6 Victory

We now come to 1978, and the last – and arguably the greatest – racing achievement in the relatively short history of the Alpine marque (22 years).

Before we go into this momentous final year of competition for the sports prototypes, it is worth considering two developments that have passed almost unnoticed: lubricants and fuel, and the development of the Michelin racing tyres.

First, let's consider lubricants and fuels. Elf Oils had developed a special lubricant for racing and had begun to look at special fuels. In 1976 Jean-Claude Fayard, who was to become the guru of fuels in the 1980s and onwards, had joined Elf as a technical specialist and tells this story: "Back in 1971, François Guiter, whose story is legendary – much of it with Renault, but also with Matra in the early days – asked the Elf research centre at Solaize, near Lyon, to research and supply better lubricants to Renault and the other teams sponsored by Elf to improve the reliability of their engines. Alain Robinet, a young engineer responsible for lubricants, decided to develop a new one on a polyglycol base (polypropylene glycol), a synthetic product possessing very interesting lubricating properties, and also a cooling capacity notably greater than that of mineral oils. But it had a disadvantage in that it was not soluble in mineral oils and even in conventional synthetic oils, so they foresaw problems selling it to the public for road cars. It was called 13000tr [i.e. 13000rpm, implying a rev range].

Renault Sport prototypes: the final year. (©R)

"As this technology was new, Renault insisted on very extensive testing over a period of more than a year. All went extremely well for more than nine months. More and more cars were tested with this miracle product. As I had a Simca Rallye 2 at the time, I myself was part of the test panel. Then to prepare for mass supply, the chemist (Ugine Kuhlmann) went on to do product synthesis in large-capacity reactors (100-10,000 litres). Unfortunately, they found that made in large quantities this synthetic product contained free radicals which during the operation of the engines led to a polymerisation of the oil – no good for the mass market. But the lubricant had a high level of viscosity; that is, its variation in viscosity at different temperatures was less than conventional lubricants (VI> 200), so it was good for racing engines where the oil is changed frequently. Plans for mass marketing and production were cancelled and it was kept for competition use only, and supplied in small quantities. We continued to improve it and it became successful – it was the lubricant used in the Renault Sport cars at the Le Mans 24 Hours in 1978.

"We had also been looking at fuels. I had been put in charge of development that year (1978) and we worked very closely with the Renault team to develop our product further and provide something special for the turbo engine, which up to that time was using standard high-octane fuel. It was the era of leaded fuels and in the competition field the fuel used was aviation fuel type 100LL, octane index higher than 120, which guaranteed problem-free operation for the atmospheric engines in use in those days and even initially the V6 turbo engine developed by Renault Sport. Most of the time it was the organiser who distributed the fuel to all the competitors and it was the obligatory fuel for everyone. But we realised as the turbo was developed that it would be interesting to develop a special fuel.

"André Duval, our engineer responsible for commercial fuels, selected the best chemistry for our product from the refinery at Feyzin to meet the regulations in force. I made my first attempt to formulate a special fuel when I managed to convince the various people in charge at Elf and Renault that

by carrying out an analysis of how the octane levels affected an engine, we could find a way of improving detonation within the combustion chambers, while alleviating the dreaded 'pinking' that was so common in the turbocharged engine and had been a contributory factor in the 1977 failures, yet at the same time staying within the limits of the rules. I eventually found a solution which consisted of adding a small proportion of toluene to the fuel. Renault gave its agreement to proceed with this modification. Regrettably, the development took time and many engines were to break before we could be certain of the correct chemistry and reach the levels of performance we eventually found for the F1 turbo cars in the 1980s. From 1978 to 1983, we developed about forty formulations of fuel which were tried or used in the Renault turbo cars. The 1977 problems, though, had made us study very carefully how the fuel would affect performance in 1978." So although all one saw was the name Elf as a main sponsor on the car, there was most definitely more to that than just the supply of oil and money.

The second development that Renault was able to take advantage of concerned tyres. Pierre Dupasquier, the principal architect of Michelin's sporting ambitions, says: "After 1969, when Renault pulled out of sports car racing with the Alpines, we of course continued to help with the early '70s single-seater programme, but had also gone to other manufacturers and were developing quite a large client base. By the 1974 Le Mans 24 Hours we were supplying no less than six teams. François Castaing and Bernard Dudot had created a very fast, powerful car. In the beginning the 2-litre sports car, although not at the time as powerful as some of the others, had allowed us to work on our compound mixtures, studying distortion of the carcasses and developing our slick tyres, etc. At Michelin, Daniel Chevillard, who had worked with Michel de Reynal since 1970, turned this work to good account by developing new carcasses and profiles which were the origin of a whole new family of products. By reducing the stress put on the various rubbers within the carcass and taking care that they were spread throughout the contact area of the tyre, it became theoretically possible to preserve the integrity of the tyre while achieving much lighter weight, therefore making it much more competitive.

"In the mid-1970s, Renault had been quietly thinking about how to prepare for victory in the Le Mans 24 Hours – its cars were already known to hold the road well and proved eventually to be very fast, easily capable of qualifying on the front row. We wanted to stretch our technology and try new tricks. A lot of work was done, but it was for the 1977 Le Mans 24 Hours that François-Xavier Delfosse was finally given full rein to organise a strictly planned schedule; it included tyre testing on a grand scale, which helped us and the Renault war machine to perform perfectly.

"Naturally, development had been ongoing since 1974, when the prototype cars had begun to run well and won the European Championship. By the 1975 Le Mans, we were well advanced with both qualifying and race tyres, though some apparently didn't think so: strangely, a report in a German magazine had said: 'Renault's decision to develop a turbo engine is interesting. Unfortunately, they use Michelins. A radial tyre will never be able to do anything in competition.' The article predicted that 'on a wet track the forecast would be even worse.' We knew differently [see Pierre's words in chapters three and four] and we were sure that Renault would win Le Mans one day soon. We felt that in spite of all the mechanical breakages, the turbo principle was not in question. By late 1977 the pistons looked as if they would go the distance. Only one shadow hung over the picture: the absence of regular competitions in 1977 and 1978 to test our tyres on the A442s to their limits. However, Renault Sport did go testing in a huge way after the 1977 failure, and we prepared our tyres for them in the hope that the cars would last. The words ringing in the Renault engineers' ears were speed, endurance, reliability. We at Michelin would be ready."

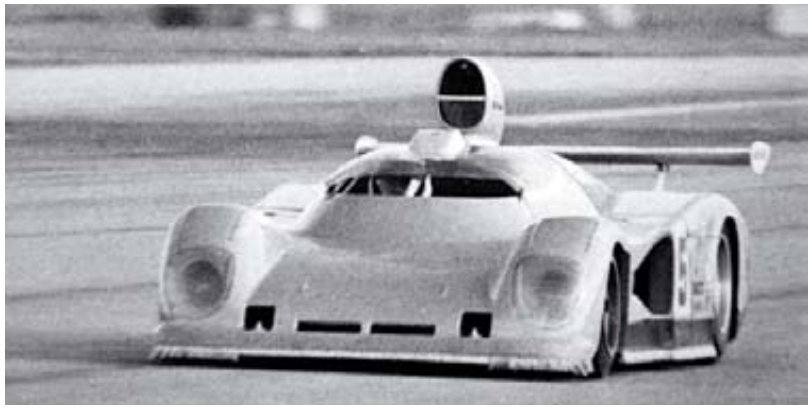
Pierre Dupasquier. (©R)

In the 1960s Jean Rédélé had dreamed of winning the Le Mans 24 Hours. He succeeded in the classes and indexes, and the team at Alpine had achieved much. Many would have been satisfied with those wins as a small-volume car manufacturer, but 'le Patron' wanted outright victory at Le Mans, and with the change in the regulations in 1967 for the 1968 season, he thought that maybe Alpine had a chance with the 3-litre engines. It was not to be, and as illustrated in volume one, the mighty Renault company, which was investing heavily, stopped everything in 1969 after the poor performances and engine failures.

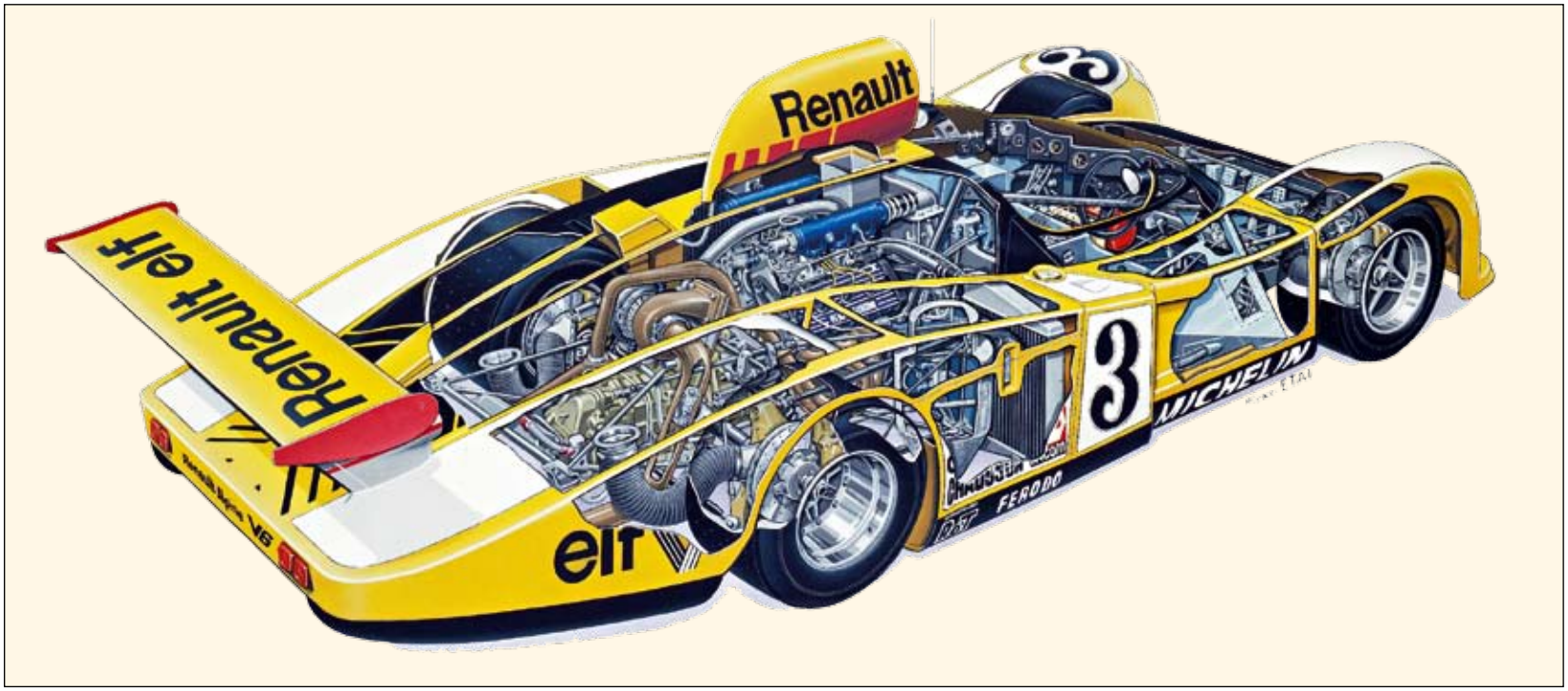
In the seven years following that low point in Alpine history, much had happened. It had won the World Rally Championship, Renault had taken over, a new engine had

been developed, a new sports prototype car had been designed, Renault had revitalised interest, and there was new blood in the engineering team. François Castaing, Bernard Dudot, Alain Marguet and Jean-Pierre Boudy had joined the experienced hands of Marc Bande, Giuseppe Albarea and Igor Bourimoff from Gordini. Aerodynamics had come on leaps and bounds, and Marcel Hubert's expertise had developed into a significantly influential medium to keep the cars on the ground. It had won the European 2-litre Sports Car Championship in 1974. The turbo had arrived and boosted the power of the 2-litre to a level not seen before. The cars were now simply the fastest projectiles in sports prototype racing, proven by the many World Sports Prototype Championship pole positions and fastest laps in 1975 and 1976, and at Le Mans in 1976 and 1977. They were fast – very fast. A new management structure had been put in place by Gérard Larrousse, director of Renault Sport. François Castaing had overall responsibility for the technical side of the organisation, Bernard Dudot for the turbo engines, and François-Xavier Delfosse masterminded the testing and race organisation while Jean Sage looked after logistics. Everything now was specifically and officially targeted towards winning the Le Mans 24 Hours, which even today remains the greatest shop window for marques in the world. It is quite simply the pinnacle of sports car racing – for all classes, not just prototypes.

The late Jean Terramorsi's idea of using a turbocharger had been developed to a level that would soon completely change the world of Grand Prix racing, and indeed the thinking of



A443 – early secret test (no decals), with brush skirt and bubble. (Photo FXD)



The final version. (Image ETAI)

car manufacturers worldwide. Renault was even developing a road car that would become a cult item in later years: the mid-engined R5 turbo.

The sports prototype team entered 1978 determined to win. It had to: the Régie had told Larrousse that it could not support a push forward in Formula 1 until it won Le Mans, and after two failed serious attempts it must win in 1978.

François-Xavier Delfosse: "It was decided that we would build a bigger-engined car. It was top secret, and whilst most people know today, at the time I think only the engineers involved plus Jabouille and Depailler knew. A new chassis was being tested, the A443, and with the turbo rating in the regulations the engine was just inside the 3-litre limit at 2993cc. It gave us 20bhp more and better torque."

After the 1977 Christmas holidays, work started in earnest. Chassis A442-2 and 3 were completely rebuilt for 1978. A442-1 had been rebuilt in 1977, and was renumbered A442-4 for Le Mans (although in the internal records of Renault Sport it is listed as A442-1 throughout). The A442-0 damaged in the fire was restored for testing purposes, but did not run at Le Mans that in 1978. However, in the superb collection of the aforementioned internal documents, there is a copy of an official entry to the ACO for A442-0 with a note attached, saying "In case of accident to either of the other cars ...": it was a spare chassis without engine! Each of the cars was redeveloped to make another challenge on Le Mans. The Paul Ricard circuit at Le Castellet became their virtual home for the next few months.

From the meeting on 12 January, we see in the official note de service 955 a report of the endurance test, and on a separate document presented to the meeting, the cumulative results of the tests at Ricard and TRC in 1977. It states:

At Paul Ricard:
Endurance test 1: 3050.25km

Average speed	167.06kph
Fuel	48.02 litres per 100km
Oil	0.86 litres per 100km

Average speed per driver:

Derek Bell	164.77kph
Patrick Depailler	169.62kph
Jean-Pierre Jabouille	164.85kph
Jean-Pierre Jaussaud	168.85kph

At TRC, USA:
Endurance test 2: 1137.40km

Average speed	257.92kph
Fuel	48.19 litres per 100km
Oil	1.14 litres per 100km

Average speed per driver:

Derek Bell	260.10kph
Jean-Pierre Jabouille	255.86kph

Endurance test 3: 883.3km

Average speed	254.66kph

Driver Jean-Pierre Jaussaud, using 49.05 litres per 100km, 3.74 litres of oil per 100km

Totals:

Km	5710.00
Average speed	194.02kph
Fuel	48.25 litres per 100km
Oil	1.42 litres per 100km

Planning preparation notice Le Mans 1978 (from personal record of FX Delfosse)

– Organisation chart – operations defined (except for chrono teams, signalling and admin)
– Allocation of cars by team after test number two (select drivers for each team)
– Training of teams one and three from 1-3 Feb
– Training of teams three and four in April
– Training sessions
– Book Ricard for 27 March to 2 April
– TRC 11-14 April – possibly
– Last week April to first week May: run-in gear boxes, gearbox training for mechanics and maybe training at Croix-en-Ternois, to be decided

Next test session:

– Delfosse to call Pironi/Jarier Thursday morning
– J Sage has been contacted by Delfosse for admin
– No driver's car radio for testing
– Deliver gearbox to Dieppe beginning of week 23 Jan '78
– Engine ditto 23 or 24
– Chassis problem – rack – clutch

A443:

Aerodynamic tests with several heights of wing, either weekend 26 Feb or 5 March. With large exchanger. Send memo for test at Istres (military airfield) to GL. With new engine, plus testing long chassis + 150mm