanstein. This contact led to Casner buying two Behra-Porsches from the late Jean Behra’s estate.

On 7 February 1960, Masten Gregory was entered in the Behra-Porsche in the Argentine Grand Prix. Gregory put the blue car in 6th on the grid. He finished 12th. At Chimay, in the Belgian Grand Prix of the Frontiers on 5 June 1960, Hans Herrmann qualified the Camoradi car on the front row, but results show he finally went out with gearbox failure. Herrmann is recorded as saying: “The car had been well designed, but had been given no development because of Behra’s death – a pity, as the potential was there.”

However, at the Italian Grand Prix in the September at Monza, qualifying on the back on the grid was Fred Gamble, entered under the Camoradi banner; it is said he had entered under the name of Frederico Gambini! This was the race that the F1 teams chose to boycott due to the condition of the Monza track. Left with a tiny grid, the Italian organisers opened up the event to Formula 2 cars, offering tempting start prizes. The F1 cars needed to refuel at some time during the race, but the Fred Gamble team, being run by Valerio Colotti, the Behra-Porsche designer, and Giorgio Neri, were convinced that they would not need to stop. In order to achieve this, Fred Gamble decided to reduce his maximum revs by 500rpm. For a long time, he held 8th place and 1st of the F2s, but in the end Gamble did have to stop to refuel. He lost a lot of time and eventually finished 11th, nine laps behind the winner! Some years later, the Porsche-Behra was acquired by the Collier Collection in Naples, Florida, where it remains today.

Date	Event	Circuit	Race no	Car	Driver	Entrant
10/5/59	GP Monaco	Monte Carlo	4	Behra	M-T de Filippis	J Behra dnq
18/5/59	GP Pau	Pau	28	Behra	Jean Behra	J Behra 5th
5/7/59	Coupe de Vitesse F2	Reims	46	Behra	Hans Herrmann	J Behra 2nd
12/7/59	GP Rouen	Rouen	8	Behra	Hans Herrmann	J Behra dnf
26/7/59	Trophée d'Auvergne	Charade	28	Behra	Jean Behra	J Behra 12th
2/8/59	GP v Deutschland	AVUS	12	Behra	Jean Behra	J Behra Behra deceased
6/2/60	GP Argentina	Buenos Aires	2	Behra	Masten Gregory	Camoradi USA 12th
14/2/60	GP Buenos Aires	Cordoba	2	Behra	Masten Gregory	Camoradi USA dnf
30/4/60	BARC 200	Aintree	8	Behra	Masten Gregory	Scudería Centro Sud dnf
5/6/60	GP des Frontières	Chimay	12	Behra	Hans Herrmann	Camoradi USA dnf
4/9/60	GP Italia	Monza	28	Behra	Fred Gamble	Camoradi USA 10th-6th F2



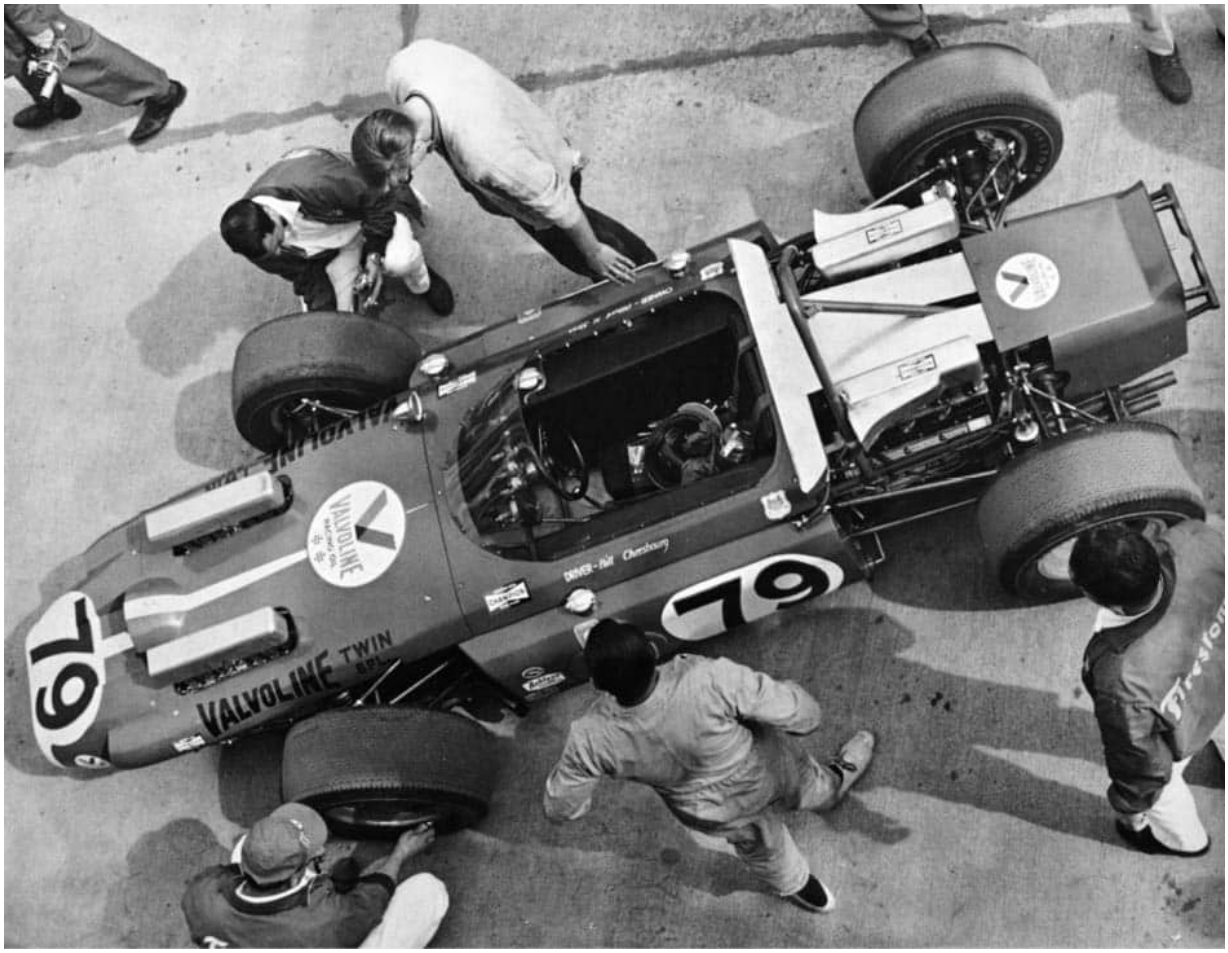
The Behra-Porsche, 1959, 1498cc quad-cam Carrera engine, 150bhp, weighing in at 470kg. (P)

Stein-Porsche Brickyard Special

As Jürgen Barth says in his book, written along with Lothar Boschen in 1984, Porsche as a factory team had taken part in most forms of motorsport, but in the time period concerned had not tried the

Indianapolis 500. However, as we see here, others did. We use the term others, because this was not the first attempt with a Porsche engine. Back in 1964 the aforementioned Lou Fageol, the American industrialist (see Chapter 2), built a twin 356-engined race car to enter the Indianapolis 500. That car didn't make it, but his earlier efforts with a twin-engine Meyer Drake actually got on the front row of the grid for the famous race in 1946.

Albert H Stein's attempt in 1964 was also a brave attempt and worthy of mention here. Stein had started planning his effort in 1963. Originally he planned to use locally built engines, but a year or so later in Germany, when a friend offered him three of the then-new 911 (901 Type) engines at a good price, he snapped them up. Racing car tube-frame constructor Joe Huffaker was asked to build the chassis to take an engine in the front and an engine in the back. Huffaker Engineering had been established in 1960 (see also the story of the Sabel car in Chapter 3), and specialised in the design and development of racing cars and engines, initially Jaguars and MGs. He was to create several mid-engine models, including a mid-engine sports racing car named 'Genie,' as well as several Indianapolis Specials. Stein fabricated the aluminium body that encased the tube frame, into which was installed an engine with a Lancia racing gearbox attached ahead of the driver. The rear engine was installed as in a mid-engine car, with its gearbox at the back. Each engine drove its own set of wheels. The gearboxes had to be turned to ensure that they would drive in the same direction! The engines were synchronised by a series of complex connections. It is said that the front engine could be shut down, and the car run with just the rear engine if necessary. The Brickyard Special turned up at the qualifying day in May 1966, where Bill Cheesbourg drove it in qualification. However the car turned out to be just too slow, with a qualifying run of just 149mph (240km/h).



Twin 911 engines gave a lot of power, but just not fast enough:149mph (240km/h) against Mario Andretti's pole-sitting car with 166.3mph. (JB)

On Friday 13 May, the final day of practice before time trials, Mario Andretti shattered the unofficial track record by more than 5mph, running a lap of 167.411mph. The next-fastest car was Jim Clark, whose best lap was 165.7mph. On qualifying day, Mario Andretti took pole position with a four-lap track record of 165.889mph. His best single lap was a record 166.328 mph. Cheesbourg, who had finished 10th in the 1958 Indy 500, just could not get the twin-engine car anywhere near the slowest qualifier, which was 158.646mph. After this attempt, deflated at not qualifying, Stein tried to sell the car for just one dollar! But he got no takers and the car just disappeared.

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Interscope-Porsche, Indianapolis car ‘1’

Hans Mezger told the author: “I had first got involved with single-seater race cars in the 1960s. Mr Hörnig was the man charged with looking at the F1, and so in the beginning I helped to design chassis, suspensions also, so for me it was very interesting because I was learning everything that I wanted to do in Porsche. The six-cylinder engine had been started in the production design department. They started with the Type 745, but the engine was not so modern. A lot of things were discussed, and even though we were in the racing-orientated department, the company at that time was so small that everybody knew everything, so every day we talked about the production engine, and very soon there were also discussions with Ferry Porsche about what Porsche should have for the future. We raced in F1 in 1962, but Ferry was not an F1 fan at the time. He was a sports car man, so that’s why he said we should make an eight-cylinder engine that must be usable for the long-distance races as well as F1. We designed and made a 2-litre engine and also, later on, we made an eight-cylinder 2.2-litre.

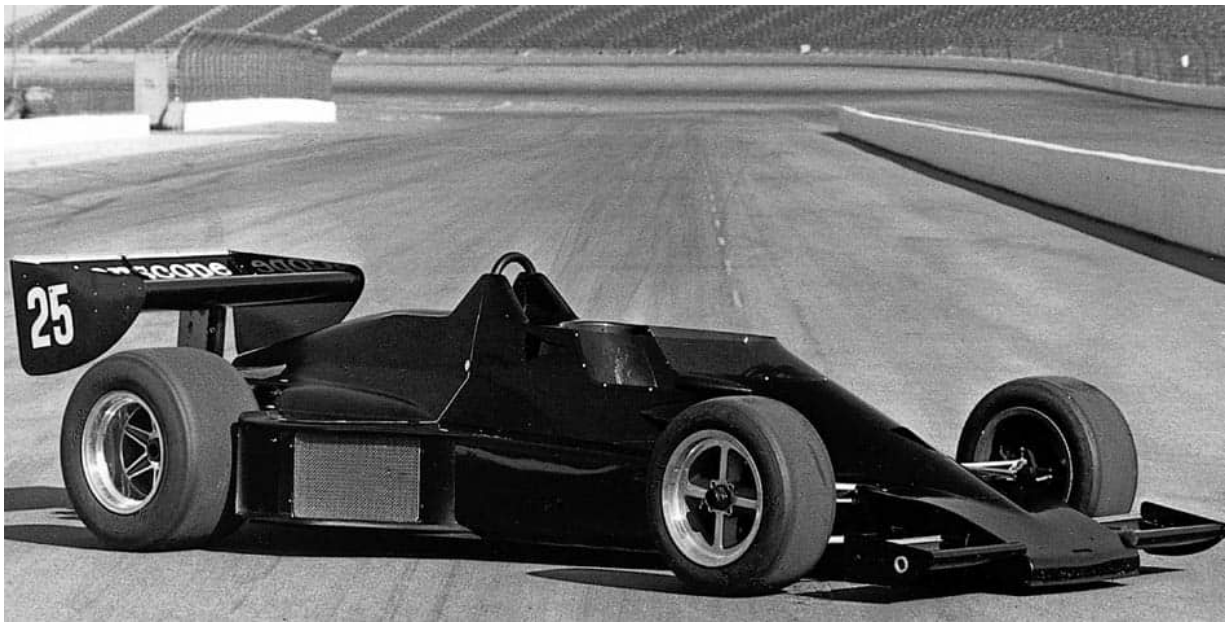
“The F1 project was stopped by Ferry at the end of 1962. Mr Hörnig left the company, so in 1963 there were only three of us including me. Mr Piëch was in control of designing race cars, when Ferry Porsche asked that the people from the F1 team should help the development of the six-cylinder, because he knew that they needed some help. This was for me a very good time to work together with the new engine team: coming from racing we had some ideas and changed many things. The main change was to have a dry sump, which the previous engines didn’t have. I remember that we already had some cornering problems with the 356 cars and engines. In the single-seater racing engines we had a dry sump from the beginning. For the casings we used magnesium for racing and aluminium for the production engines.

“In the 1970s, I had designed a 4.2-litre engine that could be used at Indianapolis – I did the layout from the experience we had from the F1 and the production engines. But nothing happened until 1977,

when we were asked to look at it again and Valentin Schaeffer started the planning."

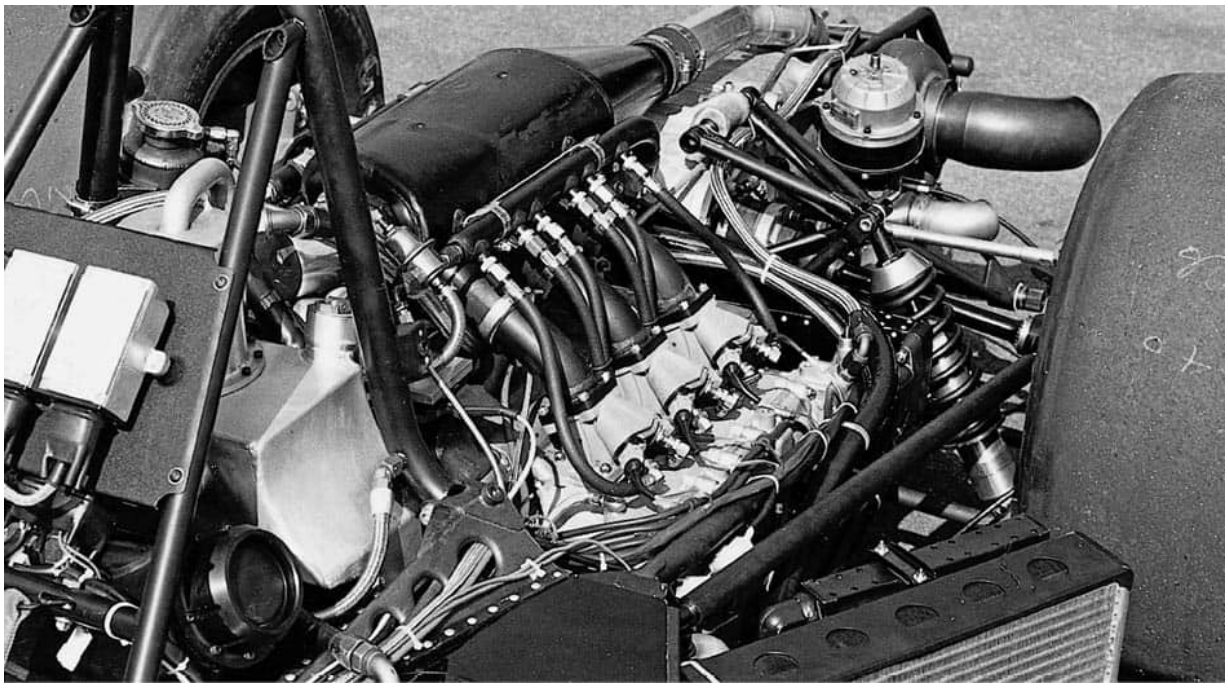
Valentin Schaeffer told the author: "We had to be very secretive about it. Mr Flegl, who had been involved with the CanAm cars a few years before, was in charge of the project. We were to prepare an engine for a car to race at Indianapolis."

Valentin Schaeffer had become something of an expert with turbochargers in the earlier part of the 1970s and, of course, the CanAm cars were awesome in their performance where the turbo was king. In the USA, Jo Hoppen, then Porsche North America Motorsports Manager, had arranged for Helmut Flegl and Racing Manager Manfred Jantke to visit Indianapolis to take a look. They had seen Tom Sneva qualify for that year's race (1977) at a speed of 198.88mph. The US market for Porsche was huge; the Indy 500 was huge; the attraction was obvious.

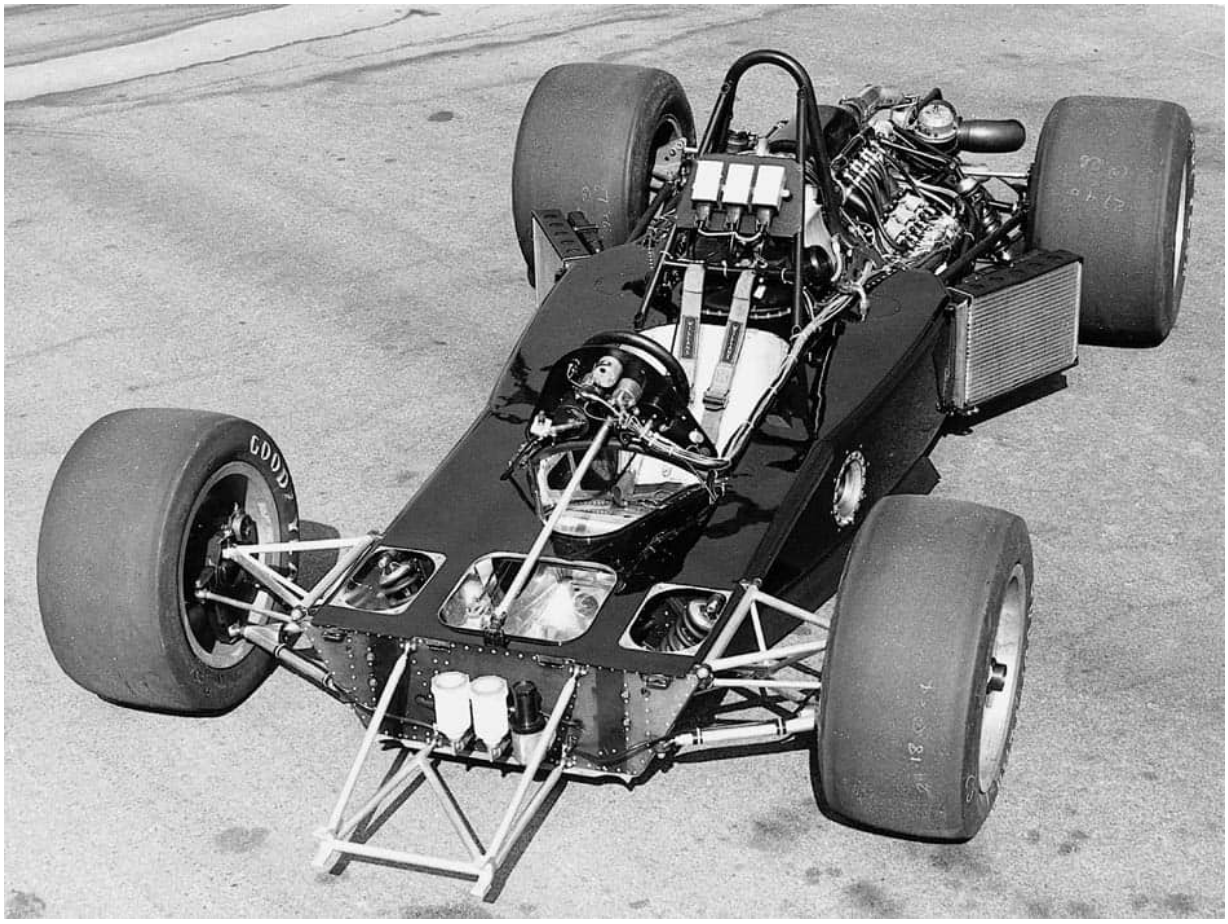


Interscope Racing, owned by Ted Field, would be major players in the first attempt by Porsche to run at the Indianapolis 500. Here we see the Jim Chapman/John Barnard version of Vel's Parnelli Jones Indy Car, created for Porsche, first sight roll-out. (P)

L to R: Valentin Schaeffer, Jim Chapman and Vasek Polak enjoying a joke during early testing in 1979 at the Ontario Motor Speedway. (JC)



The Porsche engine installation in 1979. (P)



The John Barnard-modified Parnelli Jones chassis, 1979. (P)

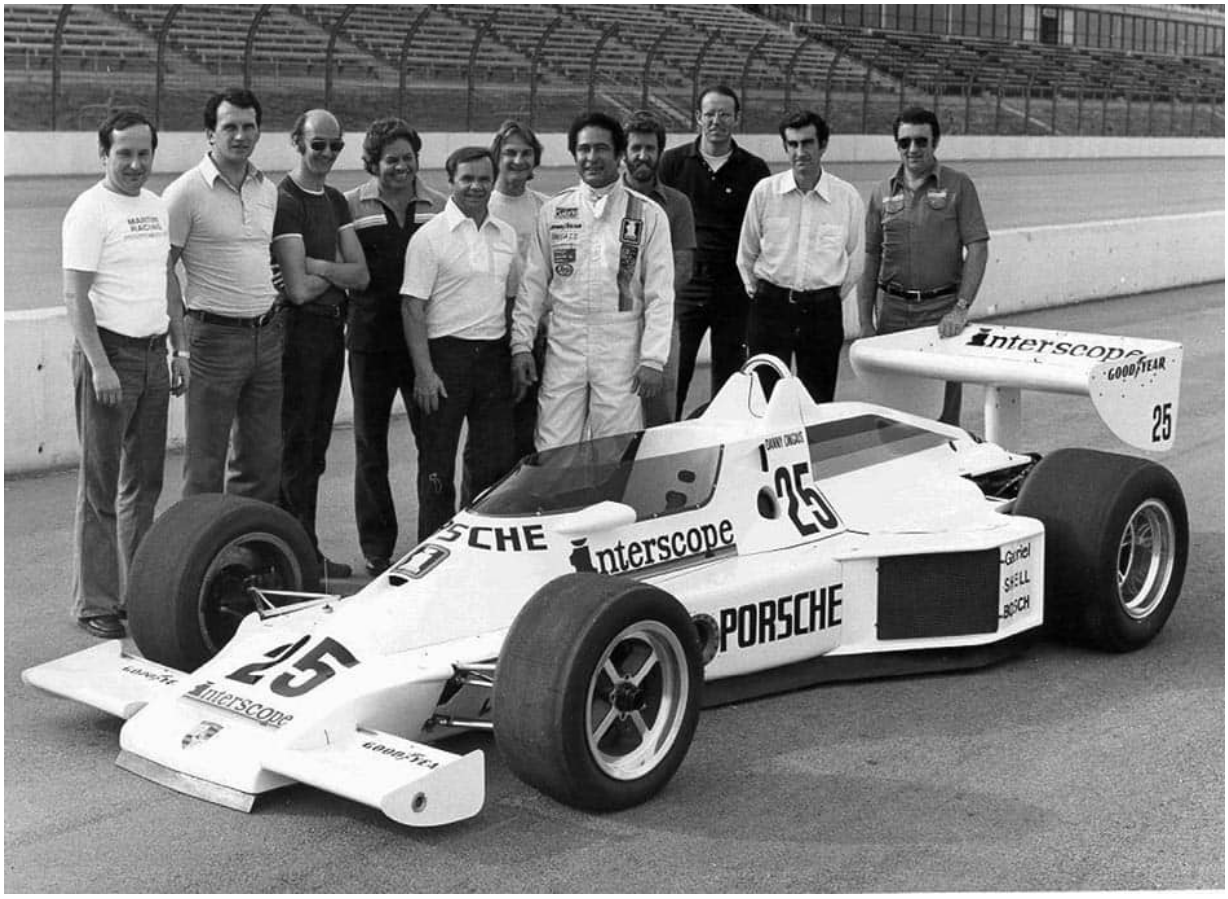
Porsche's old friend Roger Penske became involved while the engine was being prepared by Valentin Schaeffer in Germany. Of course, Porsche and Penske went back to the CanAm days. Penske was also an Indy expert, having raced his team there since 1969; his driver Mark Donohue was rookie of the year in that 500 race. Penske had been in contact with Schaeffer about the performance required to run at Indy. Not only that, but he was to supply technical info and performance details of the Offenhauser Indy engines, then popular at the Indy 500. A meeting in Weissach chaired by Ernst Fuhrmann, a week after Porsche had won at the 1977 Le Mans, set out the plans to be executed. The engine chosen was the 935 2.8-litre. Running on methanol, December tests showed that Schaeffer was getting nearly 900bhp out of it. Things were looking good. Tests continued into March 1978. Then the press got wind of the fact that Porsche was

planning to tackle the Indy 500.

Porsche USA highly respected dealer and racing man, Vasek Polak, who was at the time an advisor to the Ted Field Interscope Team, along with Jo Hoppen, helped to arrange for the early Porsche engine tests to be converted into a serious attempt. American chassis man Jim Chapman told the author: “A Vel’s Parnelli Jones chassis was to be used to evaluate the Porsche plan. Car designer Maurice Philippe, assisted by John Baldwin, had created an F1 car for Mario Andretti. After the F1 design came the Indy car version based on the same chassis, but with significant design changes to comply with the United States Auto Club rules. At the end of their contracts, Maurice and John had departed Vel’s Parnelli Jones Racing to return to the UK, to be nearer the F1 businesses. I hired John Barnard to be chief design engineer for Vel’s Parnelli Jones, to redesign the existing chassis/car rather than a new, clean sheet of paper, designed car. A Barnard version of Vel’s Parnelli Jones Indy car was purchased by Interscope Racing Team to be converted into the test car for the Porsche Indy engine programme. Interscope was the team owned by Porsche racer and chain store heir, Ted Field. The Vel’s Parnelli Jones-Porsche test car conversion design was my responsibility.”

18 October 1978 had seen Porsche development boss Helmuth Bott press the ‘go’ button, during a meeting with Helmut Flegl and Manfred Jantke, to go ahead with development. In December 1978 an engine was shipped to go into the Jim Chapman-managed chassis programme. Into 1979, Valentin Schaeffer made several visits to California to ensure that the Porsche side of things was going okay, and preparations were made to get the final engine ready to go into the car. In July 1979 the first of the final engines was ready to go. In Weissach it had shown 904bhp at 8800rpm on a single turbo, using Kugelfischer mechanical injection. Valentin Schaeffer installed it in the car.

At the same time, Ted Field had said Interscope would build a new car for the 1980 Indy 500, which was to be designed by Roman Slobodynskyj at Interscope Racing Team’s facility in Santa Ana. Track tests with the test car began, and, at the Ontario Motor Speedway in October 1979, Danny Ongais ran a lap of 197.1mph.



Interscope Racing – Martin ?, Helmut Flegl, John Saunders-Hyde, Phil Casey, Valentin Schaeffer, Danny Thompson, driver Danny Ongais, Mike Donavan, Jimmie Nielson, Jim Chapman, Ule Peterson. (P)

It was looking good, but storm clouds were forming. CART (the Championship Auto Racing Teams) was getting bad signals from the USAC governing body, relating to a reduction in allowable boost pressure on the Cosworths that were being used by the top teams. They were threatening the life of the US home-grown Offenhausers that were cheaper to run. USAC requested engine detail and boost information; because the Porsche engine was a flat-six-cylinder, no one knew how powerful this engine might be. There was a lot of misinformation flying around, and documents and drawings never reached the USAC authorities. Even so, USAC agreed to set a boost point that was acceptable to Porsche.

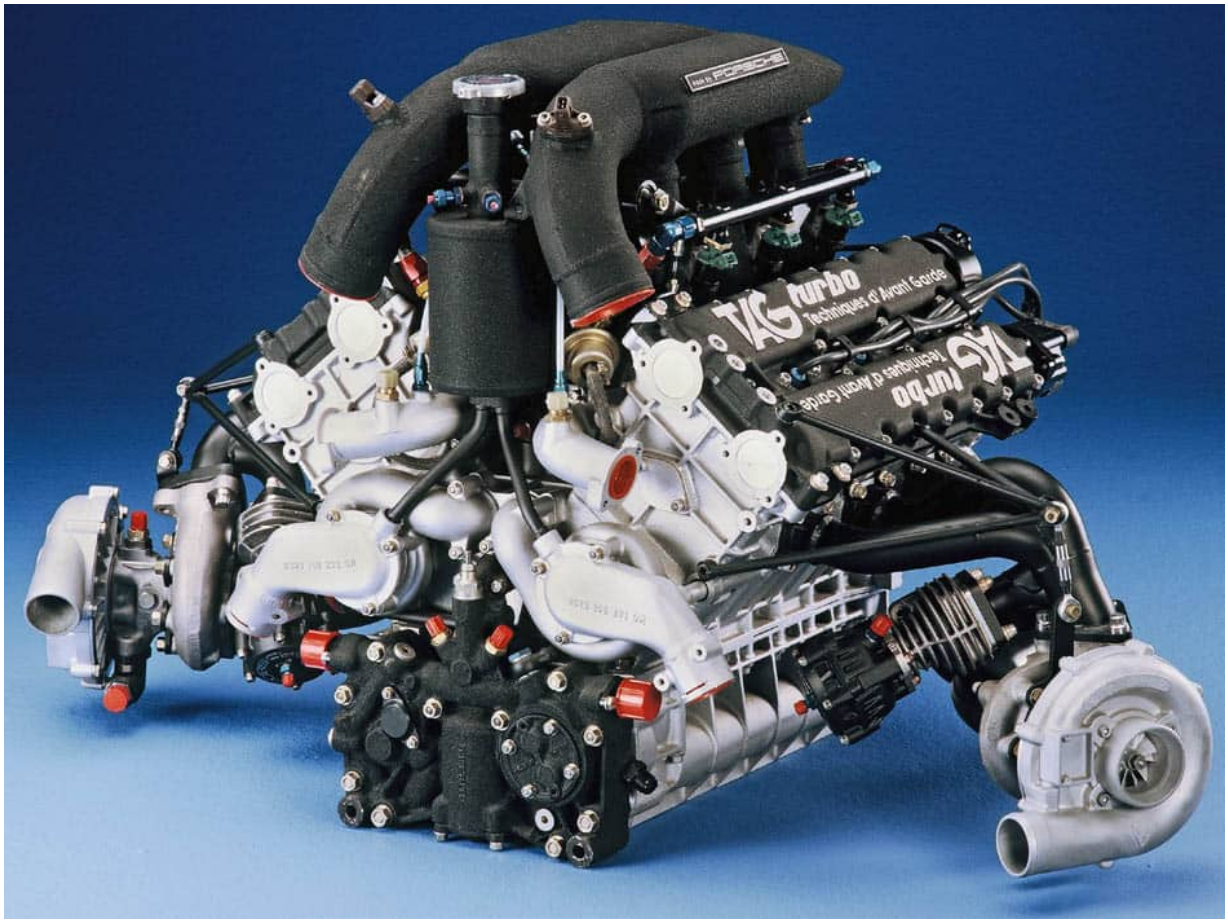
Tests were proving very positive and certain members of USAC

started to get nervous: all knew that once Porsche got a foothold it may well dominate things. USAC sent an ‘expert’ to Porsche to examine the engine in Weissach. The expert turned out to be AJ Foyt’s key engine man and crew chief. It seems tensions were also growing with Interscope over the new car design. Porsche felt it did not reflect the latest aero technology. Danny Ongais did more testing as the clock was ticking. USAC was not satisfied; it requested that the fixed boost already agreed be reduced. Porsche was not happy. Compromises were sought and procrastinating talks took place. In the end, the car did not race at the Indy 500 in 1980. Porsche, though, had learnt a lot and discovered that the technical potential of the engine was such that it was worth pursuing, maybe for uses other than Indianapolis. A short-stroke version was created, called the 935/72; it worked, and was to be a race winner at Le Mans in 1981 in the ‘Jules’ 936. Porsche decided to cancel the Indy car project – the great adventure to race at the Indianapolis 500 had come to an end. Or had it? We will see.

♦ ♦ ♦ ♦ ♦

McLaren-TAG Porsche Formula 1

In the mid-1970s, Renault had started exploring the development potential of a turbocharged engine for Formula 1. Porsche had been using turbochargers in CanAm. In Indy car racing, forced induction had been around for a long time, and now Renault was looking at the F1 rule book. The rules, which had changed in 1966, were written to allow 3-litre normally-aspirated engines or 1500cc boosted engines. But by ‘boost’ everyone thought ‘supercharged,’ and supercharging was not the route that most teams chose. As the ubiquitous normally-aspirated Cosworth DFV 3-litre V8 became the engine that gave the best results, most teams used them, except for Ferrari, Matra and Alfa Romeo, all of whom produced their own engines, all in the 3-litre format.

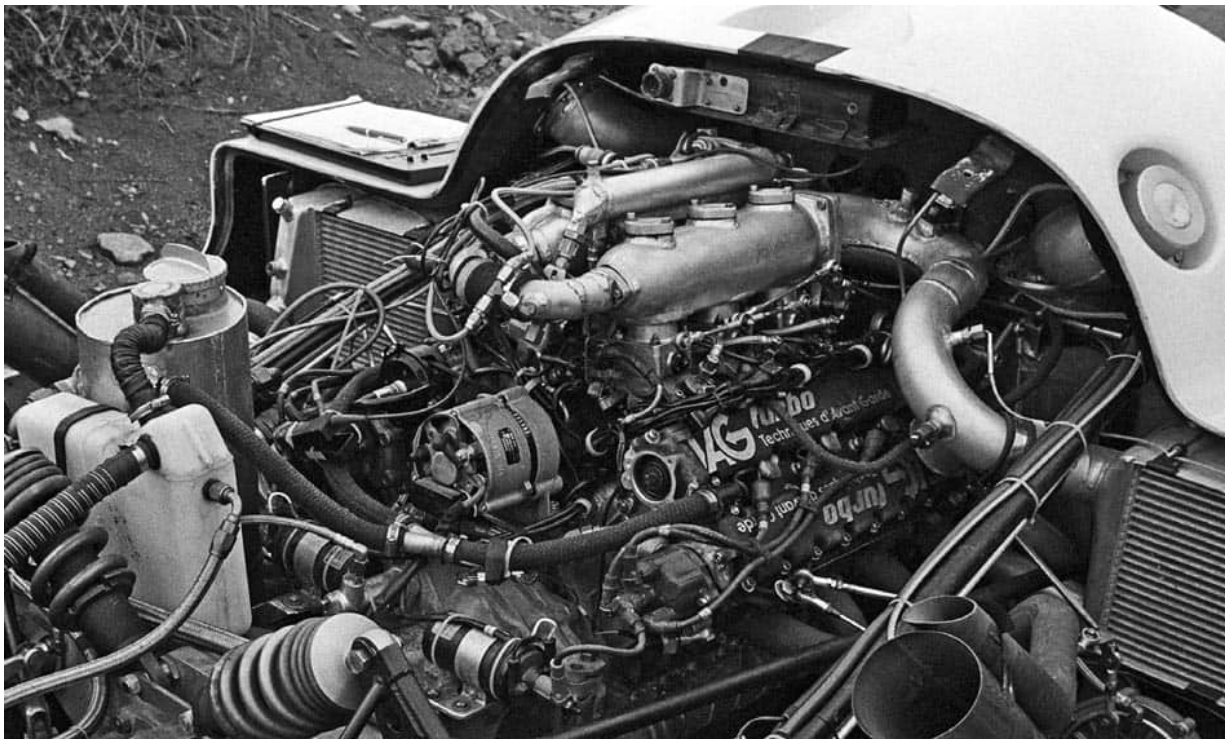


The TAG McLaren Porsche Formula 1 engine. (P)

Renault wanted to go into F1; it was trying turbocharging on its Sport Prototypes, and Bernard Dudot, who had first tried a British Holset turbocharger on an Alpine Renault rally car in the early years of the 1970s, was called upon to develop a 1500cc turbocharged engine. The gestation was painful, with many failures, but the Renault RS01 appeared on the grid at the British Grand Prix at Silverstone in 1977, powered by a 1500cc turbocharged engine. It was not an immediate success, but when it was running, to everyone's surprise it was blindingly fast. None of the other teams, though, took much notice for almost two years, as Renault worked on getting the engine as reliable as it was powerful. Then at Dijon, at the French Grand Prix on 1 July 1979, the turning point was reached. Jean-Pierre Jabouille took pole position and went on to win the race with the twin-turbocharged Renault RS10; not only that, but in 3rd was team-mate

René Arnoux. Only the Ferrari of Gilles Villeneuve spoilt a one-two. The turbo had arrived. Over the next few years the turbo engine became the engine to use, and an enormous chase for power had begun. (The full story of the first turbo F1 cars can be read in this author's book *Alpine & Renault – The Development of the Revolutionary Turbo F1 Cars*, published by Veloce.) Ferrari joined in; BMW, too. By 1981 the writing was on the wall for the normally-aspirated 3-litre engine.

At the then recently established McLaren International, supremo Ron Dennis took note. His technical director John Barnard had already said: "We are going to need a turbo engine if we want to be competitive in the future." They looked at the Renault V6 engine and rejected it; they looked at the in-line four of BMW and rejected that, too. The ever-astute Ron Dennis suggested they might look at Porsche – they had the technology and the technical expertise. Dennis asked Porsche, which already had a 1.4-litre turbo engine (it was the 935 'baby': see Chapter 4), if it could build an F1 engine. Cutting a long story short (the full story can be read in many eminent works, including Hans Mezger's own story), Porsche said yes, but who is paying? McLaren went to its long-time sponsor Marlboro, which was not able to oblige with the size of investment required. However, Saudi Arabian Mansour Ojjeh, whose family's company Techniques d'Avant Garde was already involved in F1 as a sponsor, became involved. A deal was struck: TAG would be the name on the engine. John Barnard and Ron Dennis would call the shots as McLaren became a customer of Porsche, which was asked to build an engine to specific exterior dimensions to suit the design of the next McLaren F1 car. The internal design of the engine would be done by aforementioned Porsche legend Hans Mezger. It would be designated the type TTE-P01 engine. The contract was signed between Ron Dennis of McLaren and Porsche's then chairman, Peter W Schutz, on 12 October 1981. Just over a year later, on 18 December 1982, the first running of the new engine took place in Porsche. The race to be on track had begun.



The TAG P01-V6 F1 engine installed in the 956-107 to be tested by Jürgen Barth in the spring of 1983. McLaren was not best pleased! (P)

Others were entering the game – Honda had an engine on test; BMW were aggressively chasing power, as were Renault. Hans Mezger told the author: “It was a big surprise when we heard that Honda were going to announce their new engine only two hours before we introduced ours, at the Geneva Motor Show in 1983, and an even bigger surprise to me was how close their design was to our engine.”

Porsche needed to test, but McLaren did not yet have a car ready, so Porsche found a 956 Sports Prototype that was lying idle: chassis 107. Jürgen Barth drove the car. He got out of it with a grin on his face and said: “It goes better than the Group C!” Ron Dennis was not smiling, however: their contract with Porsche stated that the engine should first run in a McLaren. It was part of the whole overall public relations concept, and the raison d’être of the McLaren, TAG and the view of the F1 world. A lot of discussions and healing of wounds took place, and a quick solution was found to install the engine in a ‘hack’

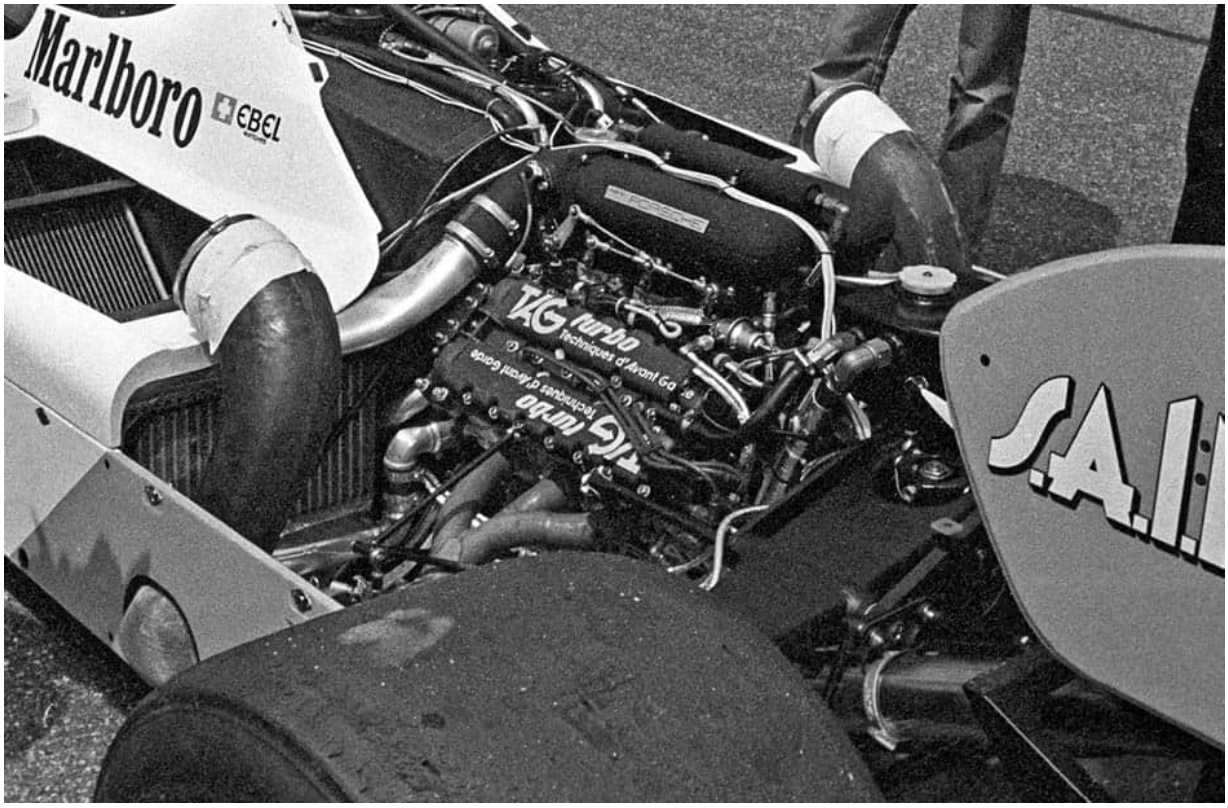
McLaren chassis while the MP4-1 was completed.

John Watson first drove the car at Weissach on 9 June, and Niki Lauda took his first drive on 6 July. The 956 was allowed to continue to be used for secret development work until the September of 1983. Lauda was formally to join McLaren in a comeback attempt at F1. (He had retired at the end of the 1979 season, having won two world championships with Ferrari.)

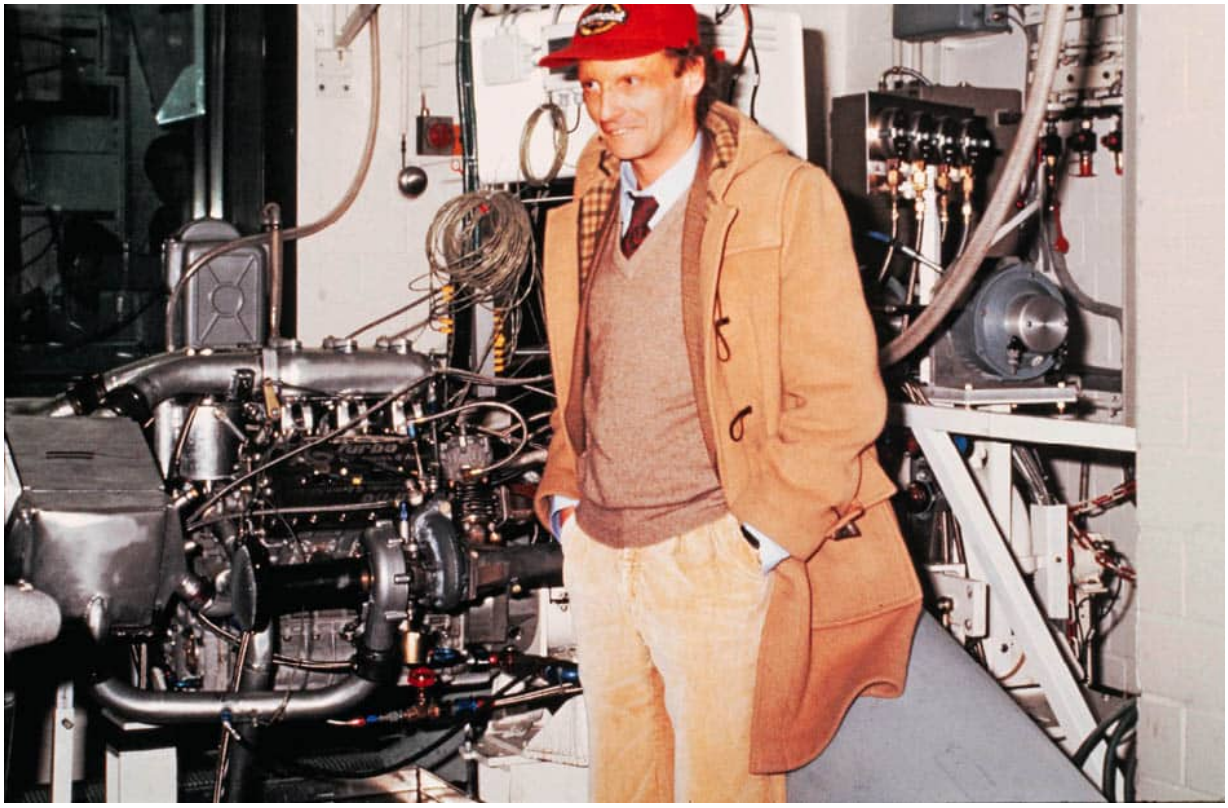
It would be late August, however, before the new car, a McLaren MP4/1E, debuted the new twin-turbocharged TAG engine at the Dutch Grand Prix at Zandvoort (28 August 1983) in the hands of Lauda. The car was fast, but brake failure lead to a dnf. Hans Mezger: “We had around 700bhp then, which was 200 more than the normally-aspirated Cosworth engine that, up to that time, had been used by most of the F1 teams in the championship, including McLaren. However, we had a lot of problems with the Bosch electronic fuel-injection system. At that stage we would have preferred a mechanical system, but they were set on the electronic one. We had a lot of discussions, and we had 5-bar pressure in the system, which was advanced thinking in the early 1980s.

“We had tested the car at Weissach with John Watson and Niki Lauda, and I remember with the McLaren originally being designed for the Cosworth, several immediate problems arose with installing the new TAG Porsche unit into the car, which then had no modification.” When the car first appeared on the track in anger, McLaren designer John Barnard was regularly designing bigger and bigger radiators as each race went by. In addition, with such a power leap, the drivers, then Niki Lauda and John Watson, were having to brake 150m earlier due to the brakes being undersize. This of course was a setback, because it took longer to get back up to speed, and so called for ingenious driving.

Preparations at Weissach for the first test, 9 June 1983. Jochen Mass, left, talks with John Watson. (P)



The TAG V6 Porsche engine is built, installed and ready to test; final adjustments are conducted. (P)



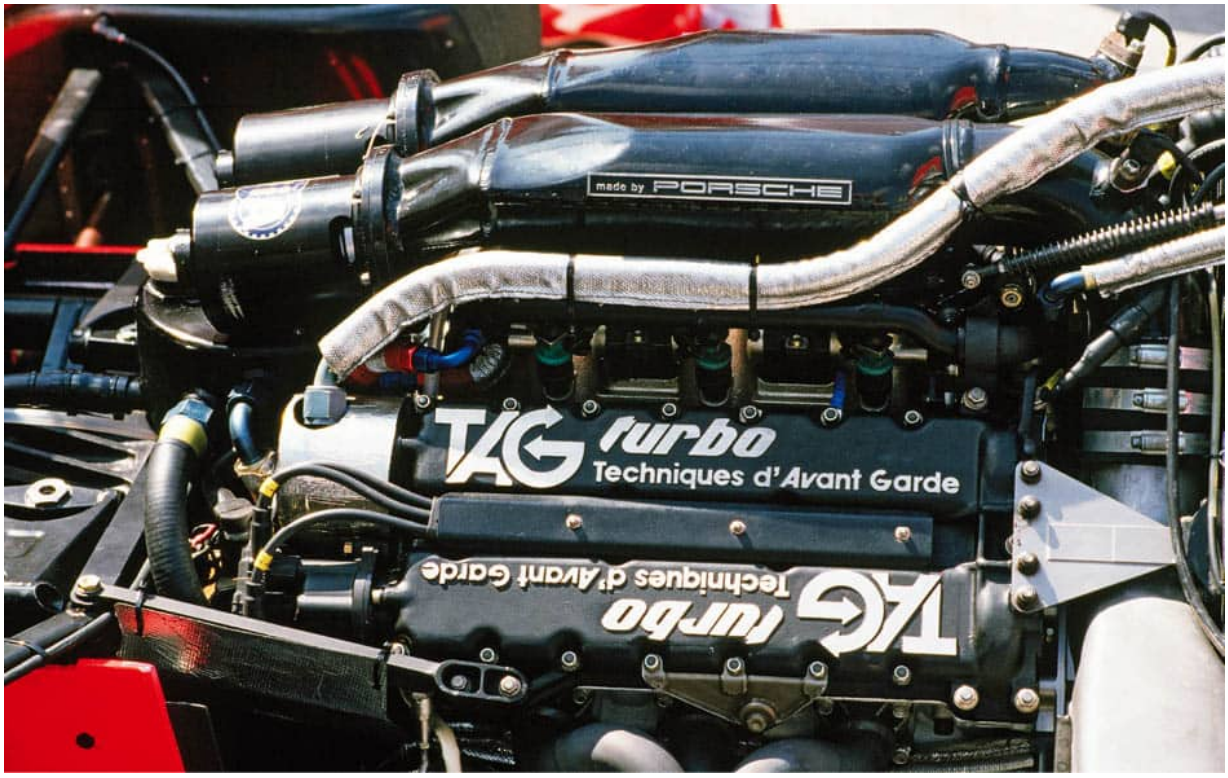
Niki Lauda visits the TAG Porsche engine testing bay in Weissach. (P)

McLaren had a possibility to win at the final race of the 1983 year at Kyalami, whilst the championship was, at that moment, heading in the direction of Renault or Brabham-BMW, both running turbo cars, as were Ferrari, Tolman and Lotus. This was a period of interesting fuels and they would play a part in the championship that year.

The late François Guiter of Elf, which was sponsoring and working closely with Renault, told the author in 2007: “At the South African Grand Prix, Kyalami, 15 October 1983, we were struggling for pace; somehow the Brabhams seemed to be faster than they had been before. We had to push things if Prost was to win the title, but it spelt doom: Prost failed to finish – we had turbo failure on lap 35. Patrese took the victory in the Brabham. Piquet, also in a Brabham, was 3rd and pipped Prost to the title by just two points. However, we were sure there was something not quite right with their car. Our engineer, Jean-Claude Fayard, told me he was sure that the fuel Brabham was

using was illegal. All we had to do was to put in a complaint and I asked Renault to do so, but they didn't want to; there was a bigger picture and the image of the Régie would be on show." So a furious Prost lost the championship by two points. He left Renault to join McLaren-TAG. François Guiter again: "Several months later, the boss of the Brabham stable at the time allowed himself the indulgence of admitting to me that their fuel was indeed 'suspect,' but he said that it didn't give them such a great advantage. Not very much – only 40bhp!"

This was a period, too, when F1 teams were regularly installing special engines in their car for qualifying, there being no penalty on the number of engines being used or the type, so long as they met the regulations. Things were getting out of hand power-wise, and for 1984 the authorities for F1 brought in a fuel-saving formula that set the amount of fuel allowed to be used to 220 litres (58.1 gallons) per race. The idea was that this would slow the turbo cars, thus allowing the normally-aspirated entrants to have a more level playing field. Porsche came up with a response that included a higher compression in the engine, and the fuel injected into each cylinder independently, instead of the fuel rail system previously employed. Even with the rail system, the engine was not very thirsty, but with the new timed and measured charge it became positively frugal. So much so, that at the first race of 1984 at Rio de Janeiro in Brazil, Alain Prost, newly signed from Renault, who would win the race, was found to have 20 litres of fuel still in the tank! McLaren-TAG were delighted. It was a sign of things to come, as the McLaren team would win race after race. Alain Prost won six more times, and Niki Lauda five times, with Lauda eventually taking the championship by just half a point ahead of Alain Prost.



The elegant final installation of the TAG turbo engine by Porsche, Kyalami 1983. (P)

The Tag-Porsche turbo engine took the McLaren cars to another world championship in 1985, this time with Alain Prost taking the honours.1985 was the year of cold fuelling: by cooling the fuel almost to freezing, it was found that because the particulates reduced in size a greater volume of fuel could be put into the tanks. For 1986 that was made illegal and the fuel tank size was also reduced. Porsche working with Shell (also Renault working with Elf) started to officially produce special fuels, which in the McLaren TAG-Porsche engine meant that the compression could be raised to 8:1, the previous increase being to 7.8:1. Turbo boost would be 3.4 bar, giving 850bhp, and, for qualifying, the boost could be put up to 4.2 bar. John Barnard, McLaren's designer, had the turbo installation moved to increase the ram effect, and by 1987 McLaren TAG had 900bhp available. Compression was now up to 8.7:1.

Telemetry started to appear, and, by the Mexican GP of 1987, car-to-pits data transmission had been made feasible. Over those few

years in the 1980s, development raced ahead at a phenomenal pace. 1987, though, would be the last season for the TAG-Porsche engine in the McLaren, the car that year designed by Neil Oatley and Tim Wright under Steve Nichols, an American designer who had taken over from John Barnard after he left to go to Ferrari. The engine had appeared in 68 races. 25 TAG engines by Porsche had been made since 1983. Three World Championship titles had gone to the McLaren TAG team, and Porsche's engine designer Hans Mezger, engine development engineer Valentin Shaeffer, and the TAG-Porsche engine team had seen their power units take 25 Grand Prix victories, seven pole positions, 44 podium places and 405.5 World Championship points. As someone might say, not bad for a sports car engine designer!

Why did the relationship stop? Porsche, as far as F1 was concerned, was a design bureau, and whilst the work with McLaren, led by the brilliance of Ron Dennis, had been a joint effort of cooperation, the work by Porsche was always invoiced to TAG. Porsche then, had been paid and did not want to finance its own F1 involvement. Honda, however, were prepared to invest themselves. There was only one decision in this situation that could be made, and Ron Dennis moved to continue McLaren's success with Honda. Hans Mezger and his team moved on to other projects, which would include a return to the Indianapolis 500.

Niki Lauda qualified 6th for the opening GP of 1984 in the TAG McLaren, but would go out on lap 38 with electrical problems. (P)

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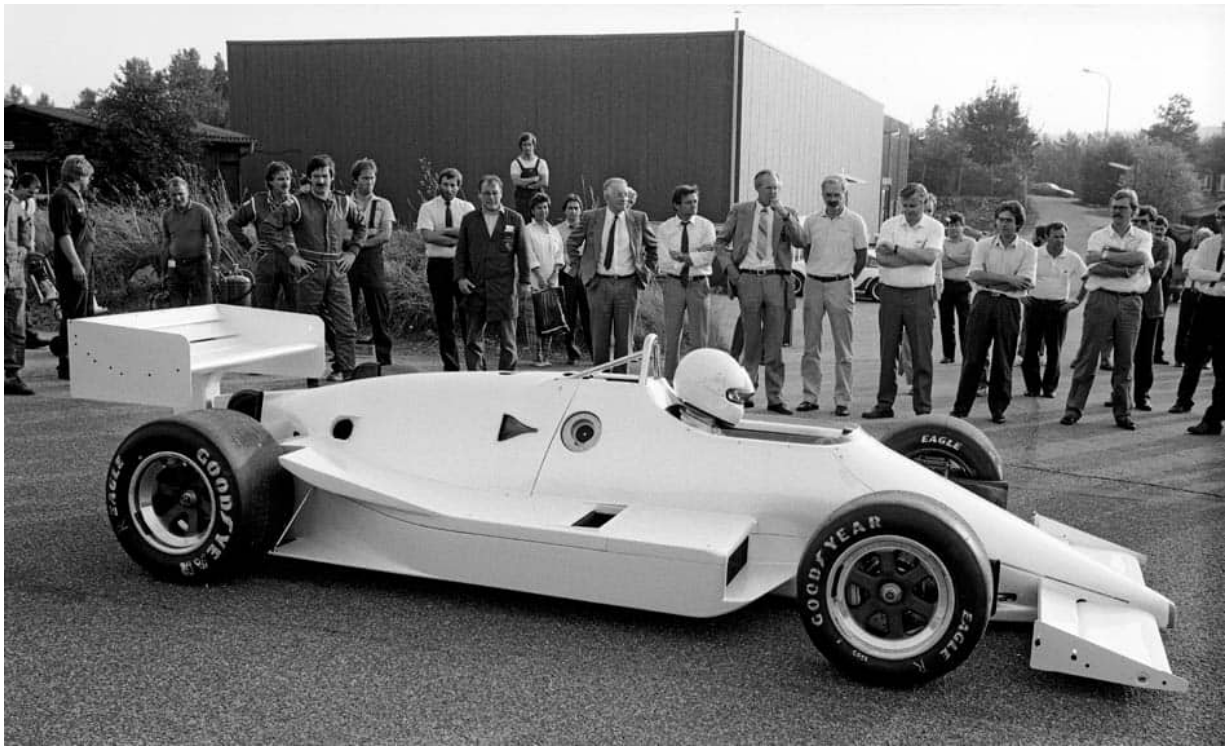
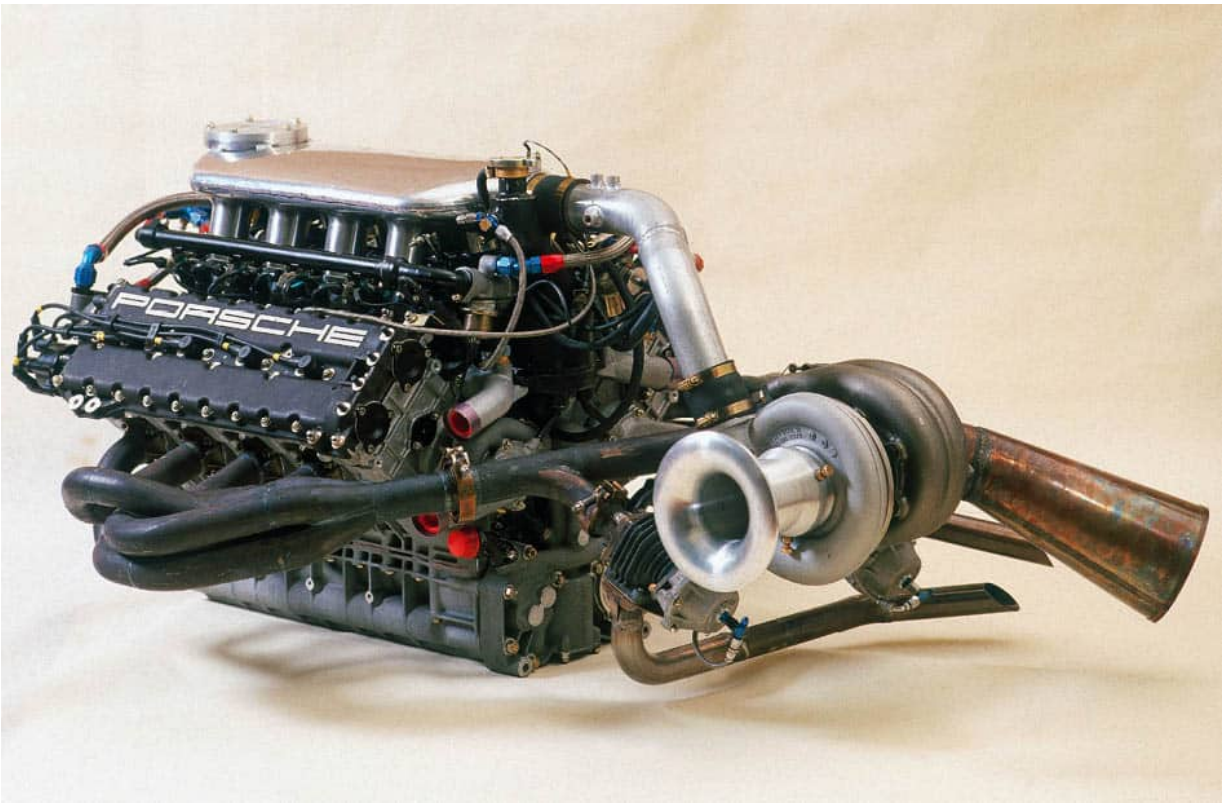
March-Porsche, the Indianapolis car '2'

Hans Mezger told the author: "Towards the end of 1985, we had already begun to think about a return to Indy, and this was helped by the enthusiasm of the Porsche America CEO Peter Schutz. I had some help with thinking about this, because the production engine team had recently completed the design of a four-cam V8. We were still working with McLaren and I had done some sketches for a V12, but they didn't come to anything. Up to 1988, all the engines we did had started life as normally-aspirated ones, and we added turbos. By 1988 and into 1989, the idea of a V12 was still there; also we had just got the new PDK twin-clutch gearbox. We engineers were at that time still thinking F1, and I was not involved with the development of that transmission. We were soon deep into the CART engine programme."

Already, as we can see, consideration was being given to go back to the USA with a car to compete in the CART (Championship Auto Racing Teams) Championship, which had over the years, since Porsche's last abortive attempt, developed into the number one single-seater series in the USA, Porsche's biggest market. A programme to develop an engine had already begun by the time Porsche ceased works involvement with the World Championship Sports Prototypes, after Le Mans in 1987. They would continue to service and supply components, but repairs and new chassis – monocoques – would fall to the lot of outside chassis manufacturers like John Thompson in the UK, Fabcar, Jim Chapman Developments in the USA, and Stickel in Germany.



The prototype 2708 Porsche Indy car chassis ready for a first run on 16 September 1987. Roland Kussmaul at the wheel. (P)



The first Porsche Indy engine of the new era: 11 December 1986. 2.6-litre, said to have 700bhp. (P)

The Porsche racing department's mindset was changing, to look across the Atlantic again. The Indy 500 was unfinished business. The project manager would be – guess who? – Norbert Singer. On his appointment he got his design team together, and on 1 July 1985 the designers started to study a design of a car for CART Indy car racing. *Porsche Panorama* magazine broke the news soon after the 1985 Frankfurt Motor Show. Of course, it was still early days. Engine-wise, there was plenty of confidence, and the McLaren-TAG story was going well, with successive championship victories. The 3-litre version of the 962 engine was still going strong. So why not a V8 engine for CART and that elusive Indy 500 race?

Al Holbert got involved: he was by then head of Porsche America Motorsports, having taken over following the retirement of Jo Hoppen. He sent Cosworth engines to Porsche for evaluation; Valentin Schaeffer started to investigate the turbo options, whilst

Hans Mezger's team got stuck into the complex CART engine rules, remembering the debacle from the earlier attempt with Interscope. One of the features of CART now was a rule that said no oil could be added during a race. The same car/engine combination had to be able to race on road circuits and ovals. Fuel, of course, was almost a rule book on its own. Engine-wise, Mezger's team would come up with a 32-valve V8, leaning on the format that was close to an existing successful Indy engine. For the car, Porsche initially designed and created a new chassis under the project management of Norbert Singer – a works car.

The Porsche-engined Porsche-designed car testing at Weissach in 1987. This car would go to the US directly afterwards for race exposure. (P)

Hopes were high, but the team on the ground had a number of issues they wanted to sort out before the car took to the track. However, the plan to do more secret development work before public exposure was overruled, and the car was shipped off to the USA a couple of weeks later for Al Unser to test at Portland, then with the plan to go on to Laguna Seca for a debut race. Unser and the team found it was 6sec off the pace! Norbert Singer was furious: he always tested, and secretly, before exposing a car; on this occasion he had little time, and the pressure from the USA led to near public humiliation for the great name of Porsche. One German magazine

called the test a “debacle; that Porsche should experience such a collapse on their American debut was not typical – unprofessional and unexpected.” Norbert Singer says: “In fact it turned out to be just another test, but in public. If they (the management) had listened to me, we would not have raced that year, only tested.”

A second car was built and sent to Holbert Racing, where it was prepared for testing at Sebring. The 01 had been back to Weissach for updating and improving, ready for a race they planned to do in 1987 at Miami. However, at the Miami race, with Al Holbert on board, he could not qualify the car into the race, so it was listed as a dns (did not start) for the reason that it was too slow!

Both cars were tested at Sebring by Unser and Holbert. Singer was frustrated. They went to do more testing at Roger Penske’s newly acquired Nazareth circuit, where a local resident was the great Mario Andretti. Al Holbert had got hold of an Indy Lola Cosworth from the Raynor team, to do a back-to-back test. Andretti told Singer: “The car’s too high off the ground!” Things didn’t go well. At Pocono, Holbert ran a lap at 197mph; Andretti was said to reach 210 there! Holbert spoke with Singer: “We should get a March,” he said. Norbert Singer and Porsche were in shock. But that’s what happened, and as our study is about the alternative race cars, we will leave this brief look at the works-designed and -built car, and turn to the chosen alternative. The Porsche power would go into a March.

Al Unser testing at Portland. The car would go to Laguna Seca, where it was qualified 21 (out of 24) on 11 October 1987, but water pump failure on lap 6 put paid to any hopes of a finish. (P)

March cars had taken the first five places at the 1987 Indianapolis 500. In December 1987, at a cool Paul Ricard circuit in France, a Porsche engine was fitted in a March 87C, and one of the 1987 Porsche CART cars, along with a Lola Cosworth, for secret tests. Jochen Mass and Teo Fabi (brought in by Al Holbert) did the testing. The tests were inconclusive. Singer took the cars to the wind tunnel that Sauber had used for testing in Switzerland. Al Holbert acquired two March chassis, and testing started in the spring of 1988. Among the tests was a three-day affair at the Firebird Raceway; there the Porsche car and the March were to go back to back. The decision was that the faster should go to Phoenix for the season opener. The March was faster: Fabi qualified the car 9th and finished 7th.

At last – a race completed and in the top 10! However, as Al Holbert pointed out, the competition had moved on; the Porsche power on this occasion was insufficient – it was still too slow. The engine would fail at Long Beach the week after Phoenix. Then there

was a disaster at the Indy 500 when the car lost a wheel in the pits! The team pressed on and Fabi redeemed the situation with another 7th place finish at Portland on 19 June. Then they had gearbox failure at the Budweiser Cleveland Grand Prix on 3 July. But Fabi gained 3 points at the Molson Indy race in Toronto on 17 July for coming home 10th. Fabi put the March-Porsche 3rd on the grid at the Meadowlands Marlboro Grand Prix, but suffered a water leak and slipped to 18th. 7 August was the day of the Marlboro 500 at the Michigan Speedway; Fabi qualified 12th, but mechanical failure on lap 56 put paid to his race. In the Quaker State 500, in front of the sponsors, the March 88C suffered suspension failure on lap 35 of the 200. At the Mid-Ohio Escort 200, though, it was pay-day again as Fabi qualified 11th and finished in 8th. Another 8th place came at Road America in the Briggs and Stratton 200 on 11 September. Even better was to follow at Nazareth on 25 September with a 4th-place finish for the March 88C Porsche from P12 on the grid. Another 10th place came at Laguna Seca on 16 October from 8th on the grid.

But the year ended on 6 November with a serious crash at Miami totalling the car. Teo Fabi finished the 1988 PPG Indy Car World Series in 10th place in the Championship of the 48 that had started. (These records are from the PPG Indy Car World Series archives.)

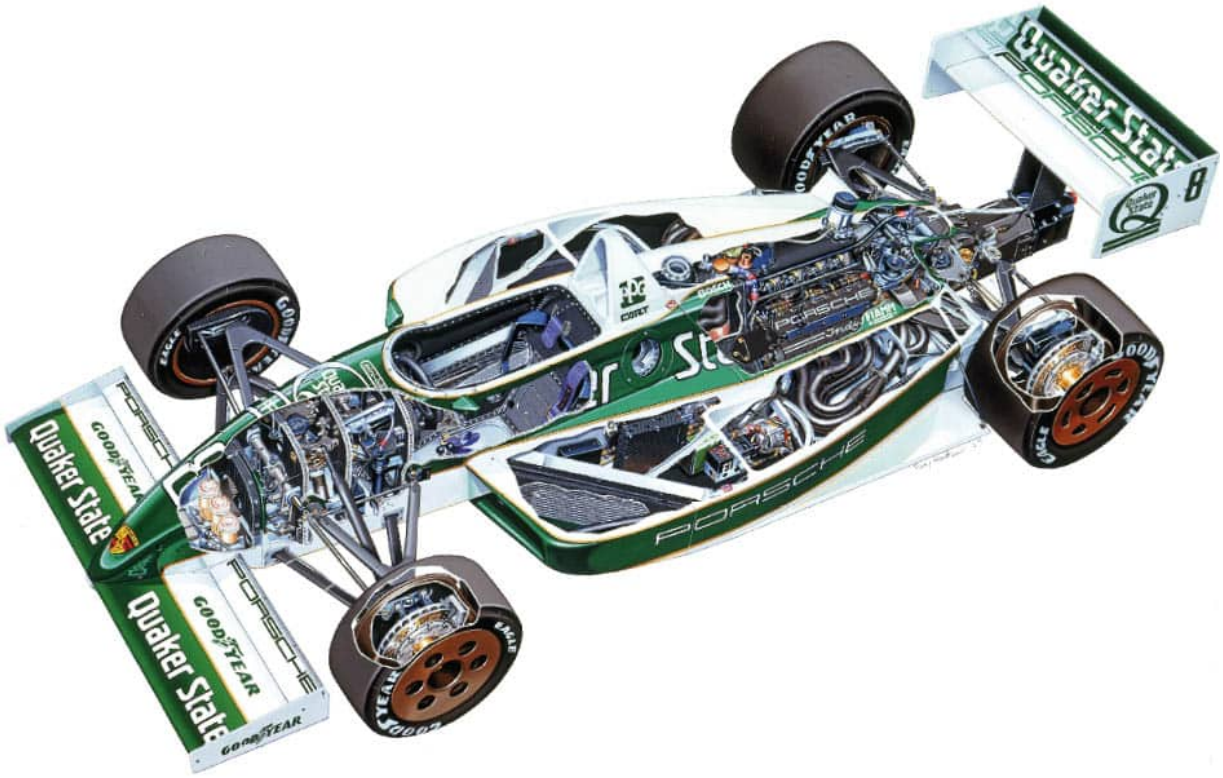
1988: the March-Porsche 88C, with Teo Fabi aboard, in the Checker 200 at Phoenix, on 10 April. 7th overall. (P)

10th place at Laguna Seca for Teo Fabi (8), just ahead of Jeff Wood's 23 Lola on 16 October 1988. Fabi started from 8th on the grid. (P)

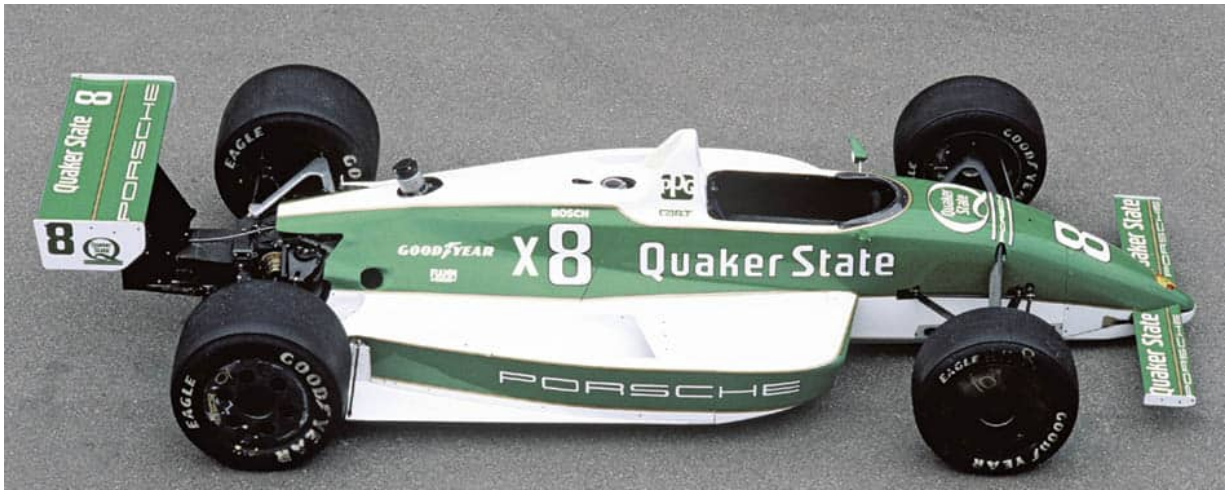
The idea initially at Weissach for 1989 was to continue to work with the development of the Porsche car. The other way of thinking was the Holbert route – a new March chassis. Then sadly, as recorded earlier, Al Holbert died in a plane crash on 30 September 1988. The fear was that the project was over – they had lost the key man in the link with March.

However, the initiative between Al Holbert, earlier in the year, and Helmut Flegl, had agreed that March would design a new car, the March 89P, for the 1989 season. March Engineering, frequently on the brink of financial difficulties, had acquired a separate facility to design and build customer Indy cars, of which there were many.

Early work in Weissach with a March chassis. (P)



The 1989 March-Porsche CART Indy car. (P)

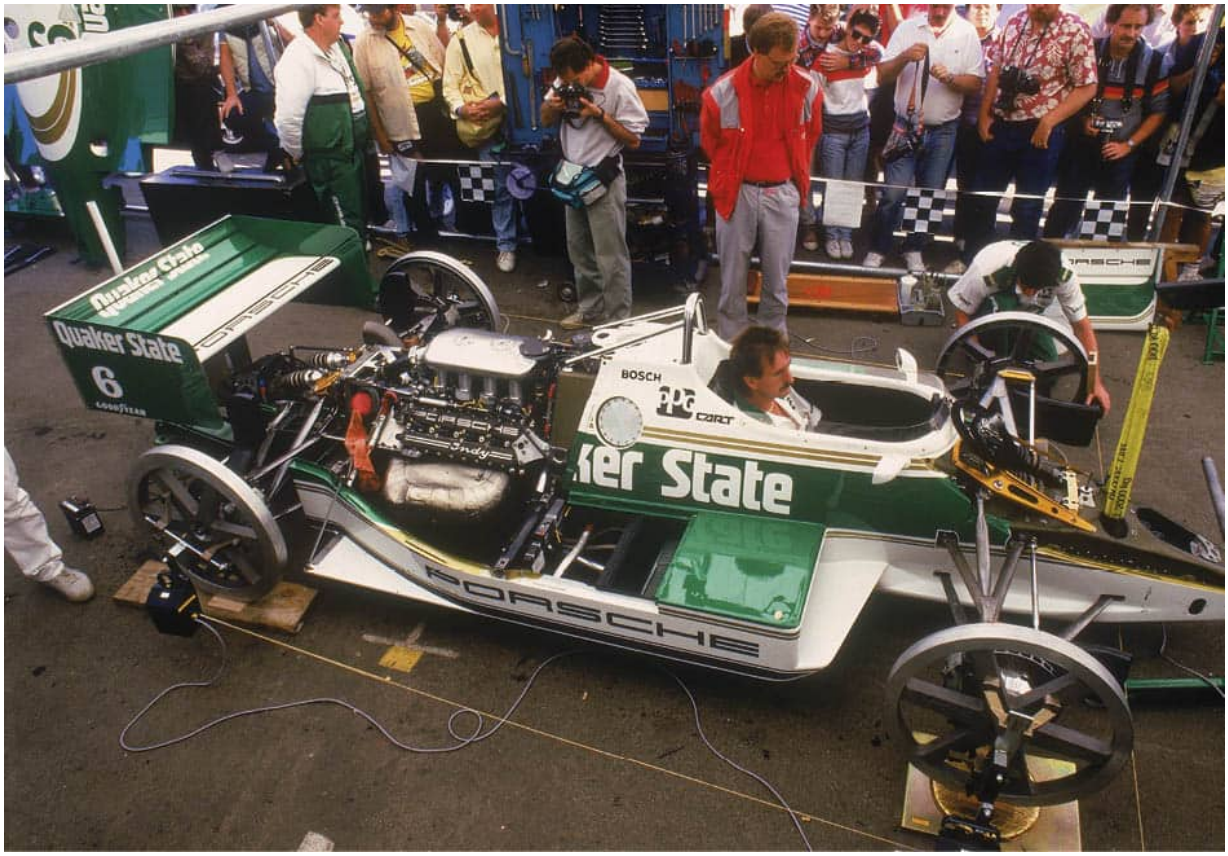


1989 would be a successful year for the March-Porsche. (P)

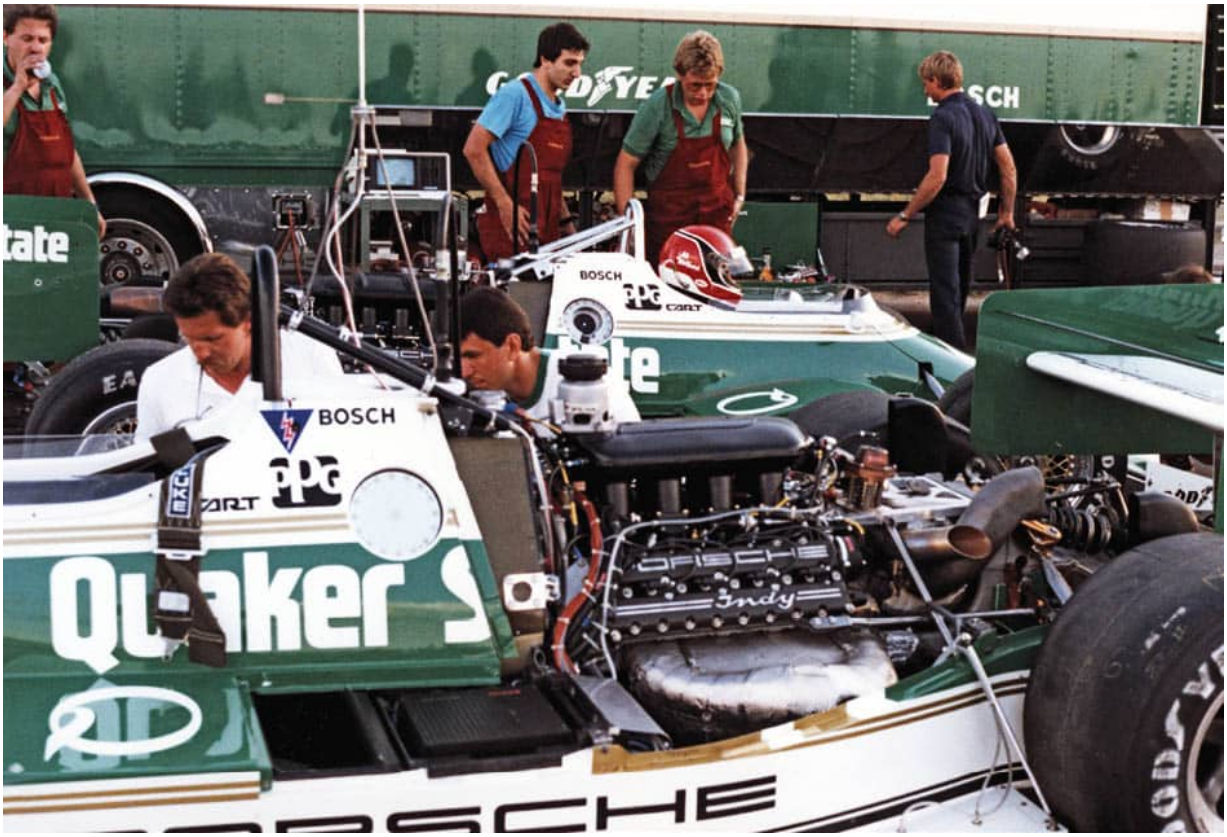
The Indianapolis 500 (Hans Mezger right behind car): Teo Fabi hoped for a good result, but it wasn't to be. (P)

The 89P March proved to be the best handling in the series of cars, at an early test at the Firebird Raceway ahead of the first race of 1989 at Phoenix. The CART Racing Indy car season would kick off at Phoenix on 9 April; Fabi reported that the car felt good. He qualified 8th and finished 6th. At Long Beach on 16 April he qualified 3rd fastest, but electrical failure (say some records – official race records say radiator) in the race led to the car's demise. At the Indianapolis 500 on 28 May, the March-Porsche qualified in 13th

place on the grid with Fabi at the wheel. In the race, however, despite running faster than in qualifying, it was not to finish: ignition failure is recorded as being the reason it went out on lap 23. Undaunted, Fabi turned it all round at Milwaukee on 4 June, where he got on the podium in 3rd, having qualified 9th. On 18 June at Detroit, Fabi was 4th from a start position of 8th. Two more successive 4th places at Portland (25 June) and Cleveland (2 July) were followed by a 9th at Meadowlands (16 July) and a 4th at Toronto (23 July). Then came a 2nd place from 3rd on the grid at the Michigan International Speedway in the Marlboro 500 on 6 August. No one was joking now: the Porsche engine was delivering in spades. Fabi followed Michigan with another 4th place finish at Pocono (20 August). It came together at the Red Roof Inns 200 on the Mid-Ohio Sports Car Course, a 2.4-mile paved oval, 84 laps/200.5 miles, on 3 September 1989, when the No 8 Quaker State March-Porsche 89P was on pole and went on to win the race outright. But Fabi got pipped into 2nd at the next race: Road America on 10 September. Something strange happened at the Nazareth Speedway on 24 September: having qualified 3rd, poor handling let the car down, and it finished down the field in 16th, with only 108 of the 200 laps covered. 15 October was to be a bad day at the office again at Laguna Seca: having qualified 3rd, a big accident on lap 48 put paid to any last race success. Teo Fabi and the March-Porsche finished 4th in the 1989 PPG Indy Car World Series Championship. The Porsche management was reasonably happy, and the contract with March was extended to the end of 1991.



Hard work brought results in 1989.



Now for 1990, and two cars. (P)

Interestingly, by the end of 1989 the design team at Porsche had started to design a new engine for the Arrows Formula 1 team, so whilst one cannot say it had taken its eye off the ball for CART, Hans Mezger was already looking at that new project, of which we will learn more in a moment. Mezger was to oversee the work on the ongoing development of the 90˚ V8 CART engine, which for 1990 would have 750bhp at 12,000rpm with peak torque coming at 10,000rpm.

The new March 90P would be lighter than the previous model and all carbon fibre in construction. CART had given the okay, but then changed its mind to revert to the 1989 regulations calling for an aluminium floor for 1990.

The Porsche-run Helmut Flegl/Derrick Walker (an Indy legend) team would run two cars in 1990. However, a sponsorship deal with an ‘industrialist’ from Belgium fell through, and Porsche was lucky when after much effort it secured Fosters Beer support from

Australia.

The start of the 1990 season was on 8 April, and, in the first race at Phoenix, John Andretti drove the 89 car No 41, qualifying 16th on the grid; all was going well until lap 139, when a halfshaft broke. Teo Fabi, in the second March 89P No 4, fared even worse: after qualifying 13th he suffered engine failure at the start, and that was it – zero laps.

John Andretti in the 89 car No 41 at Phoenix, qualifying 16th on the grid; all was going well until lap 139 when a halfshaft broke. (P)

Teo Fabi in the second March 89P No 4, after qualifying 13th, his race turned to disaster when he suffered engine failure at the start and that was it: zero laps. (P)

The 1990 Porsche engine installed in the March 90P. (P)

Teo Fabi's Fosters car No 4 made it to only 23rd on the grid, and in the race lasted only to lap 162, when its transmission (clutch) failed. (P)

At the Toyota Grand Prix of Long Beach on the Long Beach Street Circuit on 22 April, Fabi would qualify 7th and finish 10th overall, while John Andretti went out on lap 63 with radiator problems. Next up came the Indy 500, and the delayed appearance of the new 1990 March was over, as a sponsor had been found in the shape of Foster's Beer. Teo Fabi in the Foster's car No 4 only made it to 23rd on the grid, and in the race lasted only to lap 162, when his transmission (clutch) failed. John Andretti qualified better in the 41 car in 10th, but was to spin out in an accident on lap 136.

The remainder of 1990 looked like this:

Date	Place	Driver		Race result
3 June	Milwaukee	John Andretti	11th	7th
		Teo Fabi	8th	12th
17 June	Detroit	John Andretti	13th	dnf, gearbox
		Teo Fabi	9th	dnf, electrical
24 June	Portland	John Andretti	15th	dnf, clutch
		Teo Fabi	9th	7th
8 July	Cleveland	John Andretti	12th	5th
		Teo Fabi	9th	dnf, electrical
15 July	Meadowlands	John Andretti	12th	dnf, crashed
		Teo Fabi	6th	3rd
22 July	Toronto	John Andretti	10th	13th
		Teo Fabi	5th	15th
5 August	Michigan	John Andretti	8th	7th
		Teo Fabi	7th	dnf, poor handling
27 August	Denver	John Andretti	8th	6th
		Teo Fabi	Pole	dnf, crash lap 7
2 September	Vancouver	John Andretti	13th	5th
		Teo Fabi	11th	16th

16 September	Mid-Ohio	John Andretti	10th	13th
		Teo Fabi	7th	19th
29 September	Road America	John Andretti	10th	dnf
		Teo Fabi	8th	dnf
7 October	Nazareth	John Andretti	10th	dnf
		Teo Fabi	22nd	11th
21 October	Laguna Seca	John Andretti	9th	8th
		Teo Fabi	8th	7th

1990 was a tough time, and the car was running heavier than hoped, due to the modifications March had to make to get the all-carbon car to comply with CART requirements. The car was found to be too pitch-sensitive on the ovals. Derrick Walker was, though, high in his praise for the Porsche engine of 1989 and 1990, but he felt the chassis was not quite right. The results in 1990 speak for themselves, and Porsche management was not used to, or happy with, the expenditure or the results. Formula 1 seemed to offer a better option. Management stopped the CART series racing. It was another chapter closed. Before we leave March-Porsche, there is a one-off single-seater that ran in Japan – in the Grand Champion series, carrying race number 17 in 1978. The car, a March 74S, was fitted with various engines, one of which was a 3-litre single overhead cam RSR engine, and was driven by one Hisayoshi Mitsuhashi. It was not a successful exercise but nevertheless worthy of a mention.

John Andretti in the No 41 car: 10th place qualifier at the Indy 500, but was to spin out in an accident on lap 136. (P)

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Footwork-Arrows-Porsche

During the years working with McLaren, producing the TAG Formula 1 engine, Hans Mezger and his team had gained enormous knowledge, and the success of the McLaren/TAG-funded project had allowed massive development. Of course, those engines were turbos. In 1989 the turbo engine had run its course, and the FIA were bringing in a new Formula for the Grand Prix Formula 1 car engines. It would be a rule specifying the capacity of 3.5-litre – normally-aspirated, no turbos.

Of course, Hans Mezger and his team, and Porsche management, kept their ears to the ground, and following the agreement to end the association with McLaren, Hans Mezger was called in to discuss the situation. Mezger told the author: “We were told to go ahead with thinking about a V12 for F1, which had already been on our minds, but I felt it would be very expensive. Management were still considering this route, with another partner maybe. Then suddenly,

soon after Ulrich Bez had come in as head of research and development following Mr Bott's retirement, I was asked to go ahead and do it: create a V12 engine." Although by 1988 McLaren was tied in to Honda, talks had taken place with McLaren in 1986, at a meeting in Weissach on 7 November. From the records, we see that a V12 was more than just a figment of imagination. Renault and Honda had arrived in 1989 ready with V10 engines. Porsche was thinking V12, but Hans Mezger was concerned about vibration, something that had been a problem on the flat-12 917 engines many years before. He looked carefully at the V6 design of the TAG engine: here lay his answer, and the team set about designing an engine that was basically two V6s. The designation of the new engine would be Type 3512. The injection system and ignition would be Bosch Motronic. Hans Mezger says: "We didn't have a customer specifically at that time, but Ulrich Bez was determined Porsche should be in F1."

Through 1989, with races already running to the new rules, Bez went looking. Going to all the F1 races, he made his point to various teams that Porsche was interested in supplying an engine to an F1 team. At the same time, Arrows F1, who had been around since November 1977, being formed by a breakaway group of personnel from Don Nichols's Shadow team, had in recent years received several approaches to buy the team, but founder Jackie Oliver was not moved. However, come the end of 1989, Oliver found himself needing to look for a new engine, hopefully backed by a factory engine supplier. Funds were as tight as they had ever been, a situation the team was familiar with. Even so, Ross Brawn had created the new Arrows A11 for 1989, and the team used Cosworth V8 engines for the new normally-aspirated formula. Drivers Derek Warwick and Eddie Cheever stayed with the team, as did their sponsor, insurance giant USF&G. The team would finish 7th in the Constructors' Championship. However, the team had invested in a new multi-million-pound technical centre. There was no more money! Ross Brawn and drivers Cheever and Warwick left the team at the end of the season. Team principal Jackie Oliver had a problem, and he was having no luck finding a budget. However, watching the scene

intently was one Wataru Ohashi, head of a billion-dollar company that employed over 11,000 people, and one of Japan's top entrepreneurs. Amongst his portfolio was a core of transport businesses that he had arranged under the Footwork banner. Ohashi had already been involved in F1, and he approached Oliver with a view to buying Arrows. Ohashi also wanted Porsche. The Arrows team was subsequently sold to Ohashi's Footwork corporation, and soon to be announced would be a new deal to run Porsche V12 engines in 1991. Through 1990, the Arrows team continued to use the Ford Cosworth DFR V8. Bez at Porsche was already in discussions with a lower-rated team, his idea being to start with a small team and then move up, and indeed the Footwork offer had come along during discussions with the Onyx F1 team (they ran in 1989 and 1990). As we have seen, Ohashi knew about the Porsche plans, and wanted the Porsche engine. A deal was finalised, and the work on the new V12 started to be geared towards the Footwork-Arrows team. Footwork-Arrows, too, set about designing a new Formula 1 car to take the new Porsche V12.

Porsche Type 3512 F1 V12 from 1991. (P)

The engine was delayed: it had been designed from scratch, and like good food it takes time to prepare. Unfortunately, the F1 business was one that did not appreciate time. A firm, some say stern, letter from Jackie Oliver and chassis designer Alan Jenkins had done nothing to help the cooperation. It was July 1990 before a ‘starter’ engine was inserted into an A11C for a first test fit. On 6 September 1990, the new V12 fired up for the first time on the dyno. By October it was in a test chassis, an Arrows A11C, at Silverstone with Michele Alboreto at the wheel. Hans Mezger reported, “We are satisfied.”

Porsche foresaw that the 1991 season would be a test year, whilst 1992 would be the year to go for honours. That was not what Footwork had in mind. But Porsche was under pressure, in the same way as it had been with the Indy car engines: it had succumbed to the pressure from the customer to get on the track before the engine was truly ready.

Michele Alboreto in the A11C Footwork-Arrows ventures out on track at Silverstone, October 1990. (P)

Silverstone, October 1990: hopes were high at this stage, and the engine team was initially happy. (P)

The FA12 that was intended to start the season had to be modified when the car designers found that the Porsche engine was dimensionally too big – the chassis had to be redesigned to install it properly. Then the first FA12 was destroyed in a testing accident, with Michele Alboreto on board, who was then substituted by Alex Caffi at the San Marino Grand Prix, which was to have been the debut of the new FA12 and the Porsche engine. Caffi failed to qualify the car. Alboreto had to use an old A11C; he failed to qualify, too. For the next race, the Monaco Grand Prix, both drivers had FA12s – Caffi once again failed to qualify, but with good reason: he had a huge accident at the Swimming Pool complex during the Saturday qualifying, and the car was too damaged to continue. Alboreto qualified second last, and in the race lasted only 39 laps before his engine failed.

The next race in Canada saw Stefan Johansson replace Caffi, who had been injured in a road accident. Alboreto qualified 21st, Johansson 25th. At the start Alboreto moved up to 15th, but on lap 3 suffered a sticking throttle: his race was over. Johansson had the same problem and went out on lap 48.

At the Mexico Grand Prix, race 6 of the 1991 season, Johansson did not qualify. Alboreto ran at the back of the race before retiring on the 26th lap. For the French Grand Prix, Footwork-Arrows replaced the Porsche engine with a Brian Hart DFR engine.

Overweight, underpowered and underdeveloped, the project had been a disaster. One cannot blame the engineers: their work, always exemplary, was completed under duress and pressure to deliver fast. The engineering team was working flat out, but also with the pressure of other projects. Max Welti, Porsche's F1 project manager requested a dedicated F1 department, but it didn't happen. Jackie Oliver's Footwork lawyers were looming; things were looking bad and it was in the public view. Heated discussions were regularly taking place and the arguments that followed were legion. Our purpose here is to feature the alternative race cars to Porsche's own chassis. The Footwork-Arrows was one of those cars. Although an unhappy episode, it was a car powered by a Porsche engine. Porsche had had enough: Formula 1 was a bridge too far; it was damaging their

reputation. It was announced on 17 October, just prior to the 1991 Japanese Grand Prix, that they would not be continuing with any more engines for Formula 1. The engineering team was broken up, and Porsche got on with their core business of making great sports cars and great sports car engines.

The FA12 Footwork-Arrows undergoes technical checks at Silverstone, 1991. (P)

1991 US Grand Prix, Race 1 of the Grand Prix season in Phoenix, Arizona: Michele Alboreto qualified 25th but retired on lap 41. (P)

Chapter 9

Extra ‘Porscheons’ – land, sea, and air

This chapter is an extra portion of Porsche power – not specifically racing cars, though there are some. This final section of our story is a dedication to the other areas where Porsche power had a place. One item is omitted though: military equipment, an area in which Ferdinand Porsche excelled, both in the First and Second World Wars. The story of the military items is extensively covered elsewhere by others, and so we invite the reader interested in those items to look in that direction. Here we will continue with Porsche-powered manifestations in the civilian world. We begin by continuing the competition theme.

Nomad-Porsche – a Thundersports racing adventure

We include this car in this section of extra ‘Porscheons,’ because although the chassis goes back to the late 1960s and into the 1970s, it did not use a Porsche engine then, but after many years in storage, come the 1990s, for racing in Historics and the British Thundersports series, the car’s new owner fitted the Nomad with a Porsche engine. A traditional and pretty car, it could not be left out. Among the many players in the game by the 1990s, this car is an interesting throw-back to the 1970s. It re-appeared as a championship winner in 1998. The Nomad was a creation of former Lotus mechanic Bob Curl and Mark Konig. At the time, Curl was looking after the cars of Mark Konig. They were lamenting the fact that all the great small-engine long-distance sports cars that were winning everything in the period were from Italy, France or Germany. This was in the mid 1960s, of course. Curl decided to present to Konig an idea for a sleek new design; Konig was taken by it and decided to go into partnership with Curl, in fact financing the whole project. And what a project it turned out to be! Three Nomads were built to contest International Sports Car races in 1967. Starting with the Mark 1, which was fitted with a

1558cc Lotus Ford twin-cam. The car raced successfully, taking in 15 races in 1967/8, including a finish (32nd overall) on the Targa Florio, the Trophy d'Auvergne (7th), Daytona 24 Hours (24th). In the Brands Hatch 1000km, it was at one stage ahead of the factory Alfa 33s before crankshaft failure.

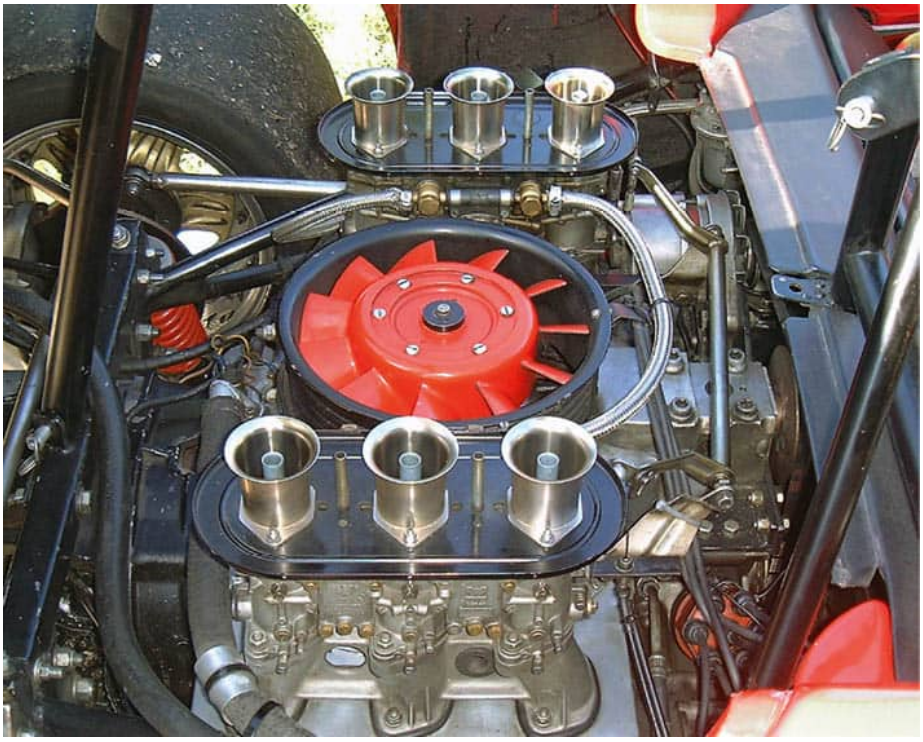
The Mk1 Nomad Lotus twin-cam in the paddock at the 1968 Brands Hatch 6 Hours. (PA)

Le Mans 1969: the preparations begin. On 15 June 1969, in the race, Mark Konig/Tony Lanfranchi were 33rd in the line-up; unfortunately, 38 laps in, the gearbox started leaking oil onto the clutch and that was that – dnf. (AJFR)

The Mark 2 would have BRM parts installed, following the purchase of an old F1 BRM utilising a 2-litre BRM engine. Mark Konig and Tony Lanfranchi were joined by other drivers on occasions, to race at Le Mans in 1969, the Targa Florio, BOAC 500, Spa 6 Hours and the Springbok Championship in South Africa, amongst many other races, collecting several podium positions along the way to the end of 1970. In 1983 Terry Davison, a confirmed Nomad enthusiast, acquired two Nomad cars, one of which was the Mk 3 version. As a Porsche enthusiast, Davison was Chairman of the Porsche Club Great Britain from 1992 to 1995, and he decided to install a Porsche unit. A 3.2 911 engine was acquired, fitted and tuned with a set of 46 IDA Webers and fitted it with the overhead fan system.

The rest of the engine remained pretty much as standard for reliability, and in the lightweight 720kg chassis could deliver great performance from its 260bhp Porsche unit. Davison had set about a three-year restoration in 1995, and returned the Nomad to racing in the burgeoning Historic championships in 1998, winning the Class E HSCC Thundersports Championship.

Brands Hatch in recent times: the Porsche-powered Mk 3 Nomad. (JS)



Terry Davison decided to install a Porsche 3.2 911 engine; it remained pretty much as standard for reliability, and in the lightweight 720kg chassis could deliver great performance from the 260bhp Porsche unit. (TD)

The Mk 3 Nomad's chassis weighed in at 720kg; the 3.2-litre Porsche engine developed 260 reliable bhp. It proved to be a formidable combination, and could deliver great performance from its 260bhp Porsche unit. (TD)

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Ford Sierra-Porsche – a Thundersaloon adventure

During the 1980s, a type of racing called Thundersaloons, like the Thundersports, had became very popular in the UK. The principle was that you took a regular-looking road car, and fitted an engine that was somewhat more powerful than the standard version. But not only that: the bodywork could be modified, which led to some wild creations. The Ford Sierra Cosworth, then the RS 500, were cars that were already set up for racing and rallying, and would become desirable. Some owners, though, went further. Rod Birley had been racing in many forms of the sport since 1973. Come the 1980s, with a strong reputation, Birley was already known to be a competitive racer, and came up with an idea to install a Porsche engine into the front of a Ford Sierra. The car appeared in 1989, and it is said was capable of 180mph down the straight at Zandvoort. This was no ordinary flat-six from the then-current 911.

Birley and his project partner Terry Nicholls had acquired a 962 3.2-litre air-cooled engine to install in the Sierra, in place of its Ford unit. To say it would be a technical challenge would prove to be an understatement. A special bodyshell was created to accommodate the engine with its overhead cooling fan in its original (on the Porsche engine) position. Air cooling an engine designed to be in the rear of vehicle, now fitted in the front of one, would give not only cooling problems, but interesting handling characteristics – a major accident being narrowly avoided at Oulton Park on its debut. However, Birley's team persevered and it raced numerous times, though often a problem would arise: changing sparkplugs was a tricky operation, fuel consumption was high, and on track its handling was, as mentioned, unpredictable, giving the driver an interesting ride, to say the least. The cost of development, gearbox repairs and the resolving of one problem after another meant that the resources of this small but ingenious enterprise were dwindling rapidly, and the project was halted midway through the 1989 season. The car, minus its engine (which went to a collector in Sweden), went to a fellow Thundersaloon racer who installed a Pontiac power unit. The author understands the Sierra is still around today, sans Porsche engine.

The Porsche 962-powered Ford Sierra of Rod Birley approaches the Druids hairpin corner at Brands Hatch. It looked fairly standard, but the reality was far from ordinary. A brave effort from an ingenious crew sadly came to a halt as funding difficulties intervened. (PC)

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Alpine-Porsche 1974 – a rallying adventure

Those readers who follow rallying will know for sure of the 1973 World Championship-winning marque Alpine. Based in Dieppe, the company produced cars that still have a huge following today. Alpine became Alpine Renault, then in 1972 Renault Alpine, used the power units of Renault, and Gordini whose company had also been bought out by Renault. Jean Rédélé, the boss of Alpine, was famous for making the lightest possible cars, and the Renault engine generally proved to be very efficient. However, one man wanted more power! He was Spaniard Estanislao Reverter, the creator of the Alpinche (or Realpor).

The ‘Realpor’, better known as the Alpinche, was created in Spain at the height of the 1970s rallying boom. Estanislao Reverter, the highly respected rally driver and mentor to new young club rally drivers, set out to create the ultimate Group B rally car before Group B was even thought of, and he succeeded. Estanislao Reverter was born in Orense on 1 October 1929. ‘Lalao,’ as he was known, was a true promoter of motorsport. From 1955 he drove cars as varied as Goggomobil, Renault 4/4, Fiat Abarth 1000 Bialbero, Panhard Dyna, Saab 96, BMW 700, Lotus Cortina, Lancia Fulvia and Alfa Romeo GTA. He decided to set up the Escudería Orense to organise rallies from his own city. One of Estanislao’s obsessions was the weight of his cars. He drilled holes in almost everything! Even the orange paint characteristic of the team’s Porsche 911R was lighter than the paint used by others. He used to say: “You can’t waste a single gram, because a thousand grams make a kilo, and if you save kilos you save seconds.” After the team’s Porsche was irreparably damaged by José Pavón in the Orense Rally in 1970, Reverter had an idea: to create the lightest possible rally car paired with the most reliable and powerful engine – Alpine + Porsche. He acquired the lightest car: an Alpine A110 1300, reg. OR-31516, and fitted a VW/Porsche axle unit to which the most powerful engine was fitted from the wrecked 911. The gearbox differential and suspension were installed where the Renault engine/gearbox had been. Of course, the track and wheel arches had to be modified, but he retained the Alpine Renault front suspension; inside, the seats and the dashboard were changed. Targa, the wheel manufacturer, supplied some special wheels – 7 x 13in for the front and 9 x 13in for the rear, with Dunlop Racing tyres.

Reverter/Rodriguez: the 'Alpinche' became famous during the early 1970s. (Rev)

The car had its debut at the Rallye Rías Baixas in 1971, painted in the orange colours of the Escudería Orense. Below the doors you could read the name its creator thought of giving it: 'Realpor', a contraction of Reverter-Alpine-Porsche. However, the public baptised it 'Alpinche', and that was the name that stuck.

In 1971 it was 3rd in the Rally of Spain, 2nd in the Rallye Bosch de Bilbao and 3rd in the Asturias Rally. On the occasion of the Firestone Rally, Jean-Pierre Nicolas, the famous French rally driver, asked Reverter to let him try the Alpinche. When he got out of the car, he suggested that they should produce it for sale, because it would be an unbeatable weapon for the World Championship! He loved it.

In 1972 Reverter won the Luis de Baviera, Rías Baixas and Asturias rallies, and came 3rd in the Bosch and in the Sherry rallies.

However, towards the end of the year the Alpinche suffered a few incidents, going off the road in the Rallye de España. Then at the 2000 Virajes Rally (2000 Corners), on a neutral section after the rally had already been won, Reverter had to dodge a car which had jumped a stop sign and the Alpinche ended up trapped between the two cement blocks of a roadside railing. He repaired it, and the following year, 1973, he won again at Rías Baixas, was 2nd in the Rallye de España, and 3rd in the Alicante 500km. With rule changes for the 1974 season prohibiting the Group 5 special cars, Reverter could not use it on rallies which counted towards the European Championship, though at the end of 1974 the Alpinche appeared with a new Porsche 2.7 270hp engine in the Costa del Sol, where it finished 6th. There followed many adventures, until a big accident ensued that led to a rebuild and a new design inspired by various aerodynamic solutions that came from a study by a friend at Ligier. Reverter went on to win several events in Galicia, including the Manzaneda hillclimb, and the Rallye de los Pozos. In Orense he is fondly remembered by this superb sculpture in bronze of the donor A110. The famous Alpinche is currently being restored.

NUM. 652 - 7/14 AGOSTO FASCICULO 32 DE 1971 HOMBRE AM7 15 PTAS.

autopista

EL SEMANARIO A TODO COLOR

ALPINE CON MOTOR PORSCHE

The magazine Autopista carried the story in Spain … showing the full details of the conversion. (Rev)

The day that Jean-Pierre Nicolas (left), Alpine factory driver, examined the incredible Alpinche Porsche-powered Alpine Renault. (Rev)

1972 Firestone Rally, Reverter at the wheel. Jean-Pierre Nicolas, the famous French rally driver, asked Reverter to let him try the Alpinche. When he got out of the car, he suggested that they should produce it for sale, because it would be an unbeatable weapon for the World Championship! (Rev)

Estanislao Reverter (R) and Antonio Freire 'Ventura' with the Realpor/Alpinche. (Rev)

The sculpture in Orense: (L) Reverter, (R) Antonio Colemán, a co-driver for Reverter and president of the Orense team for many years. (Rev)

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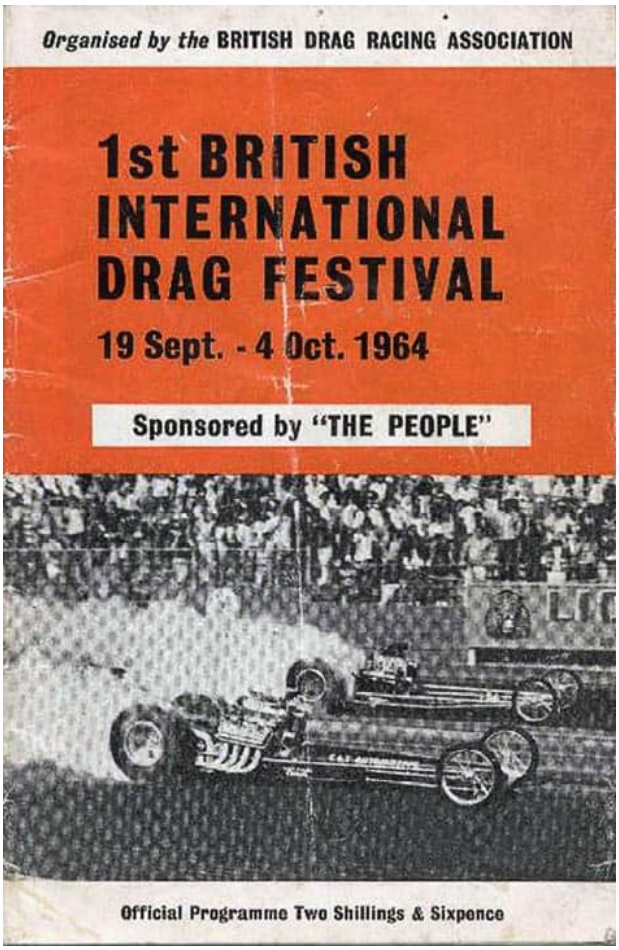
Doug Church-Porsche 1964: a drag racing adventure

One usage of the Porsche engine should not go unmentioned, though unfortunately we have little technical information on this car: this is a Porsche-powered dragster, run by Porsche and VW agent, Californian Doug Church. It appeared at the first British International Drag Festival, run from 19 September to 4 October 1964; one of the early signs of drag racing's popularity in England was that 20,000 spectators showed up for the first meeting. (Author's note: I was there that weekend and saw this car run.) Covered in Jürgen Barth's book Porsche Specials, it featured a modified 356 engine in an installation that was innovative, in that it ran as in a Porsche, with the engine behind the driver, at a time in the 1960s when nearly all dragsters were front-engine. The event was held at Blackbushe Airport, just outside London. Reports say 30,000 people turned up for the weekend of October 4th to see the show. The dragsters from the

USA were brought over by boat – the SS United States – arriving on 1 September, with a second lot of cars arriving on 15 September, for a series of six events. Some serious cars and drivers of the mid 1960s awakened an interest in the UK in this form of motorsport, normally associated with the USA. Today it's a big deal, with a dedicated track at Santa Pod, near Northampton, around 60 miles north of London. A second Dragfest was held on 26/27 September 1965, but it was somewhat spoilt by the weather. The Porsche-powered machine didn't go that year.

As a footnote to the Porsche-powered dragster theme, it is worth mentioning Jack McAfee, who appears in Chapter 2 along with the 'Poopers.' He is also said to have built a dragster in the 1950s powered by a Porsche engine. A report on the Pomona Winter National Drag Race meeting in 1962 mentions three Porsche-powered dragsters, but with little information as to what they were.



Blackbushe, England, 19 September 1964: Porsche and VW agent Doug Church went over to Europe along with several notable dragster top men of the period: Don Garlits, Tommy Ivo, Danny Ongais. Here we see the Porsche-powered 'Modern Specialists' machine named 'Darline's Trouble' (said to be his wife's name), ready to go. Doug's wife and Phil Tenwick formed his crew. (SW)

1964: the Dragster, powered by a 2-litre unblown Porsche four-cylinder 356 engine, run by Doug Church, made three runs up the ¼ mile drag strip all within the 11sec bracket, around 113mph. On 19 September, Don Garlits was fastest on the day with an 8.09sec run (195mph). (SW)

The McAfee dragster from 1962, said in some sources to be a Carrera four-cam engine. (U)

A newspaper cutting from 1962 shows the McAfee Porsche-powered dragster (right). (U)

♦ ♦ ♦ ♦ ♦

Mercedes-Porsche: a desert adventure

In the 1980s, especially on the long-distance rallies like the Dakar or Safari, the chase cars or trucks were vital. Ace Porsche engineer Roland Kussmaul was finding that the Mercedes G-Wagen they were using in 1985 for that year's Dakar, which was fitted with an inline six-cylinder, was low on power, not very practical, and was providing poor driveability.

The ever resourceful Mr Kussmaul had an idea: put a Porsche engine in it – a V8, in fact a 310bhp European-spec, Porsche 32-valve 928S engine, complete with automatic transmission. But it had a modification: the auto transmission did not change gear automatically as a normal auto, but instead, according to Roland, was fitted with a small lever that needed only a push forward or back to change like a sequential box. Fitted with power steering, ostensibly as a service car, it nevertheless was entered at No 3 on the Pharaohs Rally 1985 to support the two twin-turbo Porsche 959s also entered, Porsche using the Pharaohs Rally as a shakedown for the 1986 Paris-Dakar. One of the 959s did not finish due to a fire, but the other one, driven by Al-Hajri/Spiller, took victory. So what, you might think? Porsche wins rally – nothing new there. Aha, but there was: a certain Mercedes G-Wagen powered by the aforementioned Porsche V8 came home in 2nd place! Bravo, Roland Kussmaul!

The Mercedes G-Wagen with its Mercedes engine; the inline six was swapped for the Porsche V8 928, 32-valve unit. (P)

The hero of the hour and the man who was key to dozens of Porsche victories behind the scenes. Great engineer and a really good driver, Roland Kussmaul stands by his Porsche-powered Mercedes G-Wagen, October 1985. (P)

The 959 Porsche readied for the 1985 Pharaohs Rally. (P)

Lada Samara-Porsche: another desert adventure

One might think this an unlikely combination, but for two years there was such a car as the Lada-Porsche. First take a Lada Samara, year 1989, that started out as a mid-engined Samara-Eva. Then obtain a Porsche 959 and its running gear, mix together and there you have it: a top-ten finisher two years in a row on the mighty Paris-Dakar Rally. The Samara S-Prototype was to finish 7th overall on the 11,420km Paris-Dakar Rally in 1990, then 5th overall on the Paris-Tripoli-Dakar in 1991.

The rally-raids adventure was to be a major experience for ORECA, the team run by Hugues de Chaunac, who would build the cars. Lada importer Jean-Jacques Poch facilitated the adventure by supplying the Ladas, using the Porsche flat-six, and parts from Porsche and the 959. Jacky Ickx says in the book *Hugues de Chaunac* – Oreca: “Hugues de Chaunac is for me friendship, professionalism, seriousness. He and his team stand out in the field of motorsport. They have such an open attitude, so passionate, and God knows at times it was extremely difficult. They were always on the side of the drivers, sharing their good and not-so-good moments. The Lada proto was a huge challenge for them. They were starting

off in a discipline about which they knew practically nothing, and yet they were a model of efficiency and reactivity to the mods which had to be made to the car as it developed. We had some amazing times, especially on the Dakar."

Testing in 1989: the Lada-Eva Samara becomes a mid-engine Samara-Porsche. The programme was planned by French Lada importer Jean-Jacques Poch, with the cars being built by the French ORECA racing team. (GB)

The Lada-Samara press release shot of the T3-Porsche of Jacky Ickx/Christian Tarin created in 1989 and raced in the 1990 Paris-Dakar to 7th overall and winning a stage en route. The last win by a Lada had been in the 1986 Tunisia Rally, at the time of the little Nivas. (GB)

On the 1990 Paris-Dakar, Lada Samara-Porsche No 213 was driven by Jacky Ickx/Christian Tarin, who finished 7th overall. The Lada Samara T3 was powered by the 3.6-litre 350bhp Porsche flat-six linked to the four-wheel drive system of the Porsche 959 that had seen success in 1985 and 1986. Oreca team member Jean-Pierre Diot, who was involved in the construction of the Lada-Porsche, has helped the author with the information here on this almost forgotten 'powered by Porsche' exercise. At the beginning, in 1989, a prototype was created that proved very fragile at first. Some components lacked resistance to the ruggedness of the various terrains, notably

the hub carriers. Jacky Ickx estimated that it would take many months to bring the team cars up to scratch at the top level. He was not wrong: in fact it would be a 15-month effort. But succeed they did, and, on the 1990 Paris-Dakar, Jacky Ickx and Christian Tarin, in car No 213, won the Ayoun el Atrous-Tidjikja section on the 458km Nema-Tidjikja stage 17, leading to that 7th place overall in the rally. The 1990 Paris-Dakar also saw a second Lada T3 No 214 in the hands of Patrick Tambay/Dominique Lemoyne, but they experienced engine problems on the 539km first stage, Tripoli-Ghadames, causing a dnf.

In the October of 1990, the Lada Samara-Porsches took a 1-2 finish in the Rallye des Pharaons (Pharaohs). Hubert Auriol/Philippe Monnet were the outright winners. For 1991 Jacky Ickx had been lured away to Peugeot, so it would be Auriol/Monnet, Rivière/Bondenet, Tambay/Lemoyne who would take up the challenge. Hubert Auriol/Philippe Monnet were in the Lada-Porsche No 210. They were accompanied by Patrick Tambay/Dominique Lemoyne in the No 209, and a third car, that of Jérôme Rivière/Bondenet, car No 211, for the 13th Paris-Dakar (Paris-Tripoli-Dakar), which started on 29 December 1990, and finished on 17 January 1991: 9186km. Auriol/Monnet won stage 3, Ghat-Tumu (681km), and stage 10, the 283km Kiffa-Kayes section of the 572km Kiffa-Tambacounda stage to go on to finish 5th overall at the Rose Lake Dakar finish. This year, Patrick Tambay/Dominique Lemoyne were 7th overall; however the Rivière/Bondenet car No 211 was disqualified after receiving outside assistance.

Hubert Auriol says in the abovementioned work: “I did two events with ORECA. Hugues de Chaunac is an unusual team boss. A perfectionist who does the maximum to satisfy his team and sponsors. With the Lada, his demands were very high and the drivers didn’t always have an easy life. Rally-raids were an event which went against our nature.”

Patrick Tambay says: ‘Of my many memories of ORECA, the Paris-Dakar, with Jean-Jacques Poch, Jacky Ickx, Jérôme Rivière, Hubert Auriol ... we were all very close together in this adventure. Porsche, it has to be said, were not over enthusiastic.”

From the ORECA story we can also hear from the supplier of the cars, Jean-Jacques Poch: “Although it was a lot of money for an importer like me, our budget was small compared with those of constructors such as Peugeot and Mitsubishi. ORECA managed to enter remarkable cars within a very short space of time.” The Lada-Porsche programme came to an end in 1993.

♦ ♦ ♦ ♦ ♦

Motorcycles, planes, boats and tractors – Porsche engine adventures
As we near the end of our study of ‘Powered by Porsche’, which is mainly a story about the racing cars that were Porsche powered, we cannot close the file without a mention of four other areas where the Porsche name and indeed a Porsche-designed engine was to play a role. Each of these mini stories is a taster for what might follow in a work for another time. They deserve a place here to show it has not been forgotten that Porsche had power units not only in four-wheeled vehicles on land, but also on two wheels, on the water, and in the air.

♦ ♦ ♦ ♦ ♦

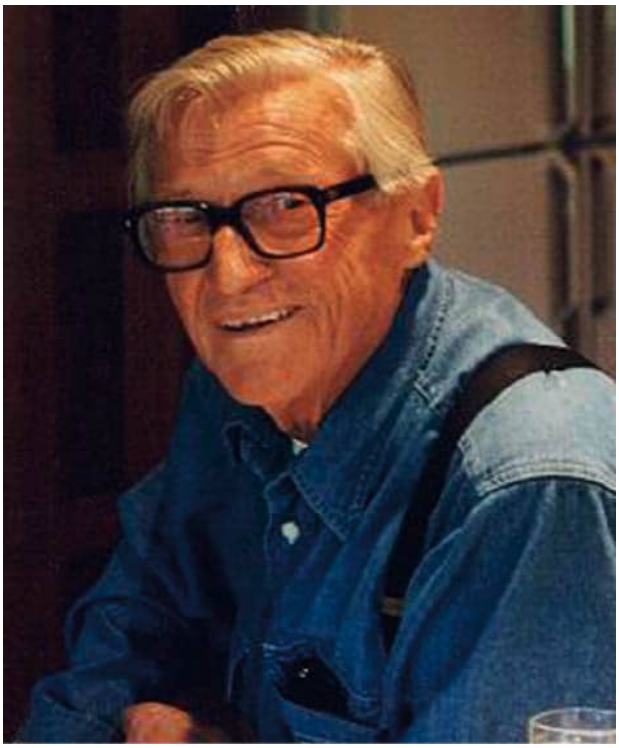
BMW-Porsche: Vasek Polak’s BMW adventure
Vasek Polak was a remarkable man, a legendary Porsche dealer and race car owner. One obituary said: “He was the most enthusiastic racer I have ever known.” His name has cropped up many times in this book in connection with key players in the game, and the cars he was involved with. But he also built an incredible motorbike, powered by a four-cam Porsche Carrera engine.

Born in Prague, Czechoslovakia, he had fought in the Second World War, and is recorded as saying: “I kept a motorcycle in a box in Leipzig during the war. After the war, there was a race in Prague. I won the 250 class. From that day I was racing in every race I could and I won the 250 Championship.”

He went to the USA in 1956, and became a mechanic for Max Hoffman (see Chapter 2). His reputation as a mechanic became legendary, especially as regards tuning the four-cam engine Porsche

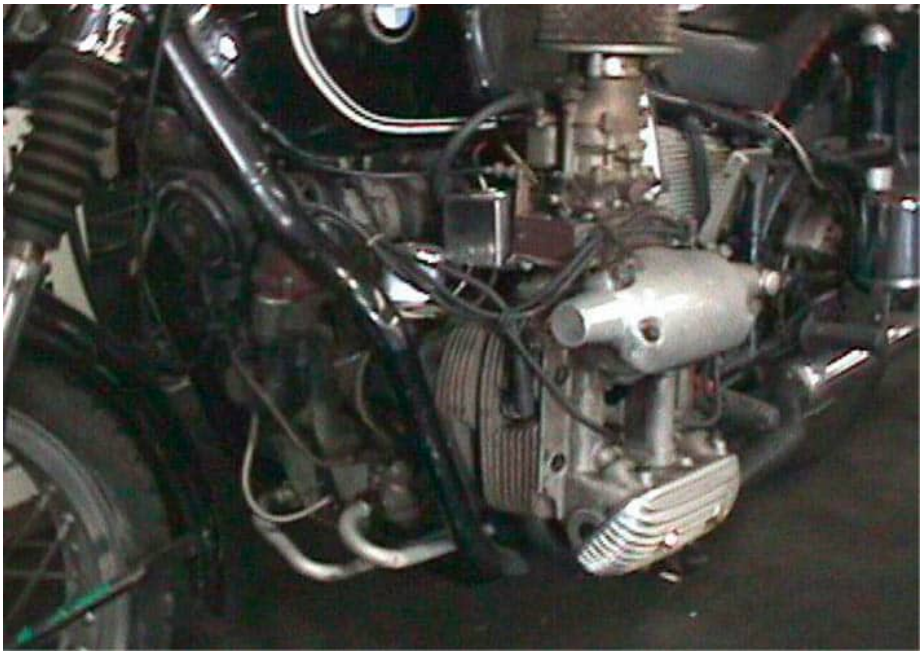
Spyders.

He moved to the west coast of the USA, and by the 1990s, the legend that was Vasek Polak owned six Porsche and BMW dealerships. It was here he created many unique vehicles, among them this four-cam Porsche-powered BMW ...



Vasek Polak, 1914-1997. (WDP)

Vasek Polak's BMW, fitted with the four-cam 1957 Porsche 356A Carrera 547/1 Engine. (WDP)



The engine number is P90846. (WDP)

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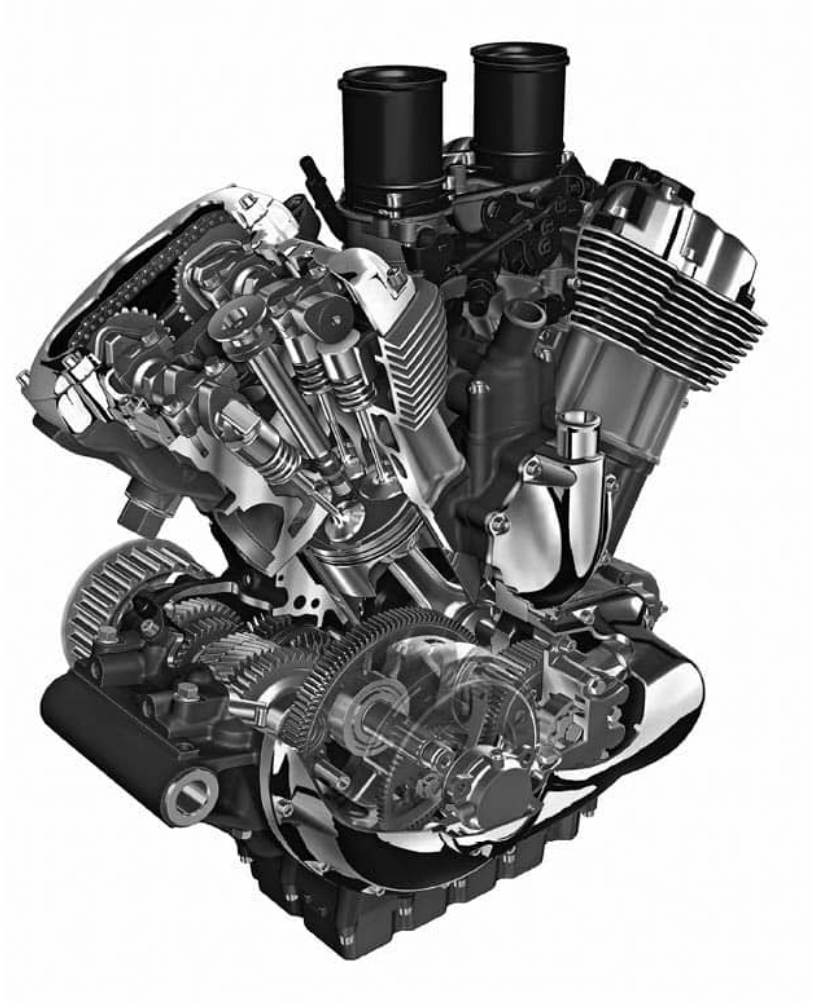
Harley Davidson-Porsche: a motorcycling adventure

The Harley-Davidson VRSC (V-Twin Racing Street Custom) is a model that is generically called a muscle bike. The engine was a jointly developed and engineered Porsche creation. The VRSC was first introduced in 2001, called the V-Rod. The V-Rod Porsche saw Harley Davidson use for the first time a water-cooled engine with overhead cams and liquid cooling. Unlike any other Harley motorcycle, this was a 60-degree V-twin engine; the radiator and the hydroformed frame members support the round-topped air cleaner cover. The fuel tank on the V-Rod is located underneath the seat, placing the rider on top of it, rather than the usual location above the engine. Clearly in the Superbike class, it is thought the idea was for Harley-Davidson to offer a machine that could be used with modifications for drag racing.

The bikes were constructed at Harley-Davidson's Vehicle and Powertrain facility in Kansas City, Missouri, USA. The 1130cc engine produced 115bhp at 8250rpm and 74lb/ft at 7000rpm. It could rev to 9000, but this was really for those wanting to go quarter-mile drag racing. The Porsche engine Harley had a 0-60mph of 3.5sec, reaching 100mph in a little over 8sec. Its top speed approached 140mph.

It was not, of course, the first time a Porsche engine was used in a motorcycle, but it was the first production-run type to be built for a motorcycle. Other one-offs are known to be a Sunbeam S7 that had a 356-type engine, and numerous trike-type motorcycles of recent times that had four-cylinder and six-cylinder engines installed. Those types, though, were mostly specialist one-offs, mainly for road use.



The VRSC's 1130cc engine produced 115bhp at 8250rpm and 74lb/ft at 7000rpm. (P)

The Porsche engine could propel the Harley to 0-60mph in 3.5sec reaching 100mph in a little over 8sec. Its top speed approached 140mph. (P)

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Tractors – an agricultural adventure

Allgaier-Mannesmann-Porsche

In the early 1930s, Prof Dr Ferdinand Porsche was not only working on cars, but had already in hand a design for a low-cost highly efficient tractor, 'for the people.' However, he got sidetracked into other projects! His design was not lost, though. It was brought out again in the autumn of 1945; the war was over, countries had to get back to work, not war. Farming was, of course, essential and farmers needed tractors. The Type 309 engine in the Porsche programme was a small two-stroke diesel engine; it would be suitable for several of Porsche's tractor designs. However, it was parts and equipment to repair those tractors that were still around

that occupied the activities in Porsche Gmund at that time. But they were thinking: maybe the tractors could be built outside of the Porsche organisation which was, as we know, struggling to recover. Allgaier were contacted and indeed began making tractors to the designs that were completed before the war. Allgaier had their plant at Uhingen, Germany. Porsche had produced three prototype tractors in 1934, all equipped with petrol engines because the aforementioned diesel engine, uniquely air-cooled, was not advanced enough for production to commence. In fact, at the time, Porsche had created prototypes ranging from 14hp to 55hp. There were four basic models that would come to light in the early 1950s. Porsche had also foreseen a possible 4WD tractor in 1946. At the close of hostilities, the Allies would only allow the companies in Germany who were producing farm tractors before or during the war to continue. Porsche was not on the list; however, it had found a way round this, and had signed a licensing agreement with the previously mentioned Allgaier GmbH and also an Austrian company, Hofherr Schrantz. They created tractors to Porsche specifications, one called the Allgaier-System Porsche, and the other the Hofherr Schrantz-System Porsche. Allgaier commenced production of the now-famous AP 17 aluminium tractor, with its Porsche-designed two-cylinder, air-cooled, 18hp diesel engine in 1950. Then in 1953 they started production of the ‘Green’ Allgaier-System Porsche tractors of 11hp, 22hp, 33hp, and 44hp.

1953/1954: 535 – Allgaier plant tractor with carburettor (AP 111). (P)

A line-up of Allgaier-Porsche diesels on 21 February 1956; from left to right: pump unit and types A 111, AP 16, AP 22, A 133, A 144. (P)

Allgaier-System-Porsche tractor, still drawing attention in today's world, here at the Birmingham (UK) Classic Car Show, 2016. (RS)

A Mannesmann-constructed Porsche 'Standard' on Porsche property in Zell-am-See, Austria, circa 1961. (P)

In 1956, Mannesmann AG wanted to go into tractor manufacturing, and acquired a deal for the licence to build the Porsche diesel engine design and the Allgaier tractor design. Working out of an old Zeppelin factory west of Friedrichshafen, they were to build a new facility incorporating the latest ideas of the time. Porsche-Diesel tractors were to be produced at this plant until the end of 1963. Mannesmann was to build a new range of tractors powered by Porsche: a Junior, Standard, Super, and Master (14hp, 25hp, 38hp, 50hp respectively). It is said that over 125,000 tractors were made by 1963. Mannesmann even had a division of their company named Porsche-Diesel Motorenbau GmbH. Production ceased when the factory was acquired by Motoren- und Turbinen-Union (MTU)-Daimler to produce large diesel engines for NATO tanks. Renault International then took over the licence for servicing and maintaining the Porsche-powered

tractors worldwide.

Aircraft powered by Porsche

At the very beginning of our story we saw mention of a shallow V engine designed by Professor Dr Ferdinand in 1912, one of several engines he had created for the early aeronautical pioneers. This forerunner, maybe, to the famous flat-four VW, demonstrates that it was not only car engines that go back to the dawn of a new age: the history of Porsche and aero engines also goes back almost to the birth of the aeroplane. Whilst technical director at Austro-Daimler, Ferdinand Porsche, had created a department for aircraft in 1908. Porsche and his team took a close look at the Wright brothers' engine which developed 16hp in 1905. However, it was for a Parseval dirigible balloon that the first engine was built. The Ferdinand Porsche-inspired Austro Daimler unit was mounted vertically in a steel tube under the dirigible. The performance interested the Austrian army, and two more engines were built. The Parceval airships, built to a non-rigid system, were quite successful (for information, the then-current Zeppelins were made of a rigid construction). Porsche himself took several flights. In 1910 the first engine for an aeroplane left the Wiener-Neustadt workshops, even though at the time Austria had no aeroplanes! But it would not be long, and in 1912 an Austro Daimler four-cylinder 65hp engine was fitted into an Etich III Seagull aeroplane.

1911: Ferdinand Porsche (in foreground) alongside the plane created for the Austrian Motor-Aircraft Gmbh (from 1915: Österreichische Flugzeugfabrik Aktiengesellschaft, Oeffag) based in Wiener Neustadt. (P)

By the end of 1913, it is said that 102 planes had been built, putting Austria 6th in the world for production at that time. Apart from the shallow V almost flat-four that Ferdinand's team had brought out in 1912, by the end of the First World War he was creating 300hp V12 engines. It was for his work on aero and automobile engines that the technical university in Vienna conferred on him an honorary doctorate. He even created an interesting V-type engine with three rows of cylinders working off the one crankshaft, featuring three overhead camshafts: the centre one drove the propeller, whilst the two outside cams powered the machine guns, with an interrupter gear to enable the guns to fire through the propeller. However, he would cease work after the war on aircraft engines, until 1924, when he replaced Paul

Daimler at Daimler in Stuttgart. Then he developed a two-cylinder boxer engine of just 22hp – tiny, one might think, but in fact one Baron Karl von König-Warthausen flew round the world with one powering his Klemm L-20 aircraft. Porsche continued to be involved in aircraft engines during the 1930s, too, in particular with a contract from 1935 to 1937 for DVL in Berlin and Sud-Bremse in Munich – water-cooled engines of 12, 16, 20 and 32 cylinders! One of the 12-cylinder units and the 32-cylinder unit produced over 1000hp; the Type 72 was even supercharged. The engine types were 51, 55, 70, 71, 72, 73 and 74. There was an aircraft type of the four-cylinder Volkswagen engine that was foreseen to go into the third Reich's Horten Flying Wing development aircraft.

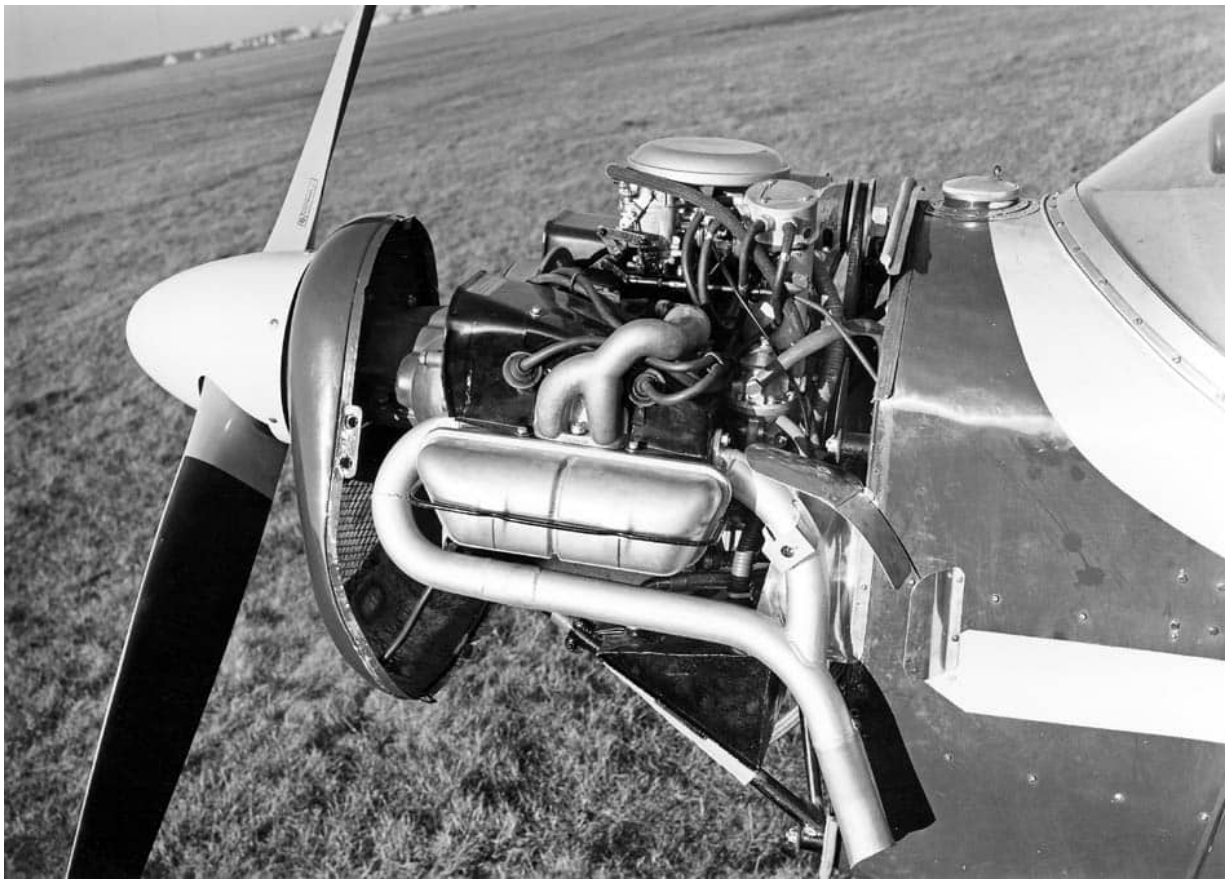
Post-WW2 Germany was forbidden to build planes, and it would not be until 1955 that the Porsche Company built an aero version of the 1582cc Type 678 engine. It was now Ferdinand's son Ferry, already involved with the earlier projects, who turned once more to aeroplane power. The Porsche 356 engine was the plan and the Type 678 ultra reliable unit was to be put into an aircraft.

The amazing Horten Flying Wing development aircraft of 1944, destined to use one of the Porsche-designed Type 247 engines. Many decades ahead of its time, when one considers today's stealth fighters. The final part of this project was not completed, due to allied intervention. (P)

Here we see a Jodel Bébé aeroplane in 1956 on the airfield in Echterdingen. The plane was powered by an aircraft type 678 Porsche engine. At the front of the plane stands Huschke von Hanstein. In the aeroplane, one Karl-Heinz Martin from Saarbrücken. (P)

In 1955, when Germany was again officially permitted to build aircraft engines, Porsche started to look at power for a helicopter, and in 1957 created the Type 702 engine for a lightweight helicopter, called a Gyrodyne, which was even tested by the United States Marine Corps. The engine best suited to the aircraft application at the time was the Type 678/4, producing 75bhp. In the helicopter version it would be installed vertically in the frame. Several light aircraft manufacturers had begun adapting the air-cooled Porsche 678 engines, and in fact Porsche decided to cooperate, building a series of factory-built engines between 1957 and 1963.

As we have seen, a Porsche-engined plane had flown round the world many years before, but to do this again in the modern era would not have been further from Ferry Porsche's mind. It was about to happen, though it would take over six months, 300 take-offs and landings and 600 flying hours, for Michael Schultz/Hans Kampik, who were the pilots to fly their Mooney 231 on that adventure. In June 1985 they took off from the tiny Donaueschingen airfield. They were to experience freezing storms over Alaska, heat in New Guinea and, it is said, "Overzealous narcotics officers in Ecuador, then extremely jittery military personnel in the air space above Angola." They arrived home in a snowstorm after the 100,000km circumnavigation of the world. The Mooney 231 was powered by an aviation version of the 911SC 3.2-litre Porsche engine, listed as the PFM 3200. It is recorded that they had used 23,000 litres of premium fuel and 30 litres of oil – a far cry from the start of the flying Porsches.



Here in 1957 we see another Porsche Type 678 engine installation. (P)

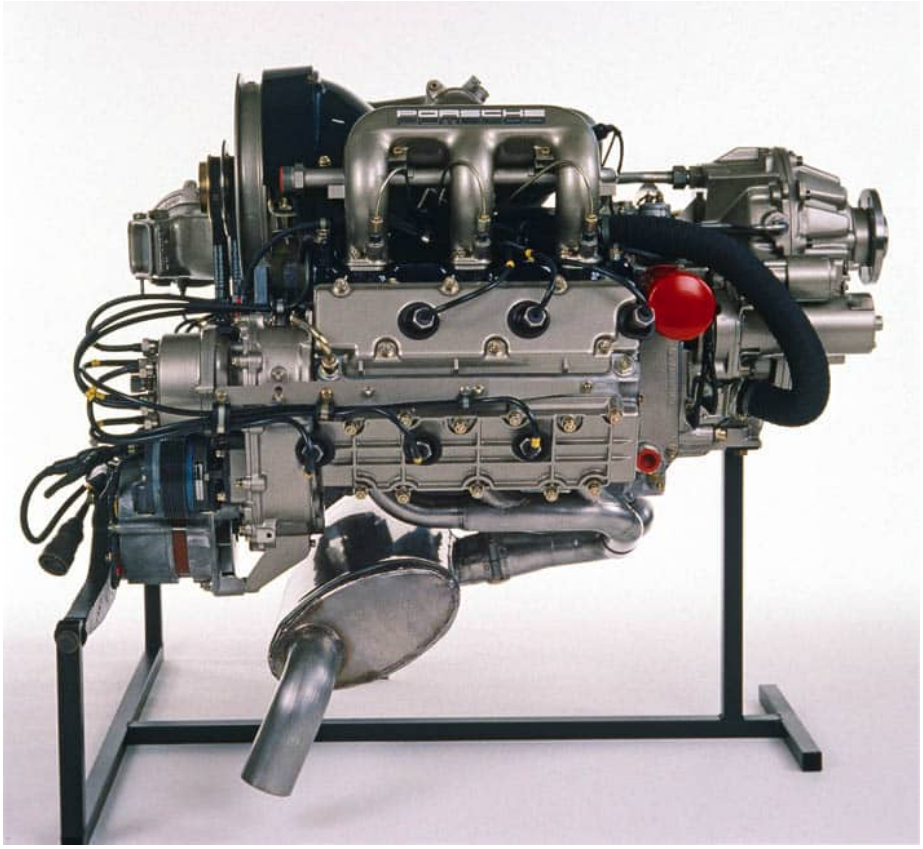
British company Airship Industries, who in 1976 had started development on the Sky Ship 500. This airship had set out on its maiden flight in 1981, powered by two Porsche Type 930 turbo engines. (U)

When Peter Schutz joined Porsche as CEO in 1981, aero engines were just a memory, apart from the ideas of the British company Airship Industries, who in 1976 had started development on the Sky Ship 500. This airship had set out on its maiden flight in 1981, powered by two Type 930 turbo engines.

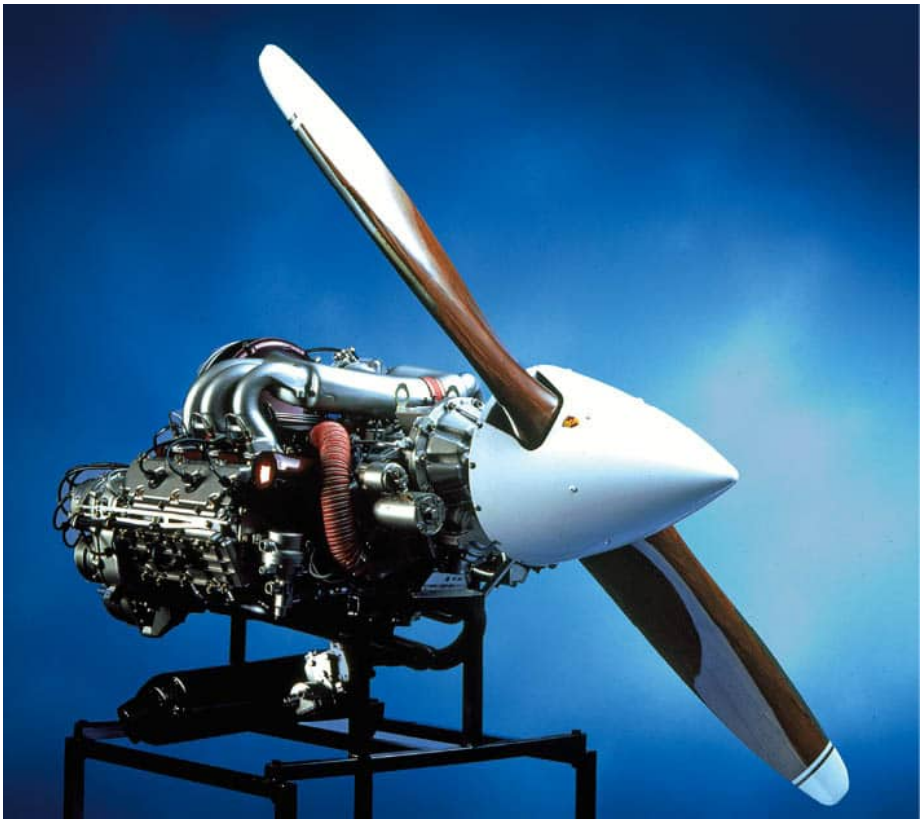
However, with the arrival of Peter Schutz, the potential arose within the company to produce a specific aircraft engine. Schutz had grown up in the USA, and came to Porsche after a career at the Cummins Engine Company and Klöckner-Humboldt-Deutz; he was a passionate aviation man. Porsche was struggling at this time with cars sales, and whilst the 924 was selling well, and the car and its derivatives would save the company financially, Schutz turned his attention to the area of aero engines, with the plan that this would give Porsche an entry into more markets.

An aero engine team was put together under Heinz Dorsch in 1981.

An engine was developed using gears instead of chains to drive the cams, dual ignitions and independent cooling by fans with a special Bosch fuel-injection system, K Jetronic aircraft engine spec system. The engine, called the PFM 3200, first flew in a Cessna. A maintenance facility was created at Stuttgart airport, and work commenced on gaining airworthiness certificates, etc. On 8 August 1982, a Cessna 182 Skylane became airborne from the Mindelheim-Mattsies airfield, south of Ulm in Bavaria. Its power plant was the Porsche PFM 3200; its mission was to complete the approval programme for the new aircraft engine. The Porsche engine received that approval in 1984, and from the American FAA in 1985. It was then that the team decided on the aforementioned round-the-world challenge – a marketing exercise to demonstrate the abilities of Porsche.



1985 version of the PFM 3200. (P)



1988: the 3.2-litre flat-six aero engine type PFM 3200. (P)

Porsche Development Centre in Weissach had two test prototype planes, based on the Cessna Skylane model planned to be the official Porsche factory aircraft. They would complete hundreds of flight hours and thousands of ground testing hours. D-EGMT ended up being the only official Porsche test prototype plane in the world. The chief test pilot was Heine Neumann, today retired; he flew about 300 hours on D-EGMT.

Porsche Panorama magazine, in August 1987, reported that the performance figures were exciting, with 245hp available on the Turbo Carrera engine and an airspeed of 220 knots. They also reported, though, that final certification for public use was still several years away. However, American aircraft and engine manufacturers (Lycoming, Continental) didn't exactly want a German car engine in their American light aircraft market, though Porsche did eventually make an agreement in 1988 with Mooney Aircraft Company, and around 40 or so Mooney planes were sold to private customers.

Today, it is thought, there are only around 22 Porsche-engined planes throughout the world still flying.

1987: the PFM 3200 complete aeroplane by Porsche. Two test prototype planes were built based on the Cessna Skylane model, planned to be the official Porsche factory aircraft. (P)

(L-R) The PFM 3200 Mooney version; the 3200 Porsche-created Cessna-like non-turbo version; the 3200 Mooney turbo-powered version. (P)

In spite of its acknowledged technical capabilities, the aircraft engine was not an economic success. The market forecasts were proving wrong, and by the end of the 1980s sales of small aircraft in the world generally were in decline. PFM 3200 was in the wrong place at the wrong time, and sales of aircraft with the Porsche engine (Cessna, Robin, Mooney) amounted to only 80 units.

Porsche, though, was appealing to the enthusiasts and sport flyers, and was pretty much the only new thing in a stagnating arena. Although marketed for only a short period, the PFM 3200 was to capture the imagination of a few flyers, but the reality was that it was not a mass-market seller. Production came to an end in the 1990s; Peter Schutz had left in 1986. The Porsche Mooney was the best to come out of the project that began in the mid 80s, and produced 41 long-body Mooneys in 1988 and 1989. Peter Schutz had wanted

Porsche to become an international aeroplane engine manufacturer; they tried, but it didn't happen.

In September 2007, Porsche informed the Federal Aviation Administration (FAA) that it was surrendering the type certificate for the PFM 3200 engine, and that it would no longer support the engine. In March 2009, the United States FAA issued a special airworthiness information bulletin, stating that type certificates for existing aircraft with the PFM 3200 engine were still valid and would remain so as long as the aircraft meet Federal Aviation Regulations maintenance and operation requirements.

Turbo-powered aircraft engine: the 3200 in 1987, the turbo clearly visible under the engine. (P)

A Mooney M20 aeroplane manufactured by the Mooney Airplane Company. It was powered by a Porsche PFM 3200 six-cylinder horizontally opposed air-cooled aircraft engine, developed by Porsche from the 911 3.2-litre. (P)

The Mooney Aircraft Company Porsche-powered long-running and successful M20 Type. (P)

Porsche Aircraft Engine Construction 1909 - 1985

Year	Manufacturer	Porsche Type	Performance hp @ rpm	Cylinders Style Cooling	Valves per Cylinder	Bore & Stroke mm		Displacement cc	Weight kg
1909	Austro-Daimler		40/45 @ 1450	4 R W	2	120	100	3800	75
1909	Austro-Daimler		35/40	4 R					
1910/12	Austro-Daimler		65 @ 1350	4 R W	2	120	140	6300	105
1910/12	Austro-Daimler		120/130 @ 1200	6 R W	2	130	175	13,900	200
1910/12	Austro-Daimler		40 @ 1450	4 R W	2	100	120	3700	75
1910/12	Austro-Daimler		90 @ 1300	6 R W	2	120	140	9500	165
1912	Austro-Daimler		90	4 B L	2	220	120	10,000	
1914	Austro-Daimler		120 @ 1200	6 R W	2	130	175	13,900	190
1914	Austro-Daimler		100	1	5				
1915	Austro-Daimler		160 @ 1300	6 R W	2	135	175	15,030	288
1915	Austro-Daimler		300 @ 1300	12 V W	4	135	175	30,060	460
1916	Austro-Daimler		185 @ 1400	6 R	2	135	175	15,030	298

1917	Austro-Daimler		200/225 @ 1500	6 R	4	135	175	16,000	310
1917	Austro-Daimler		ca 350 @ 1400	6 R	4	180	180	27,500	
1917/19	Austro-Daimler		300	9	4			10,900	
1918	Austro-Daimler		345/400 @ 1400	12 V W	2/4	135	175	30,060	465
1918/19	Austro-Daimler		280	6 R	4			18,500	
1935/36	Porsche	51		1	2				
1935	Porsche	55	1000	12 V W	3				
1935/36	Porsche	70	1037	32 X W	2	86	95	17,650	
1935/36	Porsche	71		4 X W	2				
1935/36	Porsche	72	ca 900 @ 3700	16 V W	2	112	125	19,700	452.8
1935/36	Porsche	73		2 V W	2				
1935/36	Porsche	74		4 X					
1937	Porsche	78		20 V W	2				

1944	Porsche	247		4 B L	2				
1955/60	Porsche	678/0	65 @ 4500	4 B L	2	82.5	74	1582	110
1955/60	Porsche	678/1	65 @ 4500	4 B L	2	82.5	74	1582	106
1955/60	Porsche	678/2	50 @ 3500	4 B L	2	82.5	74	1582	95
1955/60	Porsche	678/3	52 @ 3200	4 B L	2	82.5	74	1582	79
1955/60	Porsche	678/4	75 @ 4600	4 B L	2	82.5	74	1582	114
1956	Porsche	702	72 @ 4200	4 B L	2	82.5	74	1582	86.6
1967/72	Avco Lycoming	1871/1954	280 @ 4500	4 B L		130.2	82.6	5399	163
1967/72	Avco Lycoming	1871/1954	400 @ 4500	6 B L		130.2	82.6	6598	188
1967/72	Avco Lycoming	1871/1954	570 @ 4500	8 B L		130.2	82.6	8798	236
1977	Porsche	2554	204 @ 5900	6 B L	2	95	70.4	2994	213
			250 @ 5200	6 B L	2	97	74.4	3299	250
1983	Porsche	3200/933	210 @ 5000	6 B L	2	95	74.4	3200	200

Style: R = Rotary, B = Boxer, V = V-motor, X = X-motor Cooling: W = Water-cooling, L = Air-cooling

Aircraft engines which had the hand of Porsche in their genes. (P)

Boats powered by Porsche

Porsche engines were also successfully used in boats from early in the 20th century. By the 1920s, the boats of Austro-Daimler had evolved to impressive and beautiful craft, as we see here.

1920 on the Danube: motor yacht 'Argonaut' with a 220hp Austro-Daimler six-cylinder boat engine; aboard the boat is owner Ing Theo Weichmann. The engine and boat bodies of the motor yacht 'Argonaut' were built under the direction of Ferdinand Porsche in Wiener Neustadt near Austro-Daimler and the OEFFAG (Austrian Airplane Factory). The 'Argonaut' had berths for four persons. Length: 14.81m; weight: 6500kg; engine power: 220hp at 900rpm; speed: 22 knots (40.7km/h); action radius: 500 nautical miles. (P)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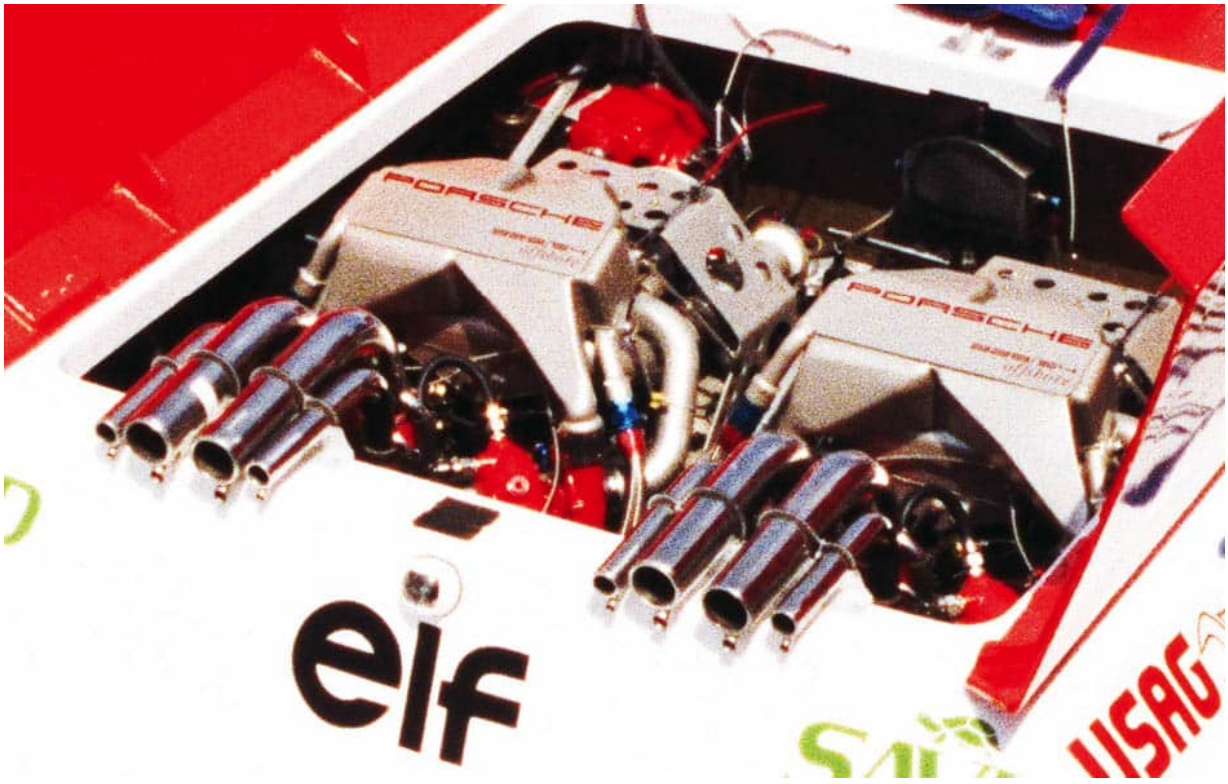
PORSCHE
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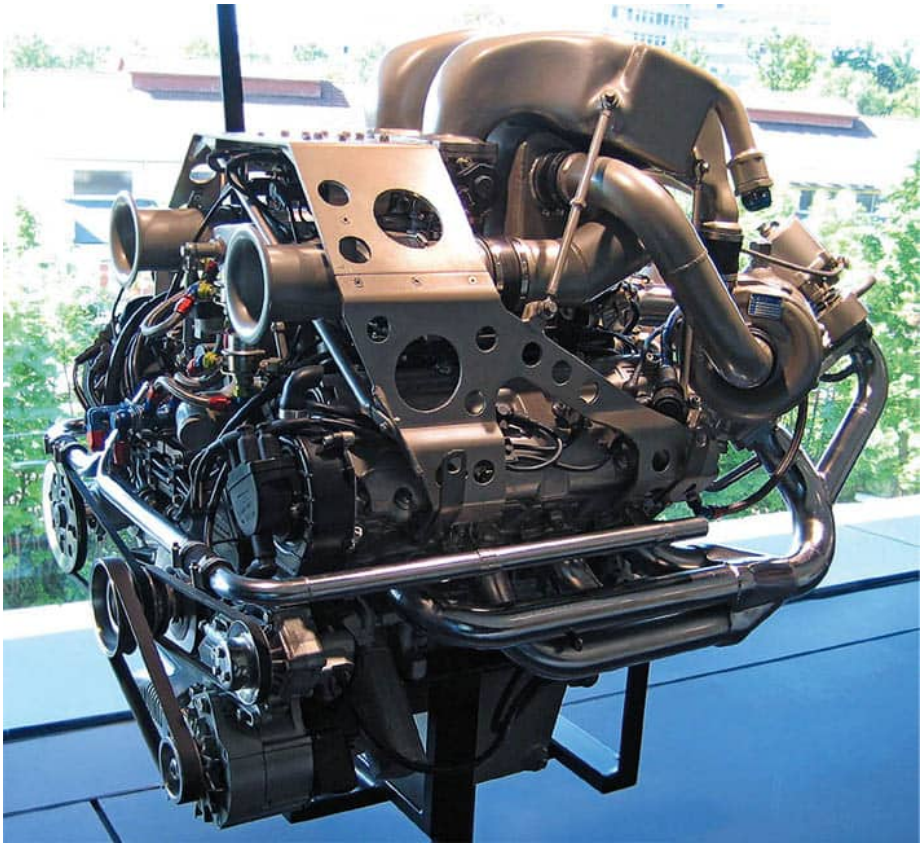
The Sun International 5 powerboat used two Porsche 5.0V8 bi-turbo engines. (P)

In 1958 a marine engine was offered to those interested in leisure on the water. The type of engine was numbered 729; however, it was not a success. Whilst several people tried Porsche power in a boat over the years, one of the most impressive of relatively recent times (30+ years ago) is the offshore Sun International 5 powerboat, by Tullio Abbate. Its marine racing engine ordered by the boat builder was for Porsche racing driver Jacky Ickx. Created in 1984, it was originally fitted with two Isotta Fraschini engines. Then, in 1987, the engines were changed to Porsche 5-litre V8 twin-turbo Porsche 928 engines, developed for marine use. They were fitted in Abbate's shipyard in Tremezzo by Lake Como. The Sun International 5 powerboat used two Porsche 5.0 V8 bi-turbo engines and Porsche engineers worked for months with them on site.

With the engine weight of 340kg, the power-to-weight ratio looked ideal for competition use. Unfortunately, the 1987 offshore season was not very fruitful for the Tullio Abbate team. Lack of time to develop, money and sponsors saw the Sun International 5 raced offshore only twice that year, at St Tropez and Monte Carlo, and it was unable to prove its potential. The cost of the Porsche V8 turbo-engine was twice the cost of the competitors' engines, while their technology would have been almost impossible to maintain, other than by employing engineers from Weissach each time it went racing. The marine engine was a Type 928.70.



A complex and powerful engine: the 928-70. Its weight of 340kg offered a power-to-weight ratio that looked ideal for competition use. Cost was the problem. (P)

The 'Porsche Kineo 27 Classic' was a serious project supposed to go into serial production in 1993. (P)

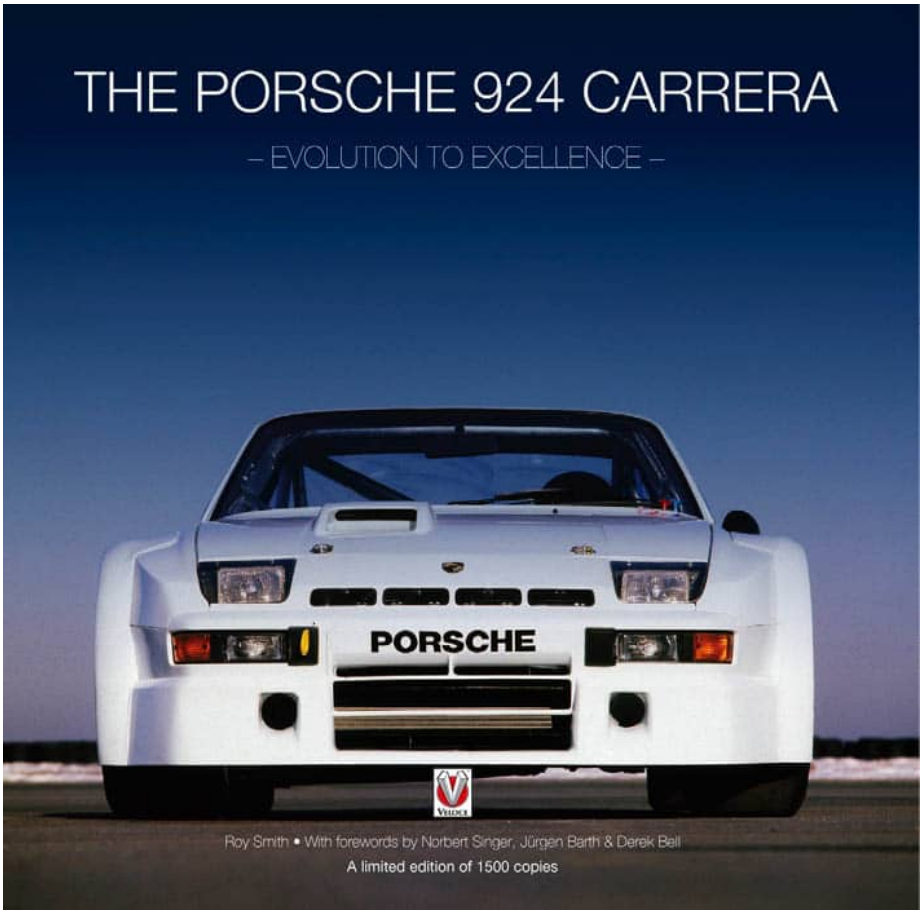
Porsche itself had a dabble at boat design in 1987, when the Porsche Design Studios in Zell-am-See created the example seen here. Originally it was to be powered by two Porsche 928 engines, but in the end the engineers fitted MerCruiser 7.4-litre engines. It is built of Kevlar, carbon fibre and Airex. This beautiful boat exists today, fully restored, in private hands.

It is said that a powerboat in the USA was the inspiration for the Kineo, according to *Porsche Panorama* magazine of April 1989, where they state that a company by the name of Wizeman Marine were involved in cooperation; a boat was created – a Tempest 32 Supersport. Nothing to do with Porsche, other than it was to use two 928 S4 engines similar to those discussed already. It seems that boat builders such as Wellcraft and Tempest already had experience of Porsche power with 928 marine engines, including Abbate, the subject of the preceding item. Another of those 'what might have been' moments!

In the end, only three Porsche Kineo 27 powerboats were built as prototypes. Originally it was to be powered by two Porsche 928 engines, but in the end the engineers fitted MerCruiser 7.4-litre engines. (P)

Here, with that brief look at these other 'powered by Porsche' examples, we reach the end of our study: the study of a remarkable dynasty that is still going, developing even further today. It is sure that Ferdinand Porsche in 1900 could not have imagined that well over 100 years later the influence that he had had on engines would still make his one of the most respected names in motor racing, regular cars, aircraft, and marine engines today. With the return of Porsche to the World Endurance Championship in 2014 we have seen the company heading into a new era of the current hybrid motorsports; that Porsche are already again World Champions indicates that the desire and the ability still exist to influence generations to come. As we bring this work to a close, we can look back, knowing that Porsche was and is still the engine of choice for many alternative race cars and maybe a few other modes of transportation, too.

The end – for the time being …



The Porsche 924 Carrera
Roy P Smith

The 924 Carrera was a homologation model built to qualify the 924 model to race in Group 4. One of the great supercars of the 1980s, the 924 Carrera was considered by many to have better handling characteristics than Porsche's flagship 911.

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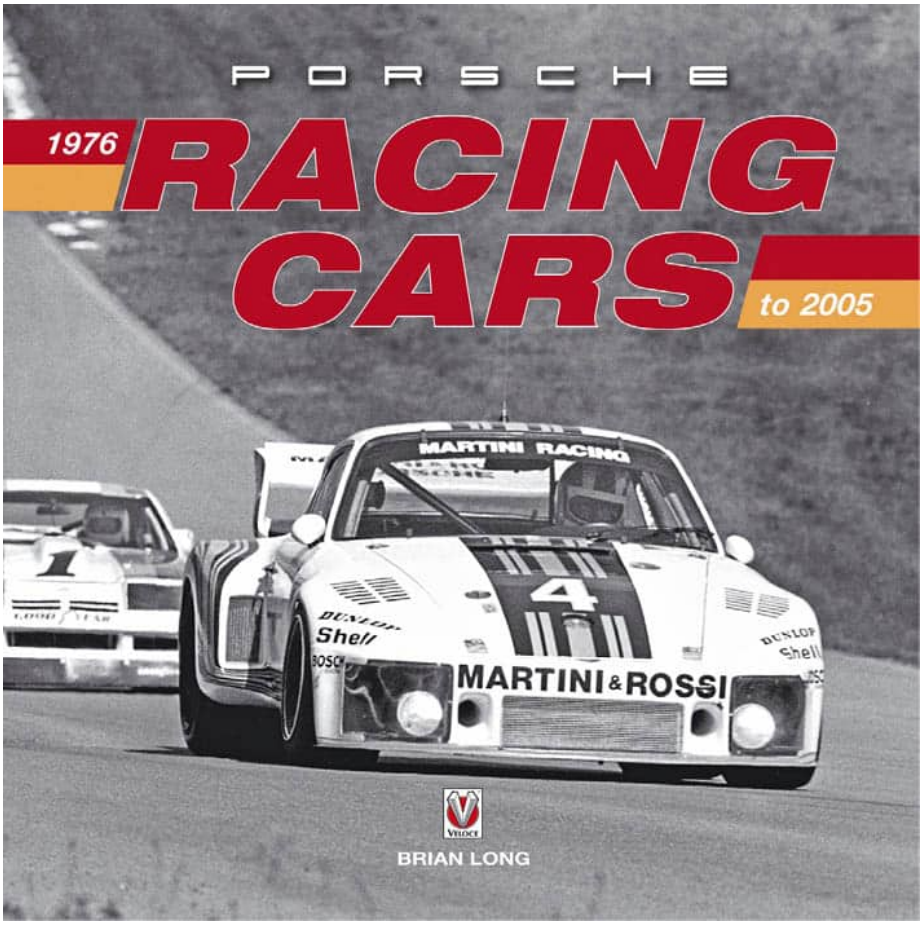
PORSCHE
1976
RACING
CARS
to 2005
MARTINI RACING
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Shell
MARTINI & ROSSI
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Follows Porsche's year-by-year progress in top flight racing, and looks in detail at the pure competition cars which brought the German marque such immense success and worldwide acclaim on the tracks. This particular volume begins with the story of the pure racers of 1976 vintage, and takes the reader, car-by-car, through all of the subsequent racing models, including the glorious 956 and 962, up to 2005. An earlier volume covers the years up to and including 1975.

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