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Dossier de presse

La nouvelle Audi R8

Résumé

Aucun modèle Audi n'est aussi proche de la compétition, aucun n'est aussi dynamique : la super sportive Audi R8 est désignée pour un maximum de dynamisme dans tous ses aspects techniques – Depuis son Audi Space Frame (ASF) jusqu'à son aérodynamisme, en passant par sa transmission intégrale permanente quattro, nouvellement développée.

Le moteur central V10 atmosphérique garantit des performances impressionnantes, particulièrement pour la version la plus puissante de 610 ch : elle réalise le 0 à 100km/h en seulement 3,2 secondes et offre une vitesse maximale de 330 km/h.

Un moteur central puissant fonctionnant à plein régime, la transmission intégrale permanente quattro avec distribution du couple, une conception ultralégère avec l'Audi Space Frame (ASF) en carbone et aluminium et un châssis dynamique font de l'Audi R8 le fer de lance sportif de la gamme Audi, désormais encore plus affûté.

L'étroite collaboration entre les ingénieurs de voitures de course, les experts en sport automobile et les développeurs a mené à une amélioration significative des performances – que ce soit dans la version sportive de route tout comme dans la voiture de course Audi R8 LMS qui a été conçue simultanément.



« La nouvelle Audi R8 V10 plus est la voiture de production Audi la plus performante et la plus rapide jamais conçue » déclare Prof. Dr. Ulrich Hackenberg, membre du directoire de AUDI AG en charge du développement technique. « Le sport automobile a toujours été un composant solide du caractère de Audi. Avec la nouvelle Audi R8, nos ingénieurs transmettent toute leur expertise de la course automobile du circuit à la route. Cela nous permet aussi de renforcer les valeurs qui sont l'essence même de la marque : dynamisme, design et qualité. »

Moteur : le V10 en deux versions

Le moteur de la nouvelle super sportive est disponible en 2 versions – avec 540 ch pour l'Audi R8 V10 et 610 ch pour l'Audi R8 V10 plus. Le couple moteur – 540 Nm et 560 Nm, respectivement – est disponible à 6500 trs/min pour les deux versions. Par rapport au modèle précédent, la puissance a considérablement augmenté et la réactivité du moteur 5,2 l, naturellement aspiré et fonctionnant à plein régime (à plus de 8 700 trs/min) est encore plus spontanée. Tout comme celui de l'Audi R8 de course, le moteur V10 a un système de lubrification à carter sec. Sa sonorité caractéristique est encore plus intense et un système d'échappement sport est disponible en option. L'efficacité est meilleure que sur les modèles précédents – en progression de 13 % (33 g/km d'émissions de CO₂). Le nouveau moteur V10 est équipé de technologies efficaces. Les concepteurs ont inclus le système COD (cylinder on demand), qui coupe l'un des deux bancs de cylindres lorsque la voiture est à bas régime. La nouvelle R8 bénéficie également d'un système d'injection double, qui injecte le carburant dans les chambres de combustion et le collecteur d'induction seulement en cas de demande. Quand le conducteur lève le pied de l'accélérateur et que le véhicule est à plus de 55km/h, la nouvelle Audi R8 active son mode roue libre. Quand la voiture s'arrête, le système start-stop désactive le moteur V10.

Dans la catégorie des voitures de sport, la nouvelle Audi R8 est parmi les leaders en termes de performances de conduite. Le modèle V10 réalise le 0 à 100 km en seulement 3,5 secondes et sa vitesse maximale est de 320 km/h. L'Audi R8 V10 plus, le modèle Audi le plus rapide, réalise le 0 à 100 km en 3,2 secondes et le 0 à 200 km/h en 9,9 secondes. De plus, toujours pour le même modèle, chaque cheval déplace seulement 2,38 kg du poids du véhicule à sec - un excellent ratio puissance/poids.

Stabilité et dynamisme : la nouvelle transmission intégrale permanente quattro

Positionnée derrière le V10, la transmission S tronic à sept rapports effectue des changements de rapports ultra-rapides par contrôle électronique. La transmission à double embrayage dirige les forces vers le nouveau système quattro avec un embrayage multidisques activé électro-hydrauliquement sur l'essieu avant. Il dispose d'un refroidisseur actif à eau pour un maximum de performances. L'embrayage

distribue le couple de façon variable selon le mode de conduite – jusqu’à 100 % du couple peut être dirigé vers les roues avant ou arrière.

La gestion de l’embrayage est intégrée dans le système Audi drive select et permet au conducteur de choisir entre différents mode de conduite tels que confort, auto, dynamique ou individuel. Pour l’Audi R8 V10 plus (en option pour la V10), le mode « performance » est fourni avec 3 modes additionnels : temps sec, pluie et neige. Ils adaptent des paramètres clés de conduite selon l’adhérence à la route. Un verrouillage mécanique du différentiel arrière est en série. Ses valeurs de verrouillage ont été nouvellement réglées afin de collaborer avec la transmission quattro qui est contrôlée activement.

L’ADN motorsport : Châssis à double triangle de suspension avant

L’ADN motorsport de la nouvelle Audi R8 s’exprime aussi au niveau du châssis avec ses triangles de suspension avant en aluminium.

Sur l’Audi R8 V10 plus, le réglage est très sportif et les amortisseurs contrôlés électroniquement (Audi magnetic ride) sont disponibles sur les deux modèles en option.

Le nouveau système de direction assistée électromécanique offre au conducteur une appréciation de la route finement différenciée. Audi peut aussi installer la direction dynamique, capable d’adapter son braquage à la vitesse du véhicule.

Dans les deux versions du moteur, la nouvelle Audi R8 est équipée de jantes de 19 pouces. Des roues de 20 pouces avec des pneus en 245/30 à l’avant et 305/30 à l’arrière sont disponibles en option.

Les freins puissants ralentissent la voiture efficacement et pour la version V10 plus, les disques sont en céramique renforcée de fibre de carbone (en option sur l’Audi R8 V10).

En plus de l’intégration du système quattro, l’Audi drive select intègre aussi d’autres systèmes dans ses quatre modes de base : la pédale d’accélération, la direction, la boîte de vitesse S tronic, le contrôle des amortisseurs (optionnel), la direction dynamique (optionnelle) et les clapets du système d’échappement. Pour les modes de performance temps sec, pluie et neige, l’ESC est également contrôlé.

Structure allégée : 1 454 kg seulement à sec

Sur la balance, la version haut de gamme Audi R8 V10 plus affiche un poids à vide (sans conducteur) de 1 555 kg et à sec de 1 454 kg. La carrosserie multi matériaux Audi Space Frame (ASF) allège le poids puisqu’elle ne pèse que 200 kg grâce à un nouveau type de construction multi matériaux. Elle est composée de 79 % d’aluminium et de 13



% de plastique renforcé de fibre de carbone (PRFC) et a été designée selon la devise de Audi « Le bon matériau en bonne quantité au bon endroit ».

Les éléments en aluminium créent un cadre qui intègre d'importants composants en PRFC – le tunnel central, la paroi arrière et les piliers B. Sur l'Audi R8 V10 plus, des éléments ajoutés tels que les lames latérales et le diffuseur en PRFC, complètent l'enveloppe extérieure légère. Par rapport au modèle précédent, l'ASF multi matériaux voit sa rigidité en torsion augmenter de 40 %. La carrosserie offre un bon confort acoustique et un haut niveau de sécurité.

Comme dans une voiture de course, le concept aérodynamique de la nouvelle Audi R8 a été designé premièrement pour la stabilité de conduite. Son élément central est un diffuseur long et large sur le soubassement. Sur l'Audi R8 V10 plus, un total de 140 kg de force d'appui est générée à vitesse maximale : 40 kg à l'essieu avant et 100 kg à l'essieu arrière.

Une silhouette basse, large et musclée

Avec 4,42 mètres de long, 1,24 mètre de haut et 2,65 mètres d'empattement, ses mensurations n'ont guère changé par rapport à sa devancière, la largeur de 1,94 mètre augmentant d'environ quatre centimètres. Désormais, les proportions relèvent davantage d'une voiture de course et les thématiques stylistiques de l'Audi R8 antérieure sont plus affirmées.

La nouvelle Audi R8 est longue de 4,42 m et large de 1,94 m. Ses proportions – avec son cockpit très déporté sur l'avant, une ligne de pavillon longue et fuyante et un empattement court – rendent le concept technologique de la super sportive reconnaissable au premier coup d'œil. Les thématiques stylistiques de l'Audi R8 antérieure sont plus affirmées.

Les « side blades », par exemple, sont désormais interrompues par une ligne continue qui donne un profil plus sportif, plus tendu.

Les éléments verticaux des feux de jour identitaires rappellent les lamelles verticales des prises d'air et accentuent l'impression de largeur de la voiture. Au centre du capot avant, les quatre anneaux surplombent une calandre Singleframe large et plane en nid d'abeille. L'Audi R8 est équipée d'origine de projecteurs LED et peut recevoir en option le faisceau laser qui double la portée des feux de route à 600 mètres, ainsi que des clignotants avant dynamiques. Les feux arrière LED sont en série. La sportivité à l'arrière est renforcée par le diffuseur, la grille de ventilation du capot moteur et – sur l'Audi R8 V10 plus – un aileron fixe en PRFC.



Les 11 coloris de carrosserie proposés peuvent être associés à des « side blades » proposée en 6 couleurs. Les « side blades » en carbone noir laqué sont en série sur l'Audi R8 V10 plus (en option sur l'Audi R8 V10). Le programme Audi exclusive permet à chaque client d'avoir le choix parmi tous les coloris de carrosserie et de lame latérale.

Intérieur : design esthétique ultraléger

À l'intérieur, les lignes géométriques tendues mettent en valeur la légèreté et l'esthétique de la structure, typiques de la marque. L'élément caractéristique est ici le Monoposto, un arc enveloppant le poste de conduite. À la place de l'écran MMI du modèle précédent se trouvent maintenant les trois boutons de commande centralisée de la climatisation. La planche de bord semble presque aérienne. Derrière les sièges, l'espace offre une capacité de 226 l qui complète celle du compartiment bagage à l'avant de 112 l.

Les sièges bas avec appui-tête intégré sont complètement nouveaux. Sur le modèle plus, les sièges baquets légers sont en série (en option sur la V10). Côté sellerie, deux choix sont proposés : Alcantara/cuir Nappa perle et tout cuir Nappa. Sont également disponibles différents éléments d'habillage en fibre de carbone revêtue d'un vernis incolore, deux packs cuir, un nouveau motif de surpiqûres en losanges et des ornements en PRFC. Le programme Audi exclusive permet également de répondre à tout autre souhait de personnalisation.

Comme dans une voiture de course: l'intérieur et les commandes

Au volant de la nouvelle Audi R8, le conducteur se sent comme un pilote de course. Toutes les commandes sont tournées vers lui afin de faciliter leur utilisation, même en situation limite et sans qu'il ait à lâcher le volant d'une main.

Les boutons Start/Stop et Audi drive select se trouvent sur différents satellites du nouveau volant sport multifonction plus en cuir, en série. Le volant Performance de l'Audi R8 V10 plus compte deux satellites supplémentaires (en série sur l'Audi R8 V10 plus, en option sur la V10) et intègre un bouton additionnel dédié au mode performance ainsi qu'un bouton de contrôle de l'échappement sport.

L'Audi virtual cockpit rassemble toutes les informations sur un même écran de 12,3 pouces (31 cm) au superbe graphisme. Le conducteur peut basculer d'un mode d'affichage à l'autre et, en mode personnalisé, adapter le tableau de bord digital à ses préférences. En mode performance, l'écran présente les informations relatives aux modes de conduite, à l'accélération, la décélération, les forces latérales ainsi que la puissance et le couple. En outre, un témoin de sélection prévient le conducteur lorsque le régime moteur limite est atteint. Le virtual cockpit s'utilise à partir du volant



multifonction plus, ce qui évite de lâcher celui-ci et permet au conducteur de se concentrer sur la route. Mais il peut aussi s'actionner à partir de la molette tactile ou des boutons de la console centrale.

Le système MMI navigation plus en série

La nouvelle Audi R8 bénéficie d'un équipement de série riche, incluant le système MMI navigation plus avec MMI touch. Comme pour les smartphones, une logique intelligente, facile à utiliser, remplace les menus par arborescence et inclut une fonction de recherche en texte libre. Les fonctions du véhicule peuvent être contrôlées depuis le volant, le terminal MMI sur la console centrale ou par contrôle vocal. Audi connect est le complément idéal au système MMI navigation plus. Il connecte la nouvelle Audi R8 via standard LTE grâce à la plateforme modulaire d'info-divertissement MIB 2^{ème} génération. Le système Bang & Olufsen et l'Audi phone box complètent l'équipement d'info divertissement.

Lancement sur le marché à l'automne 2015

La success story de l'Audi R8 a commencé avec le lancement de la première génération du véhicule en 2007. Depuis, Audi a vendu près de 27 000 unités dans le monde. Les précommandes de la nouvelle Audi R8 sont ouvertes depuis le mois de juin. L'Audi R8 V10 est disponible en France à partir de 167 000 € et l'Audi R8 V10 plus à partir de 199 000 €. Les premières livraisons auront lieu à l'automne.

Ouverture d'une nouvelle usine de production : Audi Böllinger Höfe

La nouvelle Audi R8 est produite dans une nouvelle usine dédiée, Audi Böllinger Höfe, à Heilbronn. De nouvelles méthodes sont utilisées dans le cadre de la construction de la carrosserie et de l'assemblage final et sont appliquées avec beaucoup de flexibilité, ce qui est adapté à la production de petits volumes nécessitant une intervention humaine. Cette nouvelle organisation permet de respecter les commandes des clients.

500 spécialistes très qualifiés travaillent dans la nouvelle usine de production de l'Audi R8, exploitée par quattro GmbH. Chaque voiture est construite avec la plus grande précision en 15 cycles de 30 minutes chacun. Avant livraison, toutes les super sportives sont soumises à de rigoureux tests de qualité.

Un couple de 920 Nm : l'Audi R8 e-tron

Le moteur 100% électrique de l'Audi R8 e-tron a été complètement redéveloppé. La structure ASF multi-matériaux de la nouvelle Audi R8 a été complétée par un module arrière en CFRP. Le coefficient de traînée de la voiture est bas, à 0.28, et la carrosserie est en CFRP et en aluminium. Les feux avant et latéraux sont équipés de l'éclairage spécifique à la gamme e-tron.

La batterie haute-tension en forme de T est positionnée de manière à ce que le centre de gravité soit bas et est intégrée à la structure ASF au centre du tuyau qui se trouve derrière le siège passager. La batterie haute-tension intègre un nouveau type de technologie lithium-ion. La capacité de la batterie a gagné 40 kw pour atteindre 90,3 kw, ce qui confère à l'Audi R8 e-tron une autonomie de conduite de 450 km avec une seule charge de batterie. Son Système de Charge Combiné (SCC) est conçu pour une charge rapide avec de l'électricité à courant continu. Le système de gestion thermique à l'aide d'une pompe à chaleur utilise les rejets thermiques et assure dans le même temps un contrôle efficace des températures de l'intérieur.

Les deux moteurs électriques situés sur le train arrière produisent chacun 170 kW de puissance et un couple de 460 Nm. La distribution du couple répartit le couple entre les roues pour un maximum de stabilité et de dynamisme. L'Audi R8 e-tron réalise le 0 à 100 en 3,9 secondes et sa vitesse maximale est bridée électriquement à 250 km/h. Le nouveau système intelligent de gestion d'énergie rend cette nouvelle voiture beaucoup plus efficace que la première génération d'Audi R8 e-tron. Le système de freinage électromécanique, situé lui aussi sur le train arrière, assure une importante récupération d'énergie lors du freinage.

Sur circuit : l'Audi R8 LMS

L'Audi R8 LMS, la nouvelle voiture de course, est présentée en même temps que l'Audi R8, la super sportive destinée à la route. Ceci démontre que la compétition automobile et les voitures de production sont intimement liées chez Audi. 50% des pièces sur les deux voitures sont identiques et leurs carrosseries sont produites à l'usine Audi Böllinger Höfe.

Le châssis de la voiture de course GT3 est basé sur une structure ASF multi matériaux, a été renforcé, en plus d'une cage de protection. De grandes parties de la carrosserie



sont en CFRP. Le poids homologué de la voiture de course s'élève à 1 225 kg. La production du moteur V10 est pratiquement identique : il produit près de 430 Kw. L'aérodynamisme de la voiture a également été redéveloppé et le coefficient de traînée a été réduit. Les diffuseurs spécifiques placés sur la carrosserie arrière et les panneaux lisses situés sur le soubassement de la carrosserie apportent plus de force d'appui à la nouvelle Audi R8 LMS. Il est ainsi possible d'utiliser un plus petit spoiler et d'augmenter la vitesse de la voiture.

Les ventes de la nouvelle Audi R8 LMS aux teams du monde entier débiteront lors du lancement de la saison 2016. La nouvelle voiture de course a déjà participé à plusieurs compétitions en 2015, notamment les courses internationales d'endurance telles que la course de 24h du Nürburgring et de Spa. Dix semaines seulement après sa présentation en avant-première au Salon de Genève, l'Audi R8 LMS a fait une entrée fracassante dans la compétition en remportant la victoire au Nürburgring.



En un coup d'oeil

La nouvelle Audi R8

Moteur

- Moteur V10 atmosphérique et fonctionnant à haut régime, avec lubrification par carter sec
- Deux versions de cylindrée de 5,2 L : 397 kW et 449 kW
Couple de 540 Nm ou 560 Nm, à 6 500 tr-min.
- Moteur fonctionnant à haut régime, avec réponse spontanée et sonorité caractéristique
- Cylindre à la demande (COD), mode roue libre, système start&stop, double injection du carburant, consommation de carburant jusqu'à 13% inférieure
- Hautes performances: 0 à 100 en 3,2 secondes, 0 à 200 en 9,9 secondes, vitesse maximale de 330 km/h (sur l'Audi R8 V10 plus)

Transmission

- Temps de changement de vitesse aussi rapide que l'éclair avec la boîte de vitesse S tronic à 7 rapports et changement de vitesse à commande électrique (shift-by-wire)
- Transmission intégrale permanente quattro redéveloppée à l'aide d'un embrayage multidisques, d'une répartition du couple entièrement variable et d'un verrouillage du différentiel arrière.

Châssis

- Doubles suspensions à triangles, à l'avant et à l'arrière, et contrôle des amortisseurs via Audi magnetic ride (série sur V10, option sur V10 plus)
- Freinage hautes performances , disques carbone-céramique en option sur V10, en série sur V10 plus en France
- Direction électromécanique redéveloppée , direction dynamique à démultiplication variable en option
- Roues de 19 pouces avec pneus à usage mixte de série et roues de 20 pouces en option
- Système dynamique Audi drive select avec quatre modes ; trois modes supplémentaires en option pour une performance dynamique maximale (standard sur l'Audi R8 V10 plus)



Design extérieur et structure Audi Space Frame (ASF)

- Design caractéristique des super sportives à moteur central
- Sideblades en deux parties, phares à LED de série, phares laser light en option et clignotants dynamiques
- Nouvelle structure Audi Space Frame multi matériaux en aluminium et en CFRP ; structure ASF de 200 kg, poids à sec de 1 454 kg (Audi R8 V10 plus)
- Excellentes valeurs de rigidité, résistance aux chocs et acoustique
- Concept aérodynamique avec appui élevé

Design intérieur

- Lignes pures, poste de conduite monoposto et tableau de bord fixe
- Sièges sport re-conceptualisés. Sièges baquets plus légers sur Audi R8 V10 plus
- Nouveaux coloris et matériaux. De nombreuses possibilités de personnalisation.

Commandes et affichage

- Commandes orientées conducteur ; toutes les fonctions clé sur le volant
- Deux versions de volant avec deux ou quatre boutons satellite
- Audi virtual cockpit configurable par l'utilisateur + écran de 12'3" avec affichage haute résolution de série. Affichage d'informations supplémentaire via le mode « performance » : couple, puissance, température du carburant et des pneus, force gravitationnelle et temps au tour sur circuit

Info-divertissement et Audi connect

- MMI navigation plus avec MMI touch de série : concept d'exploitation redéveloppé avec une hiérarchie de navigation plate, comme sur smartphone et fonction de recherche par texte libre
- Technologie basée sur la seconde génération de la plateforme module d'info-divertissement (MIB)
- Audi connect, Audi phone box et Bang & Olufsen sound system en option

Production

- Production à Audi Böllinger Höfe, à l'usine Audi de Neckarsulm
- Production flexible et innovante, faisant appel à un travail à la main minutieux



Audi R8 e-tron

- Voiture sportive 100% électrique avec excellentes performances, deux moteurs électriques avec puissance combinée de 340 kW et couple combiné de 920 Nm
- 0 à 100 en 3,9 secondes. Vitesse maximale : 250 km/h (bridée électriquement)
- Nouvelle technologie de batterie avec haute densité de puissance et densité d'énergie
- Autonomie maximum étendue à 450 km maximum

Audi R8 LMS

- Voiture de course GT3 destinée aux pilotes de course du monde entier ; premières courses en 2015
- Près de 50% des pièces identiques à celles de l'Audi R8 de production, dont le moteur
- Structure ASF avec cage de protection et carrosserie composée de CFRP



Full version

The new Audi R8: Audi has further sharpened its sporty vanguard vehicle

The previous model was already the sporty vanguard of the brand – and this applies to the second generation Audi R8* even more. The newly conceptualized high-performance sports car has been made even tauter and stronger, both on and off the race track. Embodied in its DNA is know-how acquired in the numerous car racing successes that Audi has achieved over the years – primarily in endurance racing events. The sport prototypes have won the 24 hours of Le Mans 13 times since 2000, and the R8 LMS contributed seven more overall victories in 24-hour races since 2009.

Its character

“The new R8 V10 plus* is the most powerful and fastest production Audi ever,” says Prof. Dr. Ulrich Hackenberg, Audi Board Member for Technical Development. “With the new Audi R8, our engineers are transferring their bundled racing expertise from the race track to the road. No other Audi evokes such dynamic passion, and none is so closely related to a race car.”

The mid-mounted engine in the Audi R8 is not only a classic concept in motorsport; it is also an integral part of the brand’s sporty DNA. It was already used in the Grand Prix race cars brought to the starting grid by Auto Union in the 1930s, with the powerful engines located forward of the rear axle – which was a revolutionary step at the time. In the year 2000, Audi won the 24 hours of Le Mans for the first time with the LMP R8 prototype. By 2005, the car which provided the name for today’s high-performance production sports car had taken five overall victories at the Sarthe. It was then retired and replaced by the Audi R10 with a TDI engine.

The R8 also enjoyed much success in customer racing – car racing had been a key aspect of its model development from the start. In 2009, the R8 LMS embarked on its career, and by 2014 it had raced to 26 GT3 championships worldwide, 23 other titles and seven overall victories in 24-hour endurance races. Its technology was, and today – in its second generation – it still is closely related to that of the road-version sports car. In the second generation, the road-version sports car and the motorsport version, the R8 LMS, were developed simultaneously for the first time and were presented together



at the 2015 Geneva Motor Show. Close cooperation between race car engineers, motorsport specialists and developers has given the new Audi R8 a significant boost in performance.

Engine

Offering immense power and extremely good engine response – the further developed 5.2 FSI in the new R8* is a high-powered engine that was systematically designed for high engine speeds. As soon as the engine is started, it revs at 2,500 rpm for fractions of a second. Under load, the naturally-aspirated ten-cylinder engine develops a very unique sound – a throaty hissing and roaring.

Audi offers the V10 with 5,204 cc of displacement in two versions. On the R8 V10, the long-stroke engine (bore x stroke: 84.5 x 92.8 mm (3.3 x 3.7 in)) has a power output of 397 kW (540 hp) at 8,250 rpm, and its maximum torque of 540 Nm (398.3 lb-ft) is available at 6,500 rpm. For the R8 V10 plus, these values are 440 kW (610 hp) and 560 Nm (413.0 lb-ft) at the same engine speeds. At both power levels, the 5.2 FSI can rev up to 8,700 rpm – at limited speed, the pistons travel a total of 26.9 meters (88.3 ft) per second.

In the new Audi R8 V10 plus, the engine's specific power is 117.2 hp per liter displacement. Each horsepower only needs to move 2.38 kg (5.2 lb) of weight, because the high-performance sports car only weighs 1,454 kg (3,205.5 lb) (dry weight). This leads to impressive performance figures: The fastest production Audi ever catapults from 0 to 100 km/h (62.1 mph) in 3.2 seconds and from 0 to 200 km/h (124.3 mph) in 9.9 seconds. It can continue accelerating to a maximum speed of 330 km/h (205.1 mph). The new Audi R8 V10 accelerates from 0 to 100 km/h (62.1 mph) in 3.5 seconds and has a top speed of 320 km/h (198.8 mph).

Compact powerplant: the V10

The V10, which is produced at the engine plant in Győr, Hungary, in part by manual assembly, is very compact. Its low mounting position in the car results in a low center of gravity. The offset between cylinder banks is 18.5 mm (0.7 in). The cylinder firing sequence is 1 – 6 – 5 – 10 – 2 – 7 – 3 – 8 – 4 – 9.

The crankshaft is designed as a common pin shaft. The connecting rods of opposing pistons are joined to a common crank pin, which results in alternating firing intervals of 54 and 90 degrees. This rhythm makes a big contribution toward producing a very



unique, motorsport-like sound. Two flaps in the exhaust system let the driver choose between a comfort-oriented sound and a sporty sound. The entire sound stage is authentic – including the babbling sound when the foot is taken off the accelerator pedal and a more roaring sound when shifting gears under full load.

The cylinder crankcase of the 5.2 FSI is manufactured in a complex low-pressure die-casting process with a high-tech aluminum alloy that combines low weight and high strength. The cylinder liners are honed from the solid piece by exposing the hard silicon crystals. The bed plate construction of the crankcase gives it maximum rigidity, and gray cast iron bearing brackets reduce heat expansion and thereby improve bearing play. The forged crankshaft and the connecting rods that are made of forged steel combine high strength and low weight, and the pistons are forged from an aluminum alloy.

Reliable under all conditions: dry sump lubrication

The motor oil, which is temperature-controlled in a dedicated cooler, comes from a dry sump – a principle borrowed from car racing. This makes it possible to mount the engine extremely low. The pump module, which operates with multiple suction stages, assures proper lubrication under all conditions – including during lateral accelerations of around 1.5 g, which are possible in the new R8.

The camshafts are chain driven, and they operate on the rear side of the engine. All four camshafts can be adjusted by up to 42 degrees crank angle. This enables a broad range of valve timing for the 40 valves that are actuated by roller cam followers. The exhaust valves are sodium filled for better cooling.

Compared to the previous engine, Audi has configured the V10 for even more spontaneous high power output. The compression ratio grew from 12.5:1 to 12.7:1, valve timing was configured for good chamber filling at high engine speeds, and the intake channels were optimized in the lightweight variable intake manifold. The machined inlet ducts and the valve shaft diameter of just 4.8 mm (*0.2 in*) also contribute to optimal flow into the cylinder.



These extraordinary efforts have led to convincing results: The 5.2 FSI revs just as spontaneously, and even reaches high revs a bit quicker than the best short-stroke engines on the global market. One indicator of this is the jump to full-load, which describes the engine's spontaneous throttle response. This means that as soon as the driver presses the accelerator pedal fully while idling in the stationary car, full load is already available after 6.6 tenths of a second – this is nearly 20 percent faster than in the previous engine. This means that the driver can apply measured acceleration ideally during a sporty style of driving – whether on the race track, during a controlled drift or on snow.

New combustion process: FSI plus MPI

Dethrottling of the air induction system goes hand in hand with a new combustion process. Along with direct injection into the combustion chambers (FSI), the V10 adds fuel injection into the induction manifold (MPI). Two newly developed control units operating by the master-slave concept are at work: each handles part of the large amount of computing work, and together they control the dual injection process.

In the lower part-load range, only MPI injection is used. The high vacuum pressure in the induction manifold vaporizes the fuel very well, which leads to clean combustion. In the moderate load range, induction manifold and direct injection are used in equal measures. In the full-load range, the FSI system, which builds up a pressure as high as 200 bar, performs around 85 percent of the injection. The directly injected fuel swirls intensively, cooling the walls of the combustion chambers, which reduces the tendency to knock. The remaining MPI share contributes to a high charge concentration and to a boost in power.

High efficiency gain: CO₂ is 33 g/m (53.1 g/mi) lower

Despite its highly dynamic character, the new Audi R8 consumes far less fuel than the previous model. Its V10 version had a combined NEDC fuel consumption of 13.1 liters per 100 km (18.0 US mpg) (equates to 305 g/km (490.8 g/mi) CO₂) – while it is now just 11.4 liters per 100 km (20.6 US mpg) (272 g/km (437.7 g/mi) CO₂), which represents a 13 percent reduction. In the case of the V10 plus, fuel consumption was reduced from 12.9 liters/100 km (18.2 US mpg) (299 g/km (481.2 g/mi) CO₂) to 12.3 liters per 100 km (19.1 US mpg) (287 g/km (461.9 g/mi) CO₂).



The new cylinder-on-demand (COD) technology makes a substantial contribution toward this efficiency gain. Under low to intermediate load conditions – when one of the four upper gears is engaged – it shuts down the cylinders of the left or right bank by deactivating their injection and ignition processes.

If the deactivation phase lasts longer than 30 to 60 seconds, the COD system reactivates the bank to prevent cooling of the catalytic converter, and it deactivates the other cylinder bank. During a long COD phase, it continually alternates back and forth between the two banks. The driver does not perceive this at all. The control unit smooths the transitions, each of which takes around three-tenths of a second, by shutting off the cylinders of each bank sequentially.

Along with the COD system, the 5.2 FSI in the new Audi R8 has other efficiency technologies on-board as well. When the comfort mode of the Audi drive select dynamic driving system is active, and the vehicle speed is under 55 km/h (*34.2 mph*), the seven-speed S tronic switches over to freewheeling operation when the driver releases the accelerator pedal. It disengages both clutches, and the high-performance sports car coasts. Just before stopping, the start-stop system shuts the engine off entirely; the subsequent engine restart is performed gently.

Seven-speed S tronic

The drivetrain is a special highlight of the new R8* technical concept; it features a seven-speed S tronic that executes gear shifts within hundredths of a second and an intelligent quattro drive system that provides maximum stability and dynamism on any road surface. Audi is presenting the latest state of its technology here.

The seven-speed S tronic is standard with both engine versions – the V10 and the V10 plus. Operating commands are all transmitted electrically (shift-by-wire). The driver can manually shift gears using the gear selector lever or the shift paddles on the steering wheel. Or the driver can have the S tronic shift automatically in the D or S program. At the push of a button, the driver can start off with launch control which engages the clutch at around 4,500 rpm – it applies the power of the V10 to the road with perfectly controlled tire slip.



Based on its three-shaft layout with one dual drive shaft and two output shafts, the seven-speed S tronic mounted behind the engine is very compact. Its thermal management, which coordinates with the engine, uses an oil-water heat exchanger that is mounted to the transmission. The mechatronics, which are set up as a separate block, activates and lubricates the high-tech transmission. One oil pump suffices to supply oil to the gear wheel sets, clutches and integrated differential lock.

Two multi-plate clutches, one behind the other, operate two independent transmission sub-units. Clutch K1 transfers the torque via a solid shaft to the fixed gear wheels for gears 1, 3, 5 and 7, which are located in the rear section of the transmission housing. A hollow shaft rotates around the solid shaft. It is connected to a second K2 clutch and acts on the gear wheels for gears 2, 4, 6, and reverse. Mounted on output shaft 1 are the gear wheels for gears R, 4, 5 and 1, while the gear wheels for gears 2, 6, 3 and 7 are mounted to output shaft 2.

Both transmission sub-units are continually active, but only one is connected to the engine at any one time. The shifting process runs so smoothly and comfortably that the driver hardly notices it. Gear shifts take just a few hundredths of a second, and they are executed with nearly no interruption of propulsive power.

On output shaft 2, the seven-speed S tronic has a connection to the propeller shaft that runs through the bed plate of the dry sump oil pan to the front axle. An electrohydraulically activated and electronically controlled multi-plate clutch is mounted there, forming a block with the front differential.

quattro drive

The quattro drive system of the R8* has been fully re-developed. The combination of its high-performance mechanical system and software precisely tuned to the mid-engine concept makes it possible to realize dynamic handling properties in a new dimension. The intelligent all-wheel drive software continually distributes torque ideally according to the driving situation, driver inputs and ambient conditions.



The electrohydraulic multi-plate clutch integrated in the front differential transmits the calculated torque to the front wheels within just a few milliseconds. Unlike the previous component, the new clutch can distribute torque between the axles fully variably – it does not have any fixed underlying distribution. The level of maximum torque transfer was increased significantly for the best possible traction and dynamic handling.

The quattro drive is connected to the engine's coolant circulation system, which utilizes three large radiators at the front of the car. This solution ensures that the clutch can perform its control work fully and precisely under all conditions. A temperature sensor and a pressure sensor continually monitor conditions and adapt control parameters as necessary. Although the multi-plate clutch operates with minimal slip – which is necessary for defined transmission of torque – it surpasses the previous viscous coupling when it comes to efficiency.

The quattro drive is integrated in the Audi drive select dynamic handling system, which lets the driver choose between the basic modes comfort, auto, dynamic and individual. On the R8 V10 plus (and as an option on the V10), there are supplemental programs in performance mode: dry, wet and snow. They adapt dynamic handling parameters to the friction coefficient of the specific road surface.

The purely mechanical rear differential further improves traction and dynamic handling – it exhibits a 25 percent locking effect in traction and 45 percent in thrust. It is precisely designed for the dynamic character of the new R8 and the actively controlled quattro drive system. This results in turn-in behavior that practically eliminates understeer. The mid-engine is positioned very near the vertical axis of the car's center of gravity, so the inertia of its mass hardly comes into play in fast changes of direction. The axle load distribution is 42:58 – an ideal figure.

Chassis

Whether on a race track or a mountain pass road – the new high-performance sports car from Audi impresses with its dynamics. It executes steering inputs nearly without delay, and it reaches very high speeds in curves. It does this while remaining fully neutral.



The Audi drive select system and the performance programs dry, wet and snow (standard on the V10 plus, optional on the V10) add new facets to the driving experience. The differences in handling can be experienced, and control limits are shifted far into the dynamic limit range.

The chassis offers greater comfort than in the previous model. Double wishbones made of aluminum – a classic design principle from car racing – are used in the suspensions for all four wheels. Rubber-metal mounts transfer lateral forces into the car body in a defined way, while assuring good elasticity in a longitudinal direction. New transverse link mounts at the front and rear axles enhance comfort, stability and precision. The car's track width is 1,599 mm (5.2 ft) at the rear and 1,638 mm (5.4 ft) at the front.

The electromechanical rack power steering system has also been redesigned from scratch. It provides differentiated road feedback and also saves a tremendous amount of energy compared to the hydraulic steering system in the previous model. It has a steering ratio of 15.7:1, and power steering assist varies as a function of the vehicle driving speed.

Dynamic steering is available as an alternative for both engine versions. Its superposition gear varies the ratio as a function of vehicle speed between 10.0:1 and 17.5:1. In a parking garage, the steering is very direct, and on the freeway it is indirect and smooth. In the performance programs (standard on the V10 plus, optional on the V10), a fixed ratio of just 13:1 is used. At the curve limit, the dynamic steering system countersteers with tiny impulses to add more stability.

A bit stiffer: the new Audi R8 V10 plus

The chassis tuning differs between the two engine versions – the top version has stiffer springs and dampers on-board (optional on the R8* V10). As an option, Audi can deliver the Audi magnetic ride system in either version – it adapts the operating mode of the dampers to the profile of the road and style of the driver – individually for each wheel at millisecond cycles. A synthetic oil in the pistons of the shock absorbers has very small magnetic particles embedded in it. When a voltage is applied to a coil, a magnetic field is generated in which the particles align transverse to the direction of flow. They thereby restrict the flow of oil through the piston channels.



Audi magnetic ride is incorporated into the control of the Audi drive select dynamic driving system, which is standard equipment in the new Audi R8. The driver can use this system to vary the mode of operation of key technical components over four basic modes: comfort, auto, dynamic and individual. In the dynamic stage, the quattro drive system assists in executing controlled, safe drifts. The accelerator pedal, steering, shift points and sound are even stiffer, so that the dynamics can be experienced. In the auto mode, on the other hand, traction has priority – this translates into high speed and fast lap times on the race track.

In the performance mode of the new Audi R8 V10 plus (optional on the V10), the driver can use a dedicated satellite button with a turn wheel on the multifunction steering wheel plus to select one of the programs dry, wet or snow.

They too are configured for maximum dynamic performance, and they take the friction coefficient of the road surface into consideration. The Audi drive select setting also influences Electronic Stabilization Control (ESC). On wet or snow-covered road surfaces, for instance, ESC modifies the thresholds of the ASR and ABS control systems accordingly.

Best grip: the wheels and tires

The new Audi R8 is equipped with factory-installed 19-inch wheels. On the V10, the cast alloy wheels have a 5-V-spoke design, while the V10 plus has forged wheels in 5-twin-spoke design in matt titanium look. The tire sizes are 245/35 front and 295/35 rear. As an alternative, Audi offers three other 19-inch versions, one of them for the winter. On the 20-inch wheels – all in 10-spoke Y design, but with different finishes – the tires are 245/30 and 305/30 in size, and optional sport tires are available. Of the four 20-inch versions, one is intended for winter driving. Tire pressure monitoring with direct measurement of tire pressure and temperature is a standard feature.

There are large-size brakes behind the wheels. The standard steel disks of the new Audi R8 V10 have wave-shaped contours (wave design) that make them lightweight. They are internally ventilated and perforated. They are joined to aluminum brake caps by stainless steel pins which prevent the transfer of peak temperatures. Operating at the front wheels are eight-piston fixed calipers and disks 365 mm (*14.4 in*) in diameter; at the rear wheels, four-piston calipers and disks 356 mm (*14.0 in*) in diameter are used. The new electromechanical parking brake activates two dedicated floating calipers.

380 mm (15.0 in) diameter: the ceramic brakes



Audi installs brake disks made of carbon-fiber-reinforced ceramic on the new R8 V10 plus (optional on the V10). The geometry of their cooling channels ensures fast heat dissipation, and the friction ring is bolted to a forged aluminum brake cap. They are 380 mm (*15.0 in*) in diameter in front (with six-piston fixed calipers) and 356 mm (*14.0 in*) at the rear (with four-piston calipers). The ceramic disks are 15.2 kg (*33.5 lb*) lighter in weight than their steel counterparts. They are extremely temperature resistant and have a long service life. The brake calipers differ from one another in color too. The steel brakes are painted in gloss black – or optionally gloss red – and they display R8 logos. The calipers of the ceramic disks shine in anthracite colored paint with the “Audi ceramic” signature.

The Electronic Stabilization Control (ESC) system that is being used is also a new development. It builds up brake pressure so quickly and precisely that its work is hardly perceptible. ESC may be switched over to a sport mode, or it may be deactivated altogether. New system functions include the multicollision brake assist system – a function that assists the driver by performing targeted braking maneuvers after an initial collision to avoid skidding and thereby hazardous secondary collisions.

ESC rounds out the handling properties of the new Audi R8. In fast driving through curves, torque vectoring – which is a software function of ESC – applies minimal braking interventions at the wheels on the inside of a curve. The difference in propulsive forces causes the high-performance sports car to turn into the curve very slightly – making its handling even more precise, sporty and stable. In the dynamic mode, the system is configured for maximum driving enjoyment. It assists in spontaneous turn-in and controlled drifts by active adjustments and slight brake interventions when oversteer occurs.

Exterior design

No other production car from Audi is closer in concept to a race car than the new R8*. The occupant cell that is placed far forward, the strong emphasis of the wheel arches and the long back recall the look of a Le Mans race car – the R 18 e-tron quattro. Compared to the previous model, the car’s length (4,426 mm (*14.5 ft*)), height (1,240 mm (*4.1 ft*)) and wheelbase (2,650 mm (*8.7 ft*)) have not changed significantly, but the width has grown by around four centimeters (*1.6 in*) to 1,940 mm (*6.4 ft*).



The influential design ideas of the previous model are expressed in a tauter, more technical and precise way in the new Audi R8. Horizontal lines define the front view. The very sculptural Singleframe radiator grille in honeycomb look – executed in a matt finish on the V10 and in a gloss finish on the V10 plus – has a very broad and low design. Three-dimensionally formed surfaces join it to the wedge-shaped headlights; they emphasize the tension of the design. The four rings are placed on the hood.

37 LEDs per unit: LED headlights with laser spot

Like the grille, the large trapezoidal air inlets also have inserts in honeycomb look. Their two vertical slats match the blade in the headlights that are part of the daytime running lights signature. The vertical blade is anodized blue in the version with the laser spot high-beam lights – a version that supplements the standard LED headlights with their 37 LEDs each.

The laser spot doubles the range of the high-beam light. In each headlight there is a module with four powerful laser diodes that are just 300 micrometers in diameter. They generate a blue laser beam with a wavelength of 450 nanometers. A phosphorus converter converts it into white light with a color temperature of 5,500 Kelvin that is pleasing to the human eye. The laser spot – which is active outside of urban areas at speeds of 60 km/h (37.3 mph) and above – offers tremendous advantages in terms of visibility and safety to drivers. An intelligent camera-based sensor system detects other road users and actively adjusts the light pattern to dim the light intensity specifically for them.

Audi combines the new technology with the dynamic turn signals, which are placed along the upper edge of the headlight together with the daytime running lights. Depending on the model, the turn signals are implemented as either individual LEDs or LED blocks. As soon as the driver activates the turn signal, these LEDs light sequentially from inside to out – i.e. in the direction in which the driver is turning.

The side view of the new Audi R8 exhibits taut, clean lines that delineate curved surfaces. The contours above the wheels reference the quattro drive system. The flowing shoulder line connects the wheels with one another while dividing the sideblade in two visual elements – an upper and a lower half.



The door handles are placed nearly invisibly in the shadow of this line. This new design solution makes the high-performance sports car appear even longer and more dynamic. The light edges on the side sills are recreated in the aerodynamic blades of the Audi R18 e-tron quattro.

The fuel lid is made of aluminum in both engine versions; it is integrated in the upper blade on the right side of the car and has an R8 logo. To open it, the driver presses on the smooth surface to the left of the fuel lid, then the driver presses the nozzle right into the filler neck – just like on a race car, it is no longer necessary to unscrew a cap.

For downforce: the wings of the R8 V10 plus

At the rear, the design also documents the affinity of the new Audi R8 for motorsport – its dominating elements serve to generate downforce. The R8 V10 plus has a large fixed rear wing made of carbon-fiber-reinforced polymer (CFRP); on the R8 V10, the spoiler is electrically extended at a speed of 120 km/h (*74.6 mph*). The contours on the two sides of the rear window, through which the engine is visible, contribute to smooth air flow over the car.

The diffuser with its distinctive slats is extremely wide and is flanked by the two trapezoidal tail pipes of the exhaust system. They are chrome-plated on the V10 and gloss black on the V10 plus as well as with the optional sport exhaust system. The prominent horizontal lines give the rear body a very wide look. The verticals run diagonally downward and outward – forming a triangle and emphasizing the stance of the new Audi R8 on the road.

The large inlet openings for the engine compartment – also in honeycomb look with upright slats – form a single visual unit together with the lights. Their fork-like contours produce a distinctive red signature when the daytime running lights are activated. The adaptive brake light flashes at a faster frequency with hard braking. Each tail light integrates 118 individual LEDs, which generate an absolutely uniform light pattern. The dynamic rear turn signal lights are a standard feature.

Audi offers its new high-performance sports car in eleven colors. The solid finish paints are: dynamite red, ibis white and Vegas yellow. The metallic tones are: camouflage green, floret silver, mythos black, Suzuka gray and tango red.



The color palette is rounded out by the pearl effect paint Daytona gray, the crystal effect macaw blue and the matt finish camouflage green. The Audi exclusive program lets customers have any paint colors blended according to their wishes.

Six versions of sideblades are available – the paint colors are: ice silver, metallic (standard on the R8 V10), Kendo gray, mythos black, oxygen silver and titanium gray, matt as well as one version in gloss CFRP (standard on the R8 V10 plus). As an alternative, customers may choose any color for the sideblades in the Audi exclusive program.

Audi Space Frame in multimaterial mixed construction

Like the previous model, the new R8* also has a body in ASF (Audi Space Frame) construction – which is synonymous with extreme lightweight design. It weighs just 200 kg (*440.9 lb*), which is ten kilograms (*22.0 lb*) less than before – thanks to a concept being used at Audi for the first time which combines aluminum and carbon-fiber-reinforced polymer (CFRP). Large components of the occupant cell consist of CFRP, while the front and rear body modules are built exclusively of aluminum. The new multimaterial ASF forms the basis for the lightweight design concept of the high-performance sports car.

In its lightweight design strategy, Audi does not just rely on a single material, but instead on an intelligent material mix – according to the motto “The right material in the right amount at the right place.” The new material CFRP is used where it can attain better results than aluminum. CFRP is used for the rear wall, the center tunnel and the three-part B-pillars. These large components, which are produced in the efficient resin transfer moulding (RTM) process, form the high-strength backbone of the ASF that is nearly torsion-free. They account for a 13 percent share of the ASF.

CFRP parts differ from one another in their structure, depending on where they are used. Audi fully exploits the material’s specific strengths. In the crossmember of the rear wall, where maximum strength in a transverse direction is what counts, the fiber layers are largely aligned unidirectionally. Up to 14 of them are placed on top of one another to form a five millimeter (*0.2 in*) thick sheet with very high tensile strength of 3,950 MPa (megapascals). In the B-pillar reinforcements, on the other hand, the layers are aligned in all directions to support both longitudinal and transverse loads. The tensile strength of these parts is 900 MPa.



The front and rear body modules of the new R8 are constructed entirely of aluminum – from semi-finished goods that include castings, profiles and sheets. The cast nodes, which make up 20.8 percent of the ASF, have complex interior geometries that make them well suited for absorbing large forces while offering plenty of versatility and design freedom. The A-pillar nodes, for example, join key parts of the front body and the occupant cell to one another. They consist of a new, high-strength alloy with a tensile strength of 350 MPa.

The extruded profiles, together with the cast nodes, form the framework for the front and rear body modules. They have a 47.2 percent material share in the ASF. The profiles too offer a lot of design flexibility. One example is the upright profile between the suspension strut mount and the chassis joint of the rear axle. Over its approximately 60 cm (23.6 in) of length, its wall thickness varies between 1.5 mm (0.1 in) and 6.2 mm (0.2 in), which saves 1.3 kg (2.9 lb) in weight. Audi also took new paths in lightweight design with the structural struts that stiffen the rear body – oval aluminum profiles that weigh just one kilogram (2.2 lb) form the upper structure.

Along with this optimization of topologies, ASF developers also performed a new type of functional integration. Cast nodes from the new, high-strength alloy join the control arms directly and rigidly to the ASF. The floor of the luggage compartment is made of sheet aluminum, and it serves as a shear area that improves crash properties.

Made entirely of aluminum: the exterior skin

The outer skin of the new Audi R8, including doors and lids, is produced entirely of aluminum. Alloy sheets make up an 11.2 percent share of the ASF and are primarily used for the floor of the occupant cell and its bulkhead. A 0.6 percent share is steel, 0.5 percent other materials and 6.7 percent fasteners.

In the ASF of the new Audi R8, the combined length of the welds between the aluminum components is a full 89 meters (292.0 ft). The aluminum and CFRP are joined exclusively by cold methods – the ASF contains 270 semi-hollow punch rivets, 207 blind rivets, 241 metric screws and 270 self-tapping screws. Cathodic dip coating, an engineered adhesive and a special seal ensure that the metal alloy does not corrode in contact areas with the CFRP.



Compared to the previous model, the ASF of the new Audi R8 has been significantly improved in all criteria. It has gained 40 percent in static torsional rigidity – which makes it an excellent material for ensuring precise handling, high crash safety and acoustically quiet vibration behavior. The new multimaterial ASF attains a top figure in the sports car segment for its lightweight index – a measure of the relationship between weight, size and stiffness. If Audi had built it in the previous aluminum technology, the ASF would have been 32 kg (*70.5 lb*) heavier.

Aerodynamics

Aerodynamic development of the new R8* was particularly focused on one parameter that plays a predominant role in car racing – downforce, i.e. the force that presses the car down onto the road and enables high speeds through curves. Here, the Audi R8 V10 plus enters a new dimension. At its top speed, the car generates 140 kg (*308.6 lb*) of downforce, of which 100 kg (*220.5 lb*) is at the rear axle.

The c_D figure of the new Audi R8 V10 plus is 0.36, and its low height results in a relatively small frontal area of 2.01 m² (*21.6 sq ft*) – which is a requirement for the 330 km/h (*205.1 mph*) maximum speed that the top version can reach.

On the exterior skin, the rear spoiler is very important for downforce. On the R8 V10 plus it is implemented as a fixed wing, and its profile was derived from Audi DTM race cars. The wing works together with the large diffuser on the underbody to create a trailing edge that generates as little turbulence as possible.

The diffuser is located at the height of the rear axle. It takes the accelerated air from the underbody and brings it back down to the speed of the ambient air without excessive turbulence. This suction effect lets the air flow faster, heightening downforce. Two venturi spoilers guide the high-speed air into the diffuser and nearly double its effectiveness. In the diffuser, longitudinal ribs channel the air flow so that it does not concentrate in the middle.

For good steering response: 40 kg (*88.2 lb*) of downforce at the front axle

Drivers perceive the 40 kg (*88.2 lb*) of downforce that the new Audi R8 V10 plus generates at the front axle in a positive way, even on fast straight-aways. This downforce prevents the steering from becoming light.



In the vicinity of the front axle there are two small diffusers which divert air through the wheel housings and thereby also serve to cool the brakes. Each of them works together with two round-bodied elements at the leading edge of the air flow and venturi spoilers.

The underbody of the new high-performance sports car, including the propeller shaft, is nearly fully enclosed by a smooth cover. In the rear body, this cover also contributes to lateral stiffness. Under the engine, nozzles known as NACA nozzles guide the cooling air to the V10 engine and the seven-speed S tronic. The pan of the dry sump lubrication system is not covered.

The V10 draws its inlet air via a screen under the rear window and via two long connecting pieces that lead to the sideblades. Flaps manage the switching tasks and thereby control inlet noise. The engine compartment is temperature controlled in multiple ways: by narrow louvers next to the rear window, large openings under the tail lights and a narrow opening slot above the diffuser. On the R8 V10 plus, another outlet is added beneath the rear wing. In the front body, the cooling air flows through enclosed channels with little turbulence – another solution from car racing.

Interior

The taut lines of the new R8* can also be seen in the interior. It stands for aesthetic lightweight design, which is a fundamental technical principle at Audi. Its most eye-catching element is the “monoposto” – the large curved arch that encircles the area in front of the driver’s seat and conveys the atmosphere of a race cockpit. It also has knee pads in its lower area. The “monoposto” encloses the Audi virtual cockpit, which is integrated into a freestanding housing.

The entire instrument panel has a lean and lightweight look; it appears to hover without being joined to the center tunnel console. The new Audi virtual cockpit replaces the central MMI monitor that the previous model still had. In its place there is a large air vent and the control panel for the deluxe automatic air conditioner. Its cylindrical controls bear a visual resemblance to the jet engine turbines of an airplane, while the vents with their vertical louvers recall the air intake of a race car.



The wide console of the center tunnel is also oriented toward the driver. It has a row of switches for secondary functions and the newly designed, low-profile gear lever for the seven-speed S tronic. Behind it is the MMI terminal with MMI touch – the touch-sensitive rotary/push-button switch. A large storage compartment, which can be equipped with the Audi phone box as an option, completes the features.

The long wheelbase of 2.65 meters (*8.7 ft*) and shoulder width of 1.40 meters (*4.6 ft*) make the interior of the new Audi R8 spacious. Under the hood, there is a 112-liter (*4.0 cu ft*) luggage compartment. The area behind the seats, upon which a golf bag can be stowed, offers an additional storage capacity of 226 liters (*8.0 cu ft*).

Operating concept: like in a race car

The driver sits in the new Audi R8 like in a race car. The entire operating concept focuses on the driver alone, who can operate all key functions without having to take the hands off the steering wheel or look away from the road.

The multifunction steering wheel plus has two large round satellite buttons – in addition to its push-buttons for the MMI. One is used to start and stop the engine, while the other is used to select the basic modes of Audi drive select. The performance steering wheel in the Audi R8 V10 plus (optional on the V10) adds two more buttons: one to control the exhaust system and the other to select the dry, wet or snow program of the performance mode.

The newly conceptualized, low-mounted seats integrate the driver and passenger into the vehicle perfectly – in a sporty, extended position. The new R8 V10 has standard sport seats with integrated head restraints on-board. They have power adjustments for height and seat back angle. Heated seats are standard. Optional features include power longitudinal adjustment and pneumatic functions for the lumbar supports, seat and backrest side bolsters.

On the new Audi R8 V10 plus, bucket seats with very high side bolsters are standard (optional on the V10). In the upper area of the seat back there is an embossed R8 logo. These seats offer power height adjustment, and longitudinal adjustment is manual. Each of the newly developed bucket seats follows a strict lightweight design approach and offers comfortable sportiness. Side airbags are standard with both types of seats.



The upholstery material in the R8 V10 is a combination of black Alcantara and leather. Audi can deliver fine Nappa leather quality as an option (standard on the V10 plus), and customers can choose from two color schemes. Together with the black instrument panel, there are the sporty tones black, rotor gray and express red. In combination with the granite gray cockpit, the elegant colors Vermont brown and pergament beige are also offered. The black covers may be upgraded to include contrasting stitching that matches the exterior paint.

In the fine Nappa leather interior, Audi offers versions that provide upholstery for various features. They include a dynamic diamond pattern which gives the seats a visually lean appearance – the diamonds grow larger from top to bottom. The options line-up is rounded out by two leather packages and four Alcantara versions for the headlining, including two with diamond pattern.

Matt CFRP is used on the Audi R8 V10 plus for parts of the “monoposto” architecture and for inlays that appear in the doors and on the instrument panel and center tunnel console. On the R8 V10 they are in anthracite colored anodized paint. As an option, Audi can also deliver this in CFRP, and in both engine versions it is also available for the housing of the Audi virtual cockpit and the air vents. Anthracite-colored titanium paint and a black piano finish look are offered as alternatives. On the top model, the pedals and foot rests are stainless steel (optional on the R8 V10).

In addition, quattro GmbH offers its customers a comprehensive line-up of options for further customizing the interior. For instance, illumination and personalization are available for the aluminum door sill trims. Customers can choose from many different upholsteries, trim panels and colors – the selection is nearly unlimited.

Regardless of which colors and materials the customer selects, the interior finish reflects the high Audi craftsman quality. It can be discerned in all of its details – from the precise decorative stitching on the upholstery to the narrow, accurate parallel seams to the climate control unit in piano finish look.



Audi virtual cockpit and the new MMI

The new R8* presents two innovative brand technologies in its operating concept. The Audi virtual cockpit is the digital instrument cluster of the future, and its MMI offers a new, easy-to-understand operating logic. The TFT display of the Audi virtual cockpit has a 12.3-inch diagonal and a high resolution of 1,440 x 540 pixels. It displays razor-sharp, bright and contrast-rich images that are free of reflections. Working in the background is a Tegra 30 chip from Audi partner NVIDIA. It was designed for low electrical consumption and has separate audio, video and image processing units. Its working memory is two gigabytes.

The Audi virtual cockpit presents all information with attractive and elaborately rendered effects. The needle of the rev counter, for instance, is computed 60 times per second, so it moves absolutely fluidly, even when revving the engine under full load. Scrolling operations through lists are based on a physical model that considers inertia, elasticity and damping. The color scheme of the display varies according to the basic menu that is selected – it is orange for the media menu and green for the phone menu.

The driver can switch between two user interfaces by pressing the “View” button on the steering wheel. In infotainment mode, a large central window offers a lot of space for the navigation map or lists from the phone, radio or audio areas. In this mode, the rev counter and speedometer are shown as small round instruments. In the classic view, the central window is smaller, and the instruments appear about the same size as analog gauges.

In another third view, the performance mode, a large, central rev counter dominates the screen (standard on the R8 V10 plus, optional on the R8 V10). When the seven-speed S tronic is being operated in manual mode, the rev counter’s scale is displayed with a color background at higher engine speeds. Five segments, and at the end a red segment that indicates the limit of 8,500 rpm. The Audi virtual cockpit also displays a shift light which informs the driver that the engine speed limit has been reached.



Tire temperature and g-meter: the auxiliary gages

The driver can place various gages around the rev counter. Power and torque are shown as percentages. The g-meter, which ranges up to 1.5 g, visualizes the forces that occur while driving through curves, braking or accelerating. A lap timer can record up to 99 laps and evaluate times. As in the race car, the driver also gets information on the status of key technical parameters – the temperatures of the engine oil and transmission fluid and tire air pressures and temperatures.

The multi-media interface (MMI) in the new Audi R8 has an entirely new menu structure. It provides intuitive and easy operation with flat hierarchies. As in a smartphone, intelligent logic replaces branched menu trees, and frequently used functions can be accessed in just a few steps. A special highlight is MMI search, which is available for all basic menus and is operated by user input of free text. It generally generates answers after just a few letters have been input, taking the car's current location into consideration.

Entirely new: the MMI terminal

The MMI terminal on the console of the center tunnel has a completely new design with a highly precise rotary/push-button control. The top surface of the control features the touch-sensitive MMI touch element. It lets the driver input characters as well as scroll and zoom with more than one finger. In front of and behind it are the toggle switches for the most important basic menus, the home button and the back function.

Buttons to the left and right of the rotary/push-button are used to open intelligently linked functional and shortcut menus which supplement many areas of operation. The driver can call up traffic information from the map menu, for instance, or the radio band from the radio menu. In navigation, the driver can save an entered destination in the favorites list or have parking spaces in the vicinity displayed.

Voice control has also undergone significant advanced development. The voice control system understands a large number of everyday expressions. To call a contact that is listed in the phone menu, commands such as "Connect me with Thomas Müller" suffice. The navigation system also responds to natural language inputs ("Where can I find a fuel station?"). This also applies to the basic menus Radio ("Play Radio Galaxy") and Media ("I would like to hear music from my cell phone.").



The driver of the new Audi R8 can also control all MMI system functions from the steering wheel – with the exception of wiping and scrolling gestures. Using the switches and the roller on the left steering wheel spoke, the driver scrolls through the menus for the on-board computer, audio system, phone and navigation. On the right side of the steering wheel are the volume control, voice control button, express phone button and a user-configurable favorites button.

Infotainment and Audi connect

Audi delivers the Audi R8* with the top-version of the MMI as standard equipment – MMI navigation plus with MMI touch. As versatile media centers, they integrate two SD card readers, the Audi Music Interface (AMI), a DVD drive, aux-in port and Bluetooth interface for voice control and audio streaming. The range of features is complemented by a 10-GB flash memory for music data, the Audi sound system with five loudspeakers, and a speed limit indicator that is based on data of the navigation map.

MMI navigation plus offers access to the voice control of a coupled smartphone. It shows the cell phone's incoming emails and text messages and reads them aloud. Another attractive service is online updates for the navigation map – they are made available every six months, and the first five are free-of-charge. The standard seat belt microphones for the driver and front passenger are used for telephoning and voice control of the MMI. Three small microphones are integrated into the belts for top quality sound.

MMI navigation plus with MMI touch draws upon the computing power of the Audi modular infotainment platform (MIB). In its second generation, which is being used in the new R8, it utilizes the Tegra 30 processor from NVIDIA. The Tegra chip in the MIB works together with its counterpart in the Audi virtual cockpit at computing cycles at speeds of thousandths of a second.

Always online: Audi connect

An ideal complement to MMI navigation plus is the Audi connect hardware module that is being offered in the Audi R8 for the first time. This module produces a connection to the internet – whenever possible via the fast LTE data transmission standard. The passenger can surf and e-mail freely on a smartphone or tablet using the integrated Wi-Fi hotspot, while the driver benefits from customized online Audi connect services that are delivered to the car.



The line-up of Audi connect services ranges from navigation with Google Earth and Google Street View to online media streaming and real-time traffic information. The driver can adapt many of these services to personal needs through a myAudi account. In addition, the Audi MMI connect app provides direct networking between the car and smartphone.

Attractive solutions round out the infotainment options. They include a tuner for digital radio reception and the Audi phone box, for a wireless interface between the cell phone and the car's antenna. The Bang & Olufsen Sound System will appeal to hi-fi customers with high audiophile standards. Its 550-watt amplifier drives 13 loudspeakers; a subwoofer is mounted to the bulkhead at the right front wheel housing. The woofers are mounted in the doors with anodized aluminum trim brackets. When it is dark, they are illuminated by LED accent lighting.

Equipment

Ordering for the new Audi R8* began on May 13, 2015, and the car will be launched in the third quarter in Germany and other European countries. The R8 V10 costs 165,000 euros, and the "plus" model is priced at 187,400 euros.

Its equipment features are extremely extensive – the drivetrain and chassis equipment in particular underscore the dynamic character of the high-performance sports car. Engine power is transmitted to the wheels via a seven-speed S tronic and a quattro permanent all-wheel drive system with torque vectoring. The car comes with factory installed 19-inch wheels or optional 20-inch wheels.

The standard equipment package is rounded out by the Audi drive select system with its four basic modes, the performance program for dry, wet or snow conditions (standard on the V10 plus, optional on the V10) and the multicollision brake assist system. Dynamic steering and Audi magnetic ride damper control are available as options.

The numerous exterior features clearly express the power of the high-performance sports car. LED headlights and dynamic rear turn signals are standard, and laser spots for the high-beam headlights are available as an option together with dynamic front turn signals.





Add-on parts of the R8 V10 plus such as sideblades are made of CFRP. The engine compartment hood can also be delivered in this material. The body colors are new and may be combined freely with the color of the sideblades. In addition, quattro GmbH offers customized paint finishes as part of its Audi exclusive program.

The operating concept of the new high-performance sports car is strictly tailored to the driver. The fully digital Audi virtual cockpit can be controlled from the R8 sport leather steering wheel with multifunction plus and two satellite buttons (on the R8 V10) or the R8 performance leather steering wheel with multifunction plus and four satellite buttons (standard on the R8 V10 plus, optional on the R8 V10).

MMI navigation plus with MMI touch is also standard equipment, and a high-quality voice control system rounds out its operating logic. Its sound is played back over the Audi sound system. Optional equipment for rounding out the infotainment system includes the Audi connect module, a digital audio tuner, the Audi phone box and the Bang & Olufsen Sound System.

The driver and passenger sit on sport seats that are heated and feature partial power adjustment (standard on the R8 V10, optional on the R8 V10 plus) or bucket seats (standard on the R8 V10 plus, optional on the R8 V10). They may be upholstered in a leather/Alcantara mix or with fine Nappa leather. Audi makes numerous options available to individualists, including various leather interiors and packages, seat upholstery with diamond pattern and CFRP inlays. In the interior in particular, quattro GmbH is able to satisfy even unusual wishes as part of its Audi exclusive customization program.

Other standard features underscore the dynamically luxurious character of the new R8 – deluxe automatic air conditioning, anti-theft warning system, LED interior lighting, convenience key, park assist plus and cruise control. As options, Audi can deliver an interior lighting package, high-beam assist, a storage package and a reversing camera. Passive safety features of the new R8 include two front airbags, two head airbags and two thorax side airbags as well as the integral head restraint system.



Production

The new Audi R8 is manufactured under the auspices of quattro GmbH, a 100-percent subsidiary of AUDI AG at its “Audi Böllinger Höfe” production facilities in Heilbronn. The AUDI AG investment in its facility in the immediate vicinity of its tradition-rich Neckarsulm production site amounts to a figure in the double-digit millions.

As many as 500 highly qualified employees work in the body manufacturing and assembly areas at the production site which has 30,000 m² (322,917 sq ft) of production floor area. Just as for the previous model, production is organized as a flexible handcrafting process. quattro GmbH is further extending its production competence in limited production runs here. In body manufacturing, the initial focus is on the aluminum parts of the ASF. In a first step, specialists weld together the front body module, middle floor and rear body module – which are made of cast aluminum and extruded aluminum profiles – and they then join the three modules to the underbody. Robots perform joining processes that involve cold joints such as rivets and screws, while workers execute welding tasks. The body continues to grow with the addition of the greenhouse (the area of the glass surfaces) and the roof. Humans and robots work closely together in installing the CFRP parts.

High-tech transport: self-propelled assembly skids

The finished body is transferred to the assembly area on a self-propelled assembly skid, which is known as a driverless transport system (DTS). The DTS, an innovation at Audi, utilizes high-power storage capacitors as its energy storage medium, and it navigates through the production floor areas via laser scanner and RFID (Radio Frequency Identification) chips. In the assembly area, which is laid out as a U-shaped chain, employees perform a large share of the handcraft work in 15 cycles each lasting around 30 minutes.

Flexibility enjoys an extremely high priority at “Audi Böllinger Höfe” – in body manufacturing employees also produce derivatives such as the R8 LMS race car in parallel to the production cars. The assembly area is also configured for quick modifications. The cars move through many areas of the hall on the DTS. There are no overhead conveyors or a classic “marriage” station. The drive unit and suspensions are preassembled and installed separately from one another.



The latest ergonomic standards apply to assembly of the new Audi R8. The DTS skids can be variably adjusted up to 1.2 meters (3.9 ft) in height. The brake and coolant lines are laid out in the underbody on a lifting/pivoting platform that rotates the car 90 degrees

Initial operation of the newly produced R8 is performed at the testing center and comprises six separate cycles. Afterwards, each new R8 must successfully complete a stringent quality approval process on the plant's own test track. After this, an approximately one-hour test drive is conducted on public roads which also includes freeway driving. Only then is the new sports car released for delivery to the customer.

The Audi R8 e-tron

340 kW of power, a 0 to 100 km/h (62.1 mph) sprint time of 3.9 seconds and a driving range of up to 450 km (279.6 mi) – Audi has further developed the R8 e-tron*, an electric high-performance sports car comprehensively. The high-performance sports car combines its purely electric high-performance drive system with radical solutions in lightweight design.

Visually, the 4.40 meter (14.4 ft) long Audi R8 e-tron can be made out by the unique lighting solutions on its air inlets, front apron and sideblades. The car's exterior skin, painted in magnetic blue, combines body parts made of aluminum and CFRP – such as the front and rear lids. Thanks to aerodynamic modifications – to the cooling air inlet, rear spoiler, diffuser, underbody and sideblades, for instance – the drag coefficient (c_D) of the R8 e-tron is just 0.28. Its Audi Space Frame (ASF) is based on the multimaterial design of the V10 version, which has been extended by a rear body module made of CFRP. Despite its low weight, the corrugated walls that form the luggage compartment can absorb an extreme amount of energy in a rear-end collision.

The T-shaped battery is structurally integrated in the center tunnel and is mounted behind the occupant cell – this location offers a low center of gravity and an axle load distribution of 40:60 (front/rear). The high-voltage battery, which Audi manufactures itself at its battery technology center, is based on lithium-ion technology. The liquid-cooled battery consists of 52 modules. Compared to the first e-tron technology demonstrator, the energy capacity of the approximately 600 kg (1,322.8 lb) battery system was increased from around 48.6 to 90.3 kWh – without any modifications to the package.



Thanks to its high energy density, which was increased from 84 to 152 Wh/kg, the R8 e-tron can be driven up to 450 km (279.6 mi) on a single battery charge – its previous range was 215 km (133.6 mi). In the Combined Charging System (CCS) for charging with DC or AC electricity, the battery can be fully charged in well under two hours. The driver can control this process remotely by smartphone, provided that the relevant Audi connect app has been installed on it.

Immense tractive power: 920 Nm (678.6 lb-ft) of torque

The two electric motors on the rear axle each output 170 kW and 460 Nm (339.3 lb-ft) of torque. The R8 e-tron, which weighs just 1,841 kg (4058.7 lb) empty (without driver), sprints from 0 to 100 km/h (62.1 mph) in 3.9 seconds and can accelerate to an electronically governed top speed of 250 km/h (155.3 mph) while developing its unique e-sound. Targeted torque vectoring – a need-based distribution of drive power between the rear wheels – gives the car excellent stability and dynamism.

Intelligent energy management and an electromechanical brake system at the rear axle ensure high rates of energy recuperation. The suspension springs consist of glass-fiber-reinforced polymer (GFRP), and the anti-roll bar is made of CFRP.

The R8 e-tron rides on aerodynamically optimized, 19-inch aero wheels with a gloss turned finish that were specially designed for this car. Size 225/40 R19 tires on the front wheels enable precise steering response. On the rear wheels, the high torque of the electric motors is transferred to the road by size 275/40 R19 tires. Specially developed to meet the needs of the high-performance electric sports car, the tires combine sporty driving properties with low rolling resistance. Sporty 20-inch wheels for the production R8 are available through the Audi Genuine Accessories program.

In the finely crafted interior, the R8 e-tron offers illuminated door sill trims, folding bucket seats and a specially configured Audi virtual cockpit. A heat pump removes waste heat from electrical components for thermal management and for interior climate control – an important efficiency module of the overall concept.



Audi is also utilizing the new development stage of the R8 e-tron as a mobile high-tech laboratory. Here, it plays an important role in developing concepts and components for electric mobility of the future. Interested customers will be able to order the car later this year, and it will be produced in handcrafted quality at the Audi “Böllinger Höfe” production site.

The new Audi R8 LMS

Making its debut at the same time as the new R8* production car model is the new edition of the Audi R8 LMS – a GT3 race car. Specialists from motorsport and production collaborated closely in its development. As in the first generation, the share of common parts is just under 50 percent, and both cars have made significant performance gains. The body of the R8 LMS is manufactured together with the production model at “Audi Böllinger Höfe”.

The body of the GT3 race car is based on the point-reinforced multimaterial ASF that is made of aluminum and CFRP. It is supplemented by a safety cage that is assembled before the body gets its roof. The Audi safety seat, known as the PS1, is solidly joined to the chassis, which increases rigidity. The steering column and pedals can be adjusted. A new type of CFRP element in the rear body protects the driver in case of a rear collision. With the exception of the roof, the exterior skin consists of CFRP, and the homologation weight of the rear-wheel drive race car is 1,225 kg (2,700.7 lb).

The race car’s V10 engine is nearly identical to the production car engine; it only omits the manifold fuel injection. Its power output is around 430 kW (approx. 585 hp) – depending on the specific race regulations and the air restrictor that is specified in them. Audi is planning on 20,000 km (12,427.4 mi) as the engine rebuild interval. The newly designed six-speed transmission, which is pneumatically shifted via paddle shifters, is around 20 kg (44.1 lb) lighter than the previous unit; the clutch features electrohydraulic activation. Classic, lightweight race car wishbones guide the wheels, which are 18 inches in size according to race rules. The race car also uses special steering components and wheel bearings.



Special strength: aerodynamic efficiency

One of the top qualities of the new Audi R8 LMS, which is 4.58 meters (*15.0 ft*) long and 1.17 meters (*3.8 ft*) high, is its aerodynamic efficiency. The large diffuser in the underbody – that is covered by large smooth panels – generates strong downforce, which enables a smaller rear wing. Compared to the previous model, the aerodynamic drag coefficient has been lowered by 20 percent. The flow of cooling air has been improved in all areas – in the front body and in the cockpit.

Today, the new Audi R8 LMS already conforms to GT3 race regulations that take effect in 2016. Just ten weeks after its world premiere at the Geneva Motor Show, the R8 LMS claimed victory at the Nürburgring – making a dazzling entrance on the 24 hour racing scene.

– Fin –

En 2014, AUDI AG a livré environ 1 741 100 automobiles à ses clients. Le constructeur a atteint un chiffre d'affaires de 49,9 milliards d'€ et un résultat d'exploitation de 5,03 milliards d'€. Il est représenté sur plus de 100 marchés dans le monde entier et produit aux sites d'Ingolstadt et de Neckarsulm (Allemagne), de Győr (Hongrie), de Bruxelles (Belgique), de Bratislava (Slovaquie), de Martorell (Espagne), de Kaluga (Russie) et de Jakarta (Indonésie). Les usines de Changchun, Foshan et Aurangabad assemblent des voitures uniquement pour les marchés locaux. En 2015, Audi démarrera la production à São José dos Pinhais (Brésil), puis San José Chiapa (Mexique) en 2016. AUDI AG possède plusieurs filiales à 100% dont quattro GmbH (Neckarsulm), Automobili Lamborghini S.p.A. (Sant'Agata Bolognese/Italie) et Ducati Motor Holding S.p.A. (Bologne/Italie).

AUDI AG emploie quelque 80 000 personnes dans le monde entier, dont environ 55 800 en Allemagne. Entre 2015 et 2019, AUDI AG projette d'investir 24 milliards d'euros au total, surtout dans de nouveaux produits et les technologies durables. Audi assume sa responsabilité en tant qu'entreprise et a fait de la durabilité des processus et des produits un objectif stratégique. L'objectif à long terme est la mobilité à bilan carbone neutre.

En 2014, Audi a enregistré 57 214 immatriculations en France.

En cette année 2015, Audi France célèbre la 9^{ème} édition des Audi talents awards, programme d'engagement sociétal dont la vocation est de faire émerger et accompagner les jeunes talents dans les domaines de l'art contemporain, du design, du court métrage et de la musique à l'image. Illustration de l'avant-gardisme, valeur fondamentale de l'entreprise, cette initiative aujourd'hui reconnue dans le paysage culturel français se démarque par des programmes d'accompagnement des lauréats toujours plus performants.

Acteur majeur des grandes courses automobiles avec l'Audi RS 5 DTM et l'Audi R18 TDI e-tron quattro, partenaire officiel des Fédérations Internationale et Française de Ski, Audi s'engage en compétition pour éprouver les dernières innovations technologiques.