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MOTORSPORT INFORMATION

Audi R8 LMS GT3 (2020)

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Audi R8 LMS for the 2020 season

Audi R8 LMS GT3 starts to its next season with tailwind

The evolution of the Audi R8 LMS in 2019 completed its first full year in worldwide racing and fulfilled all expectations. Audi Sport customer racing teams won the Dubai 24 Hours and the Gulf 12 Hours with the GT3 race car in 2019. In strategic commitments, Audi Sport together with its partners decided the Nürburgring 24 Hours for the fifth time and the Suzuka 10 Hours for the first time in its favor. Title successes in Australia, Germany, Central Europe and Thailand round out the tally of the young race car to date.

These successes, which Audi Sport customer racing scored against fiercest competition of up to twelve brands, validate the direction in which the development was headed. “We systematically developed the evolution so that customers would be able to make even better use of the race car,” says Chris Reinke, Head of Audi Sport customer racing. “Especially the current aero pack enables greater handling consistency in diverse fielding areas.” The successes claimed by amateur drivers in particular show that Audi Sport achieved its objectives.

The modifications are also paying off economically. The durability of the drive line has been enhanced and the maintenance intervals for the clutch and transmission have been extended. As a result, the Audi R8 LMS is a gain for its owners both in terms of racing and economy. Whether teams already own a second-generation Audi R8 LMS or purchase a new model: The modifications benefit everyone and can also be retrofitted to existing race cars. Since November 2018, Audi Sport has been delivering the new race car at a price of 398,000 euros (plus VAT).

With this race car Audi Sport and the customer teams are again contesting ambitious international programs in the 2020 season. The Intercontinental GT Challenge (IGTC) including the Spa 24 Hours plus the Nürburgring 24 Hours are again included in Audi Sport’s program this year. Customers around the globe represent the brand in national and regional championships and keep using internationally outstanding events in order to compete with the world’s best teams.

“High stability around the globe”

Chris Reinke, Head of Audi Sport customer racing, talks about the Audi R8 LMS and the goals for the 2020 season.

The new evolution of the Audi R8 LMS was an instant success in 2019. Looking back, how do you assess its debut season?

The competition in GT3 racing continues to be as high as ever. Twelve brands have homologated GT3 sports cars and a large number of these models meet with each other in most of the series. That our customers prevailed in stand-alone races as well as in major championships or were among the leading teams validates the direction of our development. We deliberately did not present an extremely extensive evolution in order to keep within reasonable economic bounds. In a sporting sense, we see ourselves validated as well, because the Balance of Performance levels the diverse technical concepts in the field and we are fully competitive. The direct feedback from our customers underlines the fact that our product meets their wishes and is very popular.

What potential does the GT3 category have worldwide in the 2020 season?

We're enjoying very high stability in many markets around the globe. Some of the world's most prestigious and major auto races are focused on the GT3 category and GT3 is firmly anchored on national and regional levels as well. In 2020, Audi Sport customer racing is again on the grid in all the key regions of the world at stand-alone events and permanently in championships. The Audi R8 LMS in the GT3 version remains the central pillar in our program.

What sporting goals have you set yourself for 2020?

Valuable competitions are again part of our strategic program. In the Intercontinental GT Challenge, which has existed since 2016, after a total of five title successes, we are, for the first time, no longer the hunted but, in the drivers' and manufacturers' classifications, the hunters. Obviously, it's our goal to be in contention when it comes to awarding the title. Following our fifth victory in the Nürburgring 24 Hours, we've remained the most successful manufacturer there since 2009 when we were on the grid with the R8 LMS for the first time. We'd like to continue this string of success. And on a worldwide scale, we're now supporting our customers in their programs with twelve Audi Sport drivers.

Second model cycle optimized for customers

Since 2015, the second generation of the Audi R8 LMS has been setting standards in terms of lightweight design, safety and aerodynamic efficiency. In many areas, the evolution that has been available since the end of 2018 presents itself even better than the previous model. The development of the second model cycle was primarily focused on a single objective: to modify the successful GT3 race car in ways that suit the needs of customer racing drivers even better than before.

For the development of the current race car, the engineers led by chief developer Armin Plietsch addressed four areas to achieve their objectives: aerodynamics, brake cooling, the clutch and the transmission. “We deliberately chose to make moderate modifications instead of pursuing a comprehensive evolution,” says Chris Reinke, Head of Audi Sport customer racing. “This is economically sensible for both new customers and for those teams that are able to easily retrofit their existing cars with all new components.”

At the front, modified body styling and a new splitter have not only represented a new face but also aerodynamic improvements since 2019. While the parameters for aerodynamic drag and downforce are specified by the FIA (Fédération Internationale de l'Automobile) the new shape makes more consistent downforce possible across diverse ambits. Varying ride heights that the teams achieve due to suspension setups, as well as driving conditions at different speeds or in situations like braking in front of corners and while accelerating, now have smaller effects on airflow. This leads to higher aerodynamic stability which makes for a steadier handling feel particularly for gentleman race drivers. Following the CFD calculations, Audi Sport tested the new components in the 50-percent wind tunnel and subsequently validated the results in tests. In addition to pros, amateur and gentlemen drivers were included in testing at an early stage. They confirmed that the direction of the development has resulted in appreciable progress.

In the area of brake cooling, the engineers targeted higher consistency as well. Improved airflow to the rear brake system and more efficient evacuation of hot air from the ventilated disc brakes prevents the wheels from overheating in racing operations. Due to the physical correlation between pressure, temperature and volume, these innovations are conducive to achieving more consistent tire pressures. This is another factor that enhances the consistency of the race car. In addition, optimized airflow through the front bumper improves brake cooling at the front axle.

In terms of power transmission components, Audi Sport improved the three-plate racing clutch. Wear protection for the clutch spring extends the rebuild interval of this highly stressed component by more than 50 percent. The other drive train elements have become more durable as well. Revised gear teeth and reinforced bearings make longer running times of the sequential six-speed transmission possible. In addition, the engineers managed to reduce the influence of wear-prone differential discs. By using a softer preloading spring wear can largely be compensated for, so that the locking effect will not diminish even on long runs. These advantages are particularly effective in 24-hour races because even after a continuous racing distance of several thousand kilometers, vehicle balance is maintained.

While these innovations made their world debut at the Paris Motor Show in October 2018, customers receive a concept that has perfectly proven its viability in all other areas. The chassis of the production model and the race car directly derived from it have been built in the same facility at Audi Sport GmbH at Böllinger Höfe since September 2015. The final assembly of the race car is performed at the customer racing site in Biberach.

In terms of safety, the current generation of the Audi R8 LMS plays a pioneering role, having clearly surpassed the requirements of the regulations ever since its launch. Thanks to a modified structure of the front end and a carbon fiber reinforced plastic (CFRP) crash element being used for the first time at the rear, the GT3 sports car fulfills the crash test requirements for Le Mans prototypes (LMP). The sophisticated Audi Sport Protection Seat PS03 with its structural stiffness and adaptability to various driver physiques is setting standards in seating technology. It is firmly connected to the chassis, which increases stiffness. A rail-mounted, easily adjustable foot lever unit and a height- and length-adjustable safety steering column enable various adjustments to the respective driver. By introducing the rescue hatch in the roof of the kind used in DTM race touring cars Audi was a pioneer in GT3 racing in 2015. Following a crash, the hatch makes it possible to pull off the driver's helmet upward in a way that is gentle on the spine and to apply a KED (Kendrick Extrication Device).

Lightweight design is another one of Audi's areas of expertise. In spite of the additional weight resulting from the aforementioned innovations, the race car's dry weight is clearly lower than before. The homologation weight that has been reduced compared with the first generation of the Audi R8 LMS can easily be achieved even in endurance racing trim with additional headlights and air conditioning for the helmet and seat. The intelligent material mix of aluminum in the Audi Space Frame (ASF) combined with the structural CFRP center tunnel and the CFRP back wall as well as the steel roll cage make the chassis alone about 30 kilograms lighter than that of the

first generation – since 2015, it has tipped the scales at merely 252 kilograms. At the same time, the torsional stiffness of the supporting frame has increased by 39 percent.

Although the race car features a more complex material mix, Audi has interlinked the manufacturing process of the production car and the race car even more closely than before. At a manufacturing facility at the Böllinger Höfe industrial park in Heilbronn, Audi Sport GmbH jointly produces both chassis variants. In spite of the race car receiving modified cast-aluminum nodes and a steel roll cage, the racing chassis of the R8 LMS remains integrated in the basic production process up to and including the point of roof assembly and cathodic dip painting (CDP), which is a type of priming. Only after these process steps, the race cars are completed at the Heilbronn-Biberach site.

Audi uses production parts in the R8 LMS wherever they make technical and economic sense in racing. The V10 engine with 5.2 liters of displacement and up to 430 kW (585 hp) of output in racing is produced on the same assembly line as the production unit. It remains nearly unchanged and, with a scheduled service interval of 10,000 kilometers and rebuild interval of 20,000 kilometers, sets standards in racing. The designers use modified or completely new assemblies only where they are required by motorsport regulations or by the significantly higher loads encountered in on-track competition. For instance, the production ASF chassis is only modified while the new bodywork consists of CFRP. Installed in the suspensions are wishbones that are strictly designed for racing. Fielding in the customers' hands has proven the durability of the overall construction. Teams that are active in customer endurance racing completed more than 75,000 kilometers in practice, qualifying and racing operations with individual chassis of the Audi R8 LMS in less than three years.

The high aerodynamic efficiency of the race car is illustrated by some comparative figures. Thanks to a fully lined underfloor and a conceptually integrated rear diffuser the engineers managed to reduce the size of the rear wing profile by 25 percent compared with the previous Audi R8 LMS ultra while the FIA-specified maximum downforce continues to be achieved. In many racing series, the engine output of the Audi R8 LMS is limited to slightly more than 367 kW (500 hp). Even so, the model achieves better lap times than its predecessor.

The Audi R8 LMS has proven its viability as an all-round race car for customer racing around the world. It meets the challenges posed on all race tracks in all climatic zones, has won titles in Saudi Arabia as well as in Central Europe, Asia, Australia or New Zealand. The model has been successful in sprint competitions around the globe as well as in 12-hour races in Malaysia, Australia, and in the Gulf 12 Hours or in the 24-hour classics at the Nürburgring, at Spa, in the GTD class at Daytona, and in Dubai.

The long service intervals enable economical operation and thanks to its racing qualities and high safety the Audi R8 LMS is equally popular with pros and amateurs.

Technical data

Audi R8 LMS

As of February 2020

Model	Audi R8 LMS (2020)
Vehicle	
Vehicle type	Sports car according to FIA GT3 regulations
Chassis	Audi Space Frame (ASF) featuring an aluminum CFRP hybrid design with stressed steel roll cage
Bodywork	CFRP and aluminum
Safety concept	Energy-absorbing aluminum and CFRP crash structures front and rear. Safety concept meets FIA LMP1 crash requirements. Rescue hatch in roof
Engine	
Type	90° V10 gasoline engine, longitudinally mounted in front of the rear axle, four valves per cylinder, four double overhead camshafts, gasoline direct injection
Emission control system	One upstream oxygen sensor, one metallic racing catalytic converter per bank
Engine management	Bosch Motorsport Motronic MS6.4
Engine lubrication	Dry sump (adopted from production model)
Cubic capacity	5,200 cc (bore x stroke 84.5 mm x 92.9 mm)
Power output	Variable by means of restrictors up to 430 kW (585 hp) *
Torque	Over 550 Nm
Drivetrain/transmission	
Type of drive	Rear-wheel drive, ASR traction control (twelve-stage)
Clutch	Electrohydraulically operated sintered three-plate racing clutch (ECA)
Transmission	Sequential, pneumatically operated 6-speed performance transmission with paddle shifters
Differential	Mechanical limited slip differential, variable preload
Drive shafts	Constant-velocity joint shafts
Suspension/steering/brakes	
Steering	Servo-assisted rack and pinion steering
Suspension	Double wishbones front and rear, suspension struts with coil springs and two-way gas pressure dampers. Ride height, toe and camber infinitely variable, three-way adjustable stabilizers front and rear
Brakes	Hydraulic dual-circuit braking system, variable brake pressure distribution (front axle/rear axle), steel brake discs front (380 x 34 mm) and rear (355 x 32 mm), racing ABS (twelve-stage)
Wheels	Forged aluminum wheels, Front 12.5" x 18" offset 45.65, rear 13" x 18" offset 43
Tires	Front 30-68/18, rear 31-71/18
Weight/dimensions	
Length/width/height	4.573 mm/1.997 mm/1,171 mm
Wheelbase	2,700 mm
Dry weight acc. to homologation	1,235 kg
Fuel cell capacity	120 l (FT3 safety fuel cell)
Equipment	
Fire extinguishing system	According to FIA Standard 8865-2015
Controls	Height- and length-adjustable safety steering column, multi-functional steering wheel, quick-adjustable pedals mounted on rails
Seat system	Audi Sport Protection Seat PS03 acc. to FIA 8862-2009 with six-point mounting
Refueling system	Krontec RFC-88-TN, optionally Capless system
Air conditioning	Prepared for installation of additional cooling systems
Electrical system	Motorsport electrical system
Price	EUR 398,000 (plus VAT)

* established by BoP of the series organizers

Race car and production model

Close relatives

Direct synergies between racing and production: The Audi R8 LMS is based on the new Audi R8 (Audi R8: combined fuel consumption in l/100 km: 13.3-12.9; CO₂ emissions in g/km: 301-293. Fuel consumption, CO₂ emissions and efficiency classes given in ranges depend on the tires/wheels used). It is even more powerful than its predecessor. About 50 percent carry-over parts characterize the versions for the road and the race track.

Audi Sport carries the genes from motorsport to the road, and no other model embodies this idea as consistently as the Audi R8. Its development was characterized by close cooperation between race engineers, people in motorsport and engineers from the Technical Development Department. The production model and race car share a common basis.

For example, the chassis: The close connection between the production and the race car starts with the design stage and ends with manufacturing. The Audi R8 is made at a production site that has specifically been established for the sports car – the Böllinger Höfe industrial park in Heilbronn. In addition to the production model, the chassis of the race car is produced at the factory. The sports car is subsequently completed with racing-specific components. Both versions come from the same facility. For the assembly of the individual motorsport components, the racing chassis is removed from the production line and subsequently reintroduced.

For example, the lightweight design: Characteristic for the Audi Space Frame (ASF) is the multi-material lightweight design. Carbon fiber reinforced plastic (CFRP) components form the B-pillars, the center tunnel and the rear wall. The front end, the roof arch and the rear end are assembled as a framework of cast aluminum nodes and profiles, some of which consist of new alloys. As in any ASF, every component has been precisely designed for its place and purpose. For example, the developers have integrated a number of components in the body shell according to their respective functions. The body shell is now 15 percent lighter than that of the first-generation Audi R8. Particularly in terms of stiffness, the body of the new Audi R8 sets standards. The resulting quality of the lightweight design is the benchmark among competitors. The race car is precisely based on this ASF body as well. Complemented by a steel roll cage, the chassis in the race car is 30 kilograms lighter than the one of the first generation, but has 39 percent more torsional stiffness.

For example, the engine: The ten-cylinder engine is assembled by hand at the engine plant in Győr, Hungary. The engines for both the road-going and the racing version are almost completely identical. The standard dry-sump lubrication of the 5.2 FSI engine is a classic motorsport technology. It allows for low installation of the unit which benefits the center of gravity. The pump module operates with several scavenging stages and ensures lubrication under all conditions – even with lateral accelerations in the range of 1.5 g that the production R8 may reach. As a result, the engine offers reserves that are completely sufficient for racing purposes as well. The robust V10 in racing has been designed for a service interval of 10,000 kilometers and 20,000 kilometers for the first rebuild. Many teams use the engine for further cycles. These unusually high figures in racing are a crucial advantage for the owners in analyzing the cost effectiveness of the race car.

International fielding and support

Customer support around the globe

Founded in 2009, Audi Sport customer racing produced more than 250 GT3 race cars of the Audi R8 LMS within the first decade. The race cars from now two model generations have found buyers all over the world and customers can rely on receiving global support.

The customer racing program has had an international scope from the very beginning. Right in its debut season, in 2009, the first generation of the Audi R8 LMS, in addition to a title in Germany, won a European championship trophy and a championship in Belgium. Besides other European countries, Australia, Asia and America soon became markets as well.

To satisfy all owners, Audi Sport has established a system of comprehensive support. Since the 2015 season, Audi Sport customer racing has had its headquarters in Neuburg an der Donau and been responsible for all European teams. On the other continents, service partners support the program. In the United States of America, it is Audi Sport customer racing USA and in Asia, Audi Sport customer racing Asia and Audi Sport customer racing Japan. In the Pacific region, Audi Sport customer racing Australia is responsible. Since 2018, teams in Canada have had a dedicated point of contact: Audi Sport customer racing Canada has closely linked the racing program of its customers with retail.

In addition to this permanent support, customer racing consultants from Germany are deployed. They are on site at selected, strategically important events and provide advice to the teams relating to maintenance, setup work and repairs. At major racing series or important single events, Audi Sport customer racing service trailers are the hubs in the paddocks. Overseas, special freight containers serve as logistics centers. “Our customers keep confirming to us how much they’re impressed not only with our products but also our support,” says Chris Reinke, Head of Audi Sport customer racing. “For many teams, this is a key selling point and that’s why we’ve constantly enhanced our services over the course of the years.”

Top-caliber racing around the world

GT3 race cars are at home in many countries of the world. They are in equal demand in sprint and endurance racing across diverse distances, plus in stand-alone events, regional or even intercontinental races. Club racers take the wheel of the Audi R8 LMS GT3 just like young up-and-coming race drivers and established pros.

Asia

Asian Le Mans Series	www.asianlemansseries.com
GT World Challenge Asia	www.gt-world-challenge-asia.com
China Endurance Championship	www.facebook.com/CEC-China-Endurance-Championship-579241832461381
China GT Championship	www.chinagt.net.cn/en
Circuit Hero	www.zic.com.cn/en/race/pan-pearl-river-delta-super-racing-festival
NGK UAE Procar Championship	www.dubai autodrome.ae/motorsport/uae-procar
Super GT	www.supergt.net
Super Taikyu	www.supertaikyu.com
Thailand Super Series	www.thailandsuperseries.net

Europe

ADAC GT Masters	www.adac-gt-masters.de
GT World Challenge Europe	www.gt-world-challenge-europe.com
GT Sports Club	www.gtsportsclub.com
British GT Championship	www.britishgt.com
Campionato Italiano GT	www.acisport.it/en/CIGT/home
GTC Race	www.gtc-race.de
Eset V4 Cup	www.eset-v4.com
FIA Central European Zone	www.cez-motorsport.com
GT und Tourenwagen Racing Series	www.gtrseries.com
International GT Open	www.gtopen.net
Michelin Le Mans Cup	www.lemanscup.com/en
Spezial Tourenwagen Trophy	www.spezial-tourenwagen-trophy.de
Nürburgring Endurance Series	www.vln.de

International

24H Series www.24hseries.com
FIA Motorsport Games www.fiamotorsportgames.com
Intercontinental GT Challenge www.intercontinentalgtchallenge.com

Endurance races

Gulf 12h www.gulf12hours.com
Nürburgring 24h www.24h-rennen.de
Spa 24h www.total24hours.com
Thunderhill 25h www.nasa25hour.com

North America

IMSA WeatherTech SportsCar Championship www.imsa.com
GT World Challenge America www.gt-world-challenge-america.com

Oceania

Australian Endurance Championship www.australiangt.com.au
Australian GT Championship www.australiangt.com.au
Australian GT Trophy Series www.australiangt.com.au
GT-1 Australia www.gt1australia.com.au
New Zealand Endurance Championship [www.motorsport.org.nz/
championships-series/
endurance-championship](http://www.motorsport.org.nz/championships-series/endurance-championship)
North Island Endurance Series www.nierdc.com
NSW CAMS Championship www.prodsports.com.au
South Island Endurance Series www.facebook.com/sierdcnz
Victorian State Circuit Racing Championships www.vicstateraceseries.com

South America

Endurance Brasil www.endurancebrasil.com

Partners

The partners of Audi Sport customer racing

Audi Sport customer racing cooperates with three partners in its GT3 racing program.

Eibach

Eibach enjoys a reputation worldwide as a leading manufacturer of high-quality suspension and chassis systems as well as technical specialty springs for demanding uses. The range of applications covers almost all high-quality areas of industrial and automotive engineering. For decades, Eibach has also been an important partner in the world of high-performance motorsport.

Hör Technologie GmbH

The precision parts manufacturer Hör Technologie has been involved in motorsport, aerospace and motorcycle industry, and the automotive sector for decades. The know-how covers development, design, manufacture, heat treatment and quality control. From the prototype to production, Hör Technologie offers tailor-made customer solutions in transmission technology and camshaft technology.

OZ Group

OZ is an Italian company with a worldwide sales organization and a multi-brand marketing strategy. Its headquarters and production site are in San Martino di Lupari near Padua in Italy. OZ sells light alloy wheels via a worldwide network of branches and authorized sales partners. OZ stands for Italian top quality in the world of wheels and is an important supplier to various sectors such as motorsport, aftermarket, motorcycle and OEM with tailored projects for luxury car manufacturers.

Program on four pillars

Audi's customer racing program began in 2009. Initially, Audi Sport customer racing with the R8 LMS focused on the GT3 category that was seeing worldwide growth. At the end of 2016, the teams were able to purchase the Audi RS 3 LMS for the TCR touring car class for the first time. Since the end of 2017, the Audi R8 LMS GT4 has been an additional pillar of the customer racing program. In 2018, the brand introduced the current evolution of the GT3 model. In 2019, Audi Sport presented the R8 LMS GT2. With that, the current program rests on four pillars.

The portfolio of Audi Sport customer racing is diverse, and the product range modern and closely oriented to the needs of the teams. The Audi RS 3 LMS delivering up to 257 kW (350 hp) nationally and internationally offers professional opportunities to enter touring car racing at moderate costs. In 2020, it is entering its fourth season. The Audi R8 LMS GT4 targets amateur drivers who would like to contest sprint or endurance races with an attractive, production-based sports car. For the 2020 season, Audi Sport presented an updated version of the sports car delivering up to 364 kW (495 hp). The GT3 version of the Audi R8 LMS has been on the grid as an evolution since the 2019 season. The race car with power output of up to 430 kW (585 hp) impresses with a balanced overall package and drivability that has been enhanced once again. The Audi R8 LMS GT2 with 470 kW (640 hp) that was presented in 2019 as well rounds out the range of power-plants at the top end. It specifically addresses gentleman drivers and sports car enthusiasts who are able to experience a new form of fascination also at track day events in it.

Audi is one of the most attractive manufacturers in international customer racing. In its first decade, across all model ranges, Audi Sport customer racing built a total of 563 race cars. Since 2015, Audi Sport customer racing has presented at least one new or updated model each year. The program that is both a racing and business success has become firmly established around the globe. In addition to the products, support is another key selling point for many teams: five contractual partners – two in Asia, one in Australia, one in the United States and one in Canada – cover the regional supply and support to the teams while Audi Sport customer racing based in Neuburg an der Donau takes care of the European markets.

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