

# Press kit

# RENAULT : A TURBO SAGA FOR 40 YEARS

July 15, 2019



## From track to road, the turbo according to Renault

To celebrate the 40th anniversary of the Formula 1 victory of the first turbo engine, Renault invites you to discover, or rediscover, an exceptional range of turbocharged vehicles. From mythical sports cars to iconic production models, the turbo engine saga has been driving the performance of cars on and off the track for 40 years.

The carmaker is celebrating the 40th anniversary of its first Formula 1 victory, the first by a turbocharged engine. The show is a chance to find out more about Renault's central and pioneering role in the introduction and use of turbo engines in Formula 1 racing as well as the transfer of this technology from motorsport to production vehicles.

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# 01

## Supercharging history



Renault sees motorsport in general, and Formula 1 in particular, as a laboratory and showcase for its technological know-how. In addition to Renault's passion for sporting challenges and its taste for victory, motorsport is a fantastic opportunity for developing leading-edge technologies that later benefit production vehicles, either directly or indirectly.

Since 1977, Renault's Formula 1 commitment has made it a major player in the discipline, recognized not just for its titles but also for the innovations featured on its single-seaters and those that it has powered to success. It all began with the famous turbocharged V6 engine fit on the Renault RS01, which stood as a complete revolution at the time. Once the novelty, initial hitches and jeering were over, success came fast. July 1, 1979 marked a true turning point in the history of the turbo, with Jean-Pierre Jabouille winning the French Grand Prix in his RS 10 on the Dijon-Prenois track and bringing Renault its first victory in the Formula 1 World Championship. René Arnoux's third-place finish, after a Homeric battle with Gilles Villeneuve in his Ferrari 312T, rounded out the success of the young team. Renault had revolutionized motorsport. For the first time, a 1.5 liter turbocharged engine had triumphed over the traditional normally aspirated 3.0 liter powerplants competing in the premier class competition. The victory at the 1979 French Grand Prix was the first in a long series of triumphs for Renault, which has notched up 177 wins and 507 top-three finishes in the category (chassis and engines).

The heritage of this major innovation having revolutionized Formula 1 continues today, as seen in the return of the V6 hybrid turbo engines to Formula 1 in 2014. This achievement pays testament to Renault's vision. By taking up the challenge of the new regulation, Renault has drawn on all of its expertise as a Formula 1 engine supplier to further technological innovation. This is a major advantage for its production models, and has been for 40 years now.

*"The idea of transferring the turbo technology used on trucks, notably in the United States, to Formula 1 competition is without a doubt one of the boldest, and also most visionary, ideas in the history of motorsport. Transposed to high-volume production cars, the turbo has become part of our everyday lives and a symbol of power, speed and progress."*

**Cyril Abiteboul** - Managing Director of Renault Sport Racing

# La suralimentation, un principe breveté par Louis Renault

RÉPUBLIQUE FRANÇAISE.

OFFICE NATIONAL DE LA PROPRIÉTÉ INDUSTRIELLE.

## BREVET D'INVENTION

du 17 décembre 1902.

X. — Carrosserie.

5. — AUTOMOBILISME.

N° 327.452

*Brevet de quinze ans demandé le 17 décembre 1902 par M. RENAULT (Louis), pour perfectionnements aux moteurs à quatre temps. (Délivré le 28 mars 1903; publié le 24 juin 1903.)*

Improving the yield of an engine by optimizing the quantity of the air filling its cylinders is not a new idea. The principle of supercharging that later gave rise to the turbocharger was devised back in 1902 by Louis Renault. In that year, he filed an [invention patent](#) on the means of “increasing the gas intake pressure in cylinders [via] a fan or a small compressor”.

After the Second World War, the compressor, and above all the turbocharger, the reliability of which had been improved, were used widely on the large diesel engines of locomotives and heavy goods vehicles.

The turbocharger made its appearance on Renault engines in the early 1970s.

An Alpine A110 group 5 was fitted with a turbocharged engine in 1972. Despite a lengthy lag time, Jean-Luc Thérier drove the car to victory at the Critérium des Cévennes race in that same year.

But things really got serious on the track in 1975, with the A441T endurance prototype, followed by the A442, A442B and A443, with a victory by the Jean-Pierre Jaussaud/Didier Pironi team at the Le Mans 24 Hours in 1978.

Renault then set its sights on a bold new goal: to win the Formula 1 with a 1,500 cm<sup>3</sup> turbocharged engine competing against the conventional 3.0 liter normally aspirated engines.

The turbocharger today is used on a majority of Renault's production cars consistent with the current trend towards downsizing or “rightsizing”. Equipping an engine with a turbocharger reduces or maintains the capacity of an engine while increasing its power and limiting fuel consumption and pollutant emissions.

# 02

## Legendary motorsport vehicles

The transfer of technology from F1 to production cars is embodied by a selection of models selected by Renault Classic\*. Renault is celebrating the 40th anniversary of its first, revolutionary Formula 1 victory, a 1979 RS 10 together with a selection of emblematic production cars. These models show how Renault, starting in 1980, transferred the technical expertise in turbocharging acquired in motorsport to its production range. The 600 m<sup>2</sup> stand is home to 11 Renault models equipped with a turbo engine. In addition, an Estafette – a model celebrating its 60th birthday in 2019 – adorned with the colors of the 1979 Formula 1 team is serving as a store.

### RENAULT F1 RS 10 – 1979

Jean-Pierre Jabouille claimed Renault's first Grand Prix victory in 1979 on the Dijon-Prenois track in France at the wheel of the RS 10. It was the first Formula 1 win by the Renault-Gordini EF1 engine, and the first-ever F1 triumph by a turbocharged engine. The engine in question was a 1.5 liter V6 turbo, the development of which began in the 1975 season. Powering the Alpine A441 endurance prototype, it made its debut on the Paul Ricard track. The development of the engine was pursued both on test benches and cars. It made its first Grand Prix appearance at the 1977 British Grand Prix in the shape of a 90° V6 engine with a capacity of 1,492 cm<sup>3</sup> and four valves per cylinder, supercharged from 1979 by two turbochargers. The engine weighed some 180 kilograms with the starter, clutch and supercharger system. The engine was calculated to operate at a speed of 12,000 rpm.

René Arnoux added to the young team's success with a third-place finish after a Homeric battle with Gilles Villeneuve in his Ferrari. Through its drivers and engineers, Renault had revolutionized motorsport, establishing the turbocharged engine as a rival to normally aspirated engines.



## Renault 5 Turbo Europa Cup

The Renault Turbo Elf Europa Cup was the world's first competition for single-make turbocharged cars. It pitted modest amateurs against proven champions at the wheels of cars that were little more than production vehicles.

When it came to market in 1980, Renault 5 Turbo made no secret of its ambition to be the standard-bearer of a brand whose love of motor sport went back to its origins. The "Little Bomb" lived up to its promise. By January 1981 it had won the Monte Carlo Rally with Ragnotti and Andri . Three months later the flag went up on the first Renault Turbo Elf Europa Cup, the successor to the Renault 5 Elf Europa cup. This competition for single-type turbocharged cars consisted of 12 races. Seven were curtain-raisers to Formula 1 Grand Prix races and one to the Le Mans 24-Hours. The Renault 5 Turbo cars thus performed before 80 to 100,000 spectators at every race! They were practically series production cars, which kept budgets down and allowed amateurs to measure themselves against great professionals like Jean Ragnotti and Walter Rohrl. Ragnotti actually finished runner-up in the 1981 season, recording victories at the N rburgring, Monaco and Dijon and numerous podium places.



## Renault 5 Turbo Tour de Corse

Alongside the production model, the Renault 5 Turbo appeared in several competition versions. The first Group B upgrade was christened "Tour de Corse" to commemorate Jean Ragnotti's victory in this event.

The Renault 5 Turbo launched in 1980 had clearly announced ambitions as Renault's flagship sports model. In January 1981, it won the Monte Carlo Rally with Jean Ragnotti and Jean-Marc Andrié, the first in a long string of victories. For 1983 season, a Group B version is produced, named "Tour de Corse",

blowing 285 hp as customer version.

This original "Tour de Corse" Renault 5 Turbo wears the color scheme of French driver Alain Serpaggi's car (racing from 1983 to 1985 in French Rally Championship, 1985 D2 Rallies French Champion).



## Renault 20 Paris-Dakar

Claude and Bernard Marreau left their mark with their valiant little Renault 4 Sinpar 4X4 during the Paris-Dakar rallies of 1979 and 1980. These performances opened up doors for them at Renault, which offered them the opportunity to prepare a Renault 20 for the next rally.

From February 1980, a bare body was delivered which they would cut, strengthen and weld. The front suspension was standard but a Renault Trafic body bottom was grafted to the rear in the rear wheel drive version, with a rigid axle. The exhaust emerges spectacularly from the front bonnet and runs along the windscreen and then the roof. The rear bench seat was obviously taken out and replaced by a 200 litre petrol tank supplying an original

1,565 cc Renault 18 turbo engine, with 110 hp and a 21 mkg torque, connected to a modified five speed gear box, also serving to adapt it to 4X4 conditions.

The car took part in the 1981 Paris-Dakar, but it was in 1982 that the Marreau brothers' Renault 20 turbo 4X4 was victorious.



## Renault Maxi 5 Turbo

The Maxi, final upgrade of the Renault 5 Turbo, pulled off the very tough challenge of standing up to all-wheel-drive rivals.

The uncompromisingly sports-oriented Renault 5 Turbo, released in 1978, had come a long way from its passenger car origins. With its 160 bhp centrally-mounted engine, it packed a potential that successive competition versions would harness to achieve a track record of truly epic proportions. The Maxi was the last in the line of this sporting dynasty. The new "Group B" appeared in 1983, allowed all-wheel transmission. This meant very tough competition for the 5 Turbo, which would never have anything other than two-wheel-drive. The aerodynamic performance of the car was optimized of what was, after all, a pretty square box, adjusting the spoilers, fine-tuning the air inlets, and introducing lightweight carbon parts. The body was stiffened, the suspensions reviewed, and the engine given a further boost, up to 350 bhp. Not only would this be the fastest-ever two-wheel-drive rally car, claiming fine victories in events like the Tour de Corse and Tour de France, in the expert hands of Jean Ragnotti.



# 03

## The turbocharger to production vehicles, supercharging for all

### RENAULT 18 TURBO – 1980

Domesticated for application on a mid-range production model, the advanced turbo technology lent the Renault 18 a quiet force, blending fieriness with smoothness and calm. An uncommon combination of somewhat contradictory qualities made this car a true original as well as a real pleasure to drive.

For sporty driving, it rivaled with the top-performing cars on the market. For everyday use, it was a family sedan with high-end equipment offering a silent and agreeable drive. The model's top speed of 185 km/h testifies to its performance, while its silent operation was achieved by muffling exhaust noise with the turbo.

The Renault 18 Turbo is equipped with a 1,565 cm<sup>3</sup> aluminum four-cylinder engine with maximum power of 81 kW (110 hp DIN) at 5,000 rpm. The Garrett turbocharger is located ahead of the carburetor. Boost pressure is approximately 600 g/cm<sup>2</sup>. In a distinctive feature, the Renault 18 Turbo's engine is boosted by a turbocharger with a "blown" carburetor fed by cooled air. It is also equipped with a knock detector and an electronic ignition control unit.

The Renault 18 Turbo stands apart through its range of original equipment borrowed from the Fuego, including the dashboard, low-profile tires and front spoiler.



## RENAULT 5 TURBO – 1981

The Renault 5 Turbo was seen as the true culmination of the Renault 5 range, launched in 1972 and already available in ten versions. The aim was to realize all of the car's potential in terms of handling and power.

It is equipped with a 1,397 cm<sup>3</sup> engine with maximum power of 116 kW (160 hp DIN) at 6,400 rpm, based on the Renault 5 Alpine powerplant. The T3 Garrett turbocharger has a maximum boost pressure of 860 g/cm<sup>2</sup>.

It was developed as part of a motorsport policy, with Renault looking to return to major international rallies with a vehicle able to top the overall standings. For the first time, the teams did the opposite of a regular program. Considering the Renault 5 Turbo first and foremost as a competition car, they then decided to launch a customer version benefiting from what the engineers had learned in motorsport competition. Unlike the mass-production front-wheel-drive Renault 5 models, the Renault 5 Turbo was driven by the rear wheels for maximum grip.

With Jean Ragnotti at the wheel, the Renault 5 Turbo won the 49th Monte-Carlo Rally in 1981 along with numerous other rally competitions.



## RENAULT 5 ALPINE TURBO – 1981

Before the Renault 5 Turbo, the Renault 5 Alpine (1976) was the most athletic model in the range. It became the Renault 5 Alpine Turbo in 1981. The new model was an upgrade, with a turbo added to its 1,397 cm<sup>3</sup> engine. An intercooler could not be installed owing to a lack of space in the engine compartment. And to keep the price down, the car was not fitted with a knock limit-controlled ignition system. But the turbocharger boosted the performance of the new Renault 5 Alpine Turbo, with power increasing 18% from 93 to 110 hp DIN and, above all, engine torque rising 30% from 108 to 147 Nm. The model reached a top speed of 185 km/h. The only options available were new (Renault 5 Turbo-style) wheel rims and power steering.

The Renault 5 Alpine Turbo thus became the highest-performance small car for sports use on the market. The car's impressive performance does not detract from driving and acoustic comfort. By increasing fill rates at high engine speeds, the turbocharger enables the use of a camshaft favorable to the lowest speeds, mainly reflected in the extreme smoothness of the engine and rounded and stable idling at very low engine speeds (for silence and economy). The turbocharger makes the car a very strong road performer that is also smooth and pleasant to drive in town.



## RENAULT FUEGO TURBO – 1983

Drawing on its motorsport experience and expertise in the large-scale industrial applications of turbochargers, Renault decided to produce a high-performance version of its Fuego coupé in 1980. The model in question was a petrol Renault Fuego Turbo, as the range already included a Turbo D version. The Renault Fuego Turbo features extremely athletic qualities including impressively low drag. It is powered by a 1,565 cm<sup>3</sup> turbocharged engine based on the Renault 18 Turbo's powerplant. The engine is boosted by a Garrett T3 turbocharger with a 32 DIS "blown" carburetor, an electric petrol pump and a petrol pressure regulator.

However, while the Renault 18 Turbo was designed to achieve the best compromise between performance and fuel economy, the Fuego Turbo is all about performance. It features stronger boost pressure and modified ignition and carburetion. An electric fan unit attached to the air-air intercooler and oriented towards the carburetor cool the engine compartment, and the carburetor area in particular, after the engine is turned off. As a result, the engine can start up in the best possible conditions, even when warm.

The Renault Fuego Turbo develops maximum power of 97 kW (132 hp DIN) and boasts a top speed of 200 km/h. An extremely impressive accelerator, it goes from 0 to 100 km/h in 9.5 seconds. The turbo technology used results in silent operation and the stored engine power is delivered in full up to maximum speed. Drivers benefit from the coupé's grip on winding roads as well as its ease on highways. With its extensive equipment (including BBS "honeycomb" alloy wheels, air conditioning and side "Turbo" decals), the Renault Fuego Turbo is a high-end model.



## RENAULT 11 TURBO - 1984

In 1984, Renault fit a Garrett T2 turbocharger on the 1,400 cm<sup>3</sup> "Cléon-fonte" engine powering most versions of the Renault 11. The Renault 11 Turbo headed the range and became the Renault brand's leading compact sports model, developing 105 hp DIN at 5,500 rpm, 157 Nm of torque at 2,500 rpm and accelerating from 0 to 100 km/h in a brisk 9 seconds. The Renault 11 Turbo has a top speed of 186 km/h and stands out with its emphatic body features, including side strips with "Turbo" lettering, fog lamps, and a spoiler sill integrated in the front bumper. In addition to a full range of comfort equipment, the model featured a 4-spoke sports steering wheel, a rev counter and the famous oil-pressure and turbo-pressure gauges characteristic of turbocharged Renaults.

Initially available as a three-door model, the Renault 11 Turbo was launched in a five-door version in France in 1985. Having achieved a distinguished rally career (with victories in Group N in the Tour de Corse and at Monte Carlo), the Renault 11 Turbo gained an extra 10 hp in 1987, taking the total to 115 hp.



## ET RENAULT 9 TURBO - 1985

After the Renault 11 in 1984, the Renault 9 range was also enhanced with a turbo version in 1985. The three-box version of the compact Renault model was thus available in a version combining a seriously sporty personality with even stronger natural elegance.

The road performance of the Renault 9 Turbo made it a leading model in the privileged club of mid-range sports sedans. It is a particularly strong performer with a 1,397 cm<sup>3</sup> engine fitted with a Garrett T2 turbocharger located ahead of the carburetor. The model develops 105 hp DIN and reaches a top speed of 184 km/h.



## RENAULT 5 GT TURBO – 1985

With the “Supercinq” replacing the Renault 5, the Renault 5 GT Turbo succeeded the Renault 5 Alpine Turbo in 1985. The model’s road behavior, highlighted in particular by its lively engine, won over dynamic customers looking for top-flight driving pleasure. It was the tenth model in the Supercinq range.

The engine on the Renault 5 GT Turbo is part of the type C “Cléon-fonte” family powering the Renault 5, 9 and 11 ranges. It is equipped with the same Garrett T2 turbocharger as the Renault 11 Turbo engine, but also boasts specific components, including oil rings, an oil pump, a specific oil feed system and cylinder head gasket, an intake manifold with water circulation, and a more diagonal camshaft for increased torque.

The turbocharger on the Renault 5 GT Turbo is efficient in terms of its reduced dimensions and mass, excellent thermal dissipation and low inertia, which serves to reduce response times. The specific turbo regulation system on this model, via capsule and valve, result in a slight growth in boost pressure in step with engine speed. This is beneficial to power, which totals 85 kW (115 hp DIN) at 5,750 rpm. The top speed of the Renault 5 GT Turbo is 200 km/h.

It became a track star as part of the “Renault 5 GT Cup” and also enjoyed a superlative rally career, winning two World Championship titles in Group N.



## RENAULT 21 2L. TURBO – 1987

In the second half of the 1980s, Renault pursued its policy of offering a high-performance version with a turbocharged engine for each product range. The Renault 21 2L. Turbo targeted the small but prestigious niche of emphatically sporty sedans such as the BMW 325i E30 and Mercedes 190 E 2.3 16. Competing against these models, the Renault 21 2L. Turbo boasted impressive performance, with a top speed of 227 km/h and a standard-fit ABS system. Intended for in-the-know motorists looking for sports cars offering real driving pleasure, it became the most sporty sedan in the Renault range and the flagship Renault 21.

The 1,995 cm<sup>3</sup> engine on the Renault 21 2L. Turbo, based on the 2-liter "Jet" petrol engine, develops power of 129 kW (175 hp DIN) at 5,200 rpm (162 hp for the catalyzed version) and torque of 270 Nm at 3,000 rpm. The light alloy engine features fully electronic management with a control unit simultaneously controlling the ignition, injection and boost pressure.

This was the first time it appeared in a supercharged version, with a water-cooled Garrett T3 turbocharger, also controlled electronically. This set-up has a number of advantages, achieving maximum possible torque at all engine speeds and respecting the correct temperature for engine operation. The circuit comprises two air-air intercoolers and a heat shield based on those used in Formula 1 racing.

In motorsport, Jean Ragnotti won the French supertourism championship at the wheel of a 430-hp version.



## RENAULT SAFRANE BITURBO – 1993

More than a sporty sedan, the Safrane Biturbo combines the comfort of a limousine with the road manners of a prestige coupé. At the time, it rivaled the most reputed European sedans on the market. The Renault Safrane Biturbo is powered by a 3-liter V6 PRV engine, similar to that of the Alpine A610 but specifically developed by Hartge (the engine) and Irmscher (the chassis), two renowned German specialists. It was boosted by two new K04 KKK turbochargers. The engine develops 193 kW (268 hp DIN) at 5,500 rpm.

The electronically controlled supercharging is particularly efficient thanks to two small turbos. As well as generating extra power, this solution accelerates the boost pressure increase and thus improves response times. Maximum torque of 365 Nm comes at 2,500 rpm. Torque is particularly accessible, with 97% of the total, or 354 Nm, available from 2,300 to 5,000 rpm. The Safrane Biturbo reaches a top speed of 250 km/h.

This version has class-leading attributes in terms of comfort, performance and safety. The Biturbo version enhances the intrinsic qualities of the model to provide a whole new driving experience. And in addition to the performance of the biturbo engine and its attendant top speed, this prestigious version also possesses outstanding road manners. The car's permanent four-wheel-drive transmission and electronically controlled suspension deliver maximum safety and consummate cornering precision. Rather than a sports model, the Safrane Biturbo is a powerful, safe and lavishly equipped high-end sedan.



## RENAULT MEGANE R.S. TROPHY – 2018

The 2018 Renault Mégane R.S. Trophy model based on Mégane IV boosts the Renault Sport range by perpetuating the famous Trophy line, which has existed since the first generation of Mégane R.S. It is the true standard bearer of the Renault Sport brand and the Mégane range in the broadest sense, bringing fans of dynamic driving even more performance and athleticism.

The model is equipped with a 4-cylinder 1,798 cm<sup>3</sup> turbo engine developing 300 hp, 420 Nm with the EDC gearbox and 400 Nm with the manual gearbox. This engine also powers Alpine A110 and Mégane R.S., but is optimized on R.S. Trophy thanks to a larger turbo mounted on ceramic ball bearings, which reduces response times. The engine can be mated to a 6-speed gearbox, either manual or a dual-clutch EDC automatic.

Renault Mégane R.S. Trophy is equipped with the “Cup” chassis comprising a Torsen® mechanical limited-slip differential that improves cornering approaches and traction when exiting corners and also provides firmer suspension. It is equipped with the 4CONTROL system with four steering wheels, the agility and stability of which make the model as pleasant to drive on road as on track. It is highly effective in corners, perfectly transferring power to the ground when accelerating sharply with the wheels turned. The chassis boasts progressive responses that enable drivers to approach the limits with peace of mind, snugly ensconced in the optional Recaro bucket seats. Combined with the 300 hp engine, it offers high-level performance on the track as well as at-the-wheel pleasure in everyday driving situations.



## Nouvelle Renault MÉGANE R.S. TROPHY R - 2019

Renault Sport presents the best-performing production car ever marketed by Renault. To prove it, Megane R.S. Trophy-R sets a 07'40"100 new record on the Nordschleife 20.6 km lap.

Equipped with the Megane R.S. Trophy 300 hp engine, it owes its increased speed to the weight reduction (up to 130 kg), the work on aerodynamics and the more radical development of its chassis for road holding.

To develop this vehicle, Renault Sport relied on a partnership with Akrapovič, Brembo, Bridgestone, Öhlins and Sabelt.

Megane R.S. Trophy-R will be launched on the market before the end of 2019, as an exclusive limited edition of a few hundred units only.

New version of a saga begun 15 years ago, Megane R.S. Trophy-R has set like its three iconic forerunners a new record on the Nordschleife (07'40"100) in front-wheel-drive production car category.



## \*About Renault Classic

The Renault collection comprises **over 750 vehicles** testifying to the inventiveness and know-how of **the company founded in 1898 in Boulogne-Billancourt**.

A **living collection**, it is conserved, maintained and operated by **Renault Classic**, which regularly showcases the models at exhibitions, shows and vintage races, on press and TV reports, and at sports events around the world.

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