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#### MOTORSPORT INFORMATION

## Audi R8 LMS GT3 (2019)

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#### Audi R8 LMS for the 2019 season

#### Audi R8 LMS - a winner attacks

The current version of the Audi R8 LMS is the fourth model innovation in just four years from Audi Sport customer racing: Following the radically new second generation of the Audi R8 LMS (2015), the Audi RS 3 LMS TCR touring car (2016) and the Audi R8 LMS GT4 sports car (2017), the updated Audi R8 LMS GT3 was unveiled at the Paris Motor Show in October 2018. The new evolution of the model that is successful in worldwide sprint and endurance racing is closely tailored to customers' needs in terms of technology and price. The career of the new Audi R8 LMS began with a one-two result in the 2019 running of the Dubai 24 Hours.

With that, the new evolution seamlessly continued the winning streak of its predecessor that, among other events, decided the endurance races at Bathurst, Daytona, Dubai, Laguna Seca, on the Nürburgring, at Sepang and Spa in its favor, as well as having won many worldwide championship titles. So what could still be improved? "We've put an even stronger focus on our large base of customers and their interests," says Chris Reinke, Head of Audi Sport customer racing. "The predesign stage of the second evolution of our current model generation was centered on many discussions with our teams." In addition to the pros who are successful with the race cars, amateur drivers have been clinching victories and even class or overall titles in America, Asia, Australia, and New Zealand, and in Europe as well.

In the development project, Audi Sport focused on providing these customers with even better support than before. Optimizations in the areas of aerodynamics and cooling make for even greater consistency of handling performance in diverse fielding applications. Durability of the power transmission elements was another focal area. For the teams, the evolution package pays off both in terms of racing and economy: Moderate modifications of the overall concept and the longer maintenance intervals for the clutch and transmission stand for sensible investments that promise success in racing and optimally support amateurs. Whether the teams already own a second-generation Audi R8 LMS or buy a new model: the changes benefit everyone and are suitable for retrofitting existing race cars as well.

Since November 2018, Audi Sport has been delivering the new customer race car at a selling price of 398,000 euros (plus VAT). The evolution kit for retrofitting older vehicle generations costs 28,000 euros (plus VAT).

#### Interview with Chris Reinke

#### "Customer interest takes center stage"

Chris Reinke, Head of Audi Sport customer racing, explains the background of the Audi R8 LMS evolution in an interview.

## Why is Audi Sport customer racing offering a new evolution of the Audi R8 LMS in the GT3 version?

Together with our customers we've been showing a strong track record since 2015, but even a good concept can be improved some more. Rather than the professional drivers our customers clearly took center stage in this context.

#### In what respects is the second evolution better than the first version?

The car can be driven more consistently in many respects, which is particularly beneficial for amateur drivers. We received this feedback during tests and it has been confirmed in the first races. We've designed the car's aerodynamics so that handling performance remains very clear in a wider range. Our modifications that are conducive to achieving more consistent tire temperatures contribute their share to this as well. Plus, durability of the power transmission systems is now even better than before. This increases reliability, extends maintenance intervals and, as a result, saves the customer costs.

## Audi Sport's modifications are moderate compared with those of some other manufacturers who opt for more extensive evolution packages. Why?

For us, there was a technical and an economic reason. We focused on those areas that make a difference for the customer. Faster lap times were not the objective. The balance of performance rules level differences between the various race cars from more than a dozen manufacturers through specific interventions anyway. And, financially, our approach does not require high expenditures to be made either by new or existing customers who have to upgrade their cars for FIA-regulated series. This goes down really well.

#### What prospects do you see for the GT3 category?

There used to be a phase of apparent market saturation at a high level. However, we're clearly seeing continuing interest. The number of series admitting these models is still growing – for instance in Asia. Also, new manufacturers keep entering the market while established ones present new evolutions. GT3 racing for the mid-term will arguably remain the most important pillar in the worldwide customer racing business.

#### Audi R8 LMS

#### 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. For the 2019 season, Audi Sport customers are able to acquire the evolution as a version that has been enhanced yet again. 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.

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 not only represent a new face but also aerodynamic improvements. 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 Protection Seat PS 3 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 diffusor 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 and in 12-hour races in Malaysia or Australia, 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: April 2019

Model	Audi R8 LMS (2019)
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, CFRP and aluminum bolt-on parts
Safety concept	Energy-absorbing aluminum and CFRP crash structures front and
	rear. Safety concept meets FIA LMP1 crash requirements.
	In-roof rescue hatch
Engine	
Engine type	V10 engine, 90-degree cylinder angle, four valves per cylinder,
5 ,.	DOHC, gasoline direct injection, emission control by two exhaust
	gas catalytic converters for racing
Engine management	Bosch Motorsport Motronic MS6.4
Engine lubrication	Dry sump (adopted from production model)
Cubic capacity	5,200 cc
Performance	Variable by means of restrictors up to 430 kW (585 hp)*
Torque	More than 550 Nm
Drivetrain/transmission	
Type of drive	Rear-wheel drive, traction control (ASR)
Clutch	Electro-hydraulically operated three-plate racing clutch (ECA)
Transmission	Sequential, pneumatically operated six-speed performance
	transmission with paddle shifters
Differential	Limited slip differential, variable preload
Drive shafts	Constant-velocity joint shafts
Suspension/steering/brakes	
Steering	Servo-assisted rack and pinion steering
Suspension	Front and rear independent suspension, double wishbones,
	suspension struts with coil springs and adjustable dampers, and
	adjustable stabilizers front and rear
Brakes	Hydraulic dual-circuit braking system, steel brake discs front (380 >
\A/I <sub>2</sub> = 2   2	34 mm) and rear (355 x 32 mm), racing ABS
Wheels	Aluminum forged wheels, front 12.5 x 18 inches, rear 13 x 18 inches
Tires	Front 30-68/18, rear 31-71/18
Weight/dimensions	4.572 (1.007 (1.171
Length/width/height	4,573 mm/1,997 mm/1,171 mm
Empty weight	1,235 kg**
Fuel cell capacity	120 l
Equipment	
Fire extinguishing system	Audi Sport
Controls	Height- and length-adjustable safety steering column,
Calling	quick-adjustable rail-supported foot lever unit
Seating system	Audi Protection Seat PS 3

<sup>\*</sup> established by BoP of the series organizers \*\* homologation weight to be determined at a later date

#### Race car and production model

#### Close relatives

Direct synergies between racing and production: The Audi R8 LMS is based on the new Audi R8 Coupé (Audi R8 Coupé: combined fuel consumption in l/100 km: 12.9;  $CO_2$  emissions in g/km: 296. Fuel consumption and  $CO_2$  emissions figures 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. At the same time, the torsional stiffness of the production model is 40 percent higher. 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.

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 fieldings and support

#### At home on five continents

In the first decade of its existence, Audi Sport customer racing produced more than 250 Audi R8 LMS GT3 race cars across two model generations. They are fielded worldwide. The customers placing their trust in the sports cars from Germany can rely on 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.

All owners can rely on comprehensive support. Since the 2015 season, Audi Sport customer racing has had its headquarters at Audi Neuburg's Competence Center Motorsport 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 the Audi Sport brand and 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 continuously increased our services over the course of the years."

#### 2019 fielding opportunities

#### At home all over the world

A wealth of competitions for GT3 race cars exists around the globe. Be it sprint or endurance races, stand-alone events or intercontinentally connected series such as the Blancpain GT World Challenge: every customer finds their suitable environment, from club to top-caliber racing.

#### Asia

Asian Le Mans Series Audi Sport R8 LMS Cup

Blancpain GT World Challenge Asia China Endurance Championship

China GT Championship

GT Asia

GT Masters Asia

Super GT Super Taikyu

**Thailand Super Series** 

www.asianlemansseries.com

www.audi-motorsport-asia.com www.blancpain-gt-series-asia.com www.facebook.com/CEC-China-

Endurance-Championship-

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www.chinagt.net.cn/en www.gtasiaseries.com

www.facebook.com/GTMasAsia

www.supergt.net www.supertaikyu.com

www.thailandsuperseries.net

#### Europe

ADAC GT Masters
Blancpain GT Series
Blancpain GT Sports Club
British GT Championship
Campionato Italiano GT

DMV Gran Turismo Touring Car Cup

Eset V4 Cup

FIA Central European Zone International GT Open

Michelin Le Mans Cup

Spezial Tourenwagen Trophy

Swedish GT

**VLN Endurance Championship** 

www.adac-gt-masters.de www.blancpain-gt-series.com www.blancpainsportsclub.com

www.britishgt.com

www.acisport.it/en/CIGT/home

www.dmv-gtc.de www.eset-v4.com

www.cez-motorsport.com

www.gtopen.net

www.lemanscup.com/en

www.spezial-tourenwagen-trophy.de www.facebook.com/swedishqt

www.vln.de

#### International

24H Series www.24hseries.com

FIA GT Nations Cup www.fia.com/events/gt-nations-

cup/season-2018/fia-gt-nations-cup

FIA GT World Cup www.fia.com/events/gt-world-

cup/season-2019/2019-fia-gt-world-

cup

Intercontinental GT Challenge www.intercontinentalgtchallenge.com

**Endurance races** 

24h Nürburgring www.24h-rennen.de 25h Thunderhill www.nasa25hour.com

**North America** 

IMSA WeatherTech SportsCar Championship www.imsa.com

Blancpain GT World Challenge America www.world-challenge.com

**Pacific** 

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

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 five partners in its GT3 racing program.

#### Castrol

Castrol is the world's leading manufacturer, distributor and trader of high-quality lubricating oils, greases and related services. Its worldwide customers come from the fields of automotive engineering, industry, maritime and aerospace transport, and oil extraction and production. The company is headquartered in the United Kingdom and is also directly represented in more than 46 countries. Castrol has some 7,500 employees worldwide.

#### 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.

#### Montaplast

Albert Stulz sr. founded Montaplast in 1958. The medium-sized company has decades of experience in manufacturing plastic precision parts and systems – initially for household appliances and subsequently for the automotive industry. In 1992, Montaplast of North America followed and since then, sales branches and development offices in Detroit, Suzhou, Nagoya, London, Paris, Stuttgart, Munich and Cologne have been established by Montaplast.

#### **OZ Group**

OZ is an Italian company with global distribution and a multibrand marketing strategy. Its main headquarters and production facility are in Italy (San Martino di Lupari, Padua), and it sells light alloy wheels through a global network of branches and qualified sales partners. OZ symbolizes Italian excellence in the world of wheels and is a major supplier to multiple sectors, including motor racing, after market, motorbike, and OEM with custom projects for luxury auto makers.

#### Audi Sport customer racing

#### Program on four pillars

Audi's customer racing program began in 2009. Initially, Audi Sport customer racing with the R8 LMS focused on the globally growing GT3 category. 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 2019, Audi Sport presents the R8 LMS GT2. Hence 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. 2019 marks its third 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. In 2018, its debut year, teams won ten worldwide titles with the sports car that delivers up to 364 kW (495 hp). The GT3 model of the Audi R8 LMS presents itself as a new version in 2019. The race car delivering up to 430 kW (585 hp) is available as an evolution. The teams benefit from even better drivability. The Audi R8 LMS GT2, presented in 2019 as well, with power output of 470 kW (640 hp) complements the lineup upward. It specifically addresses gentleman drivers and sports car enthusiasts who thus also experience a new form of fascination on Track Days.

Audi is one of the most attractive manufacturers in international customer racing. Between 2009 and 2018, Audi Sport customer racing built a total of 563 race cars across all model ranges. 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 around the world while Audi Sport customer racing based in Neuburg an der Donau takes care of the European markets.

#### Contact details

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