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The 2009 Audi R8: The Genes of a Winner

HERNDON, Va. — Audi has used the name and the genes of a five-time Le Mans winner, the Audi R8 prototype race car, and turned it into a spectacular production sports car. Three years after unveiling the Audi Le Mans quattro concept car, the production version debuted at the 2006 Paris Motor Show as the new Audi R8 mid-engine sports model. It is a fascinating driving machine and the sporty pinnacle of the Audi brand. The mid-mounted 420 hp V8 FSI engine, quattro[®] all-wheel drive and Audi Space Frame[®] aluminum body form the basis for truly outstanding driving dynamics.

As the first Audi mid-engine sports car, the R8 combines Audi's experience gained from numerous motorsport triumphs with groundbreaking design and the acknowledged technological expertise of the brand. This expertise has led to the slogan 'Vorsprung durch Technik,' or advancement through technology, becoming a byword for leading-edge technology both on the race track and on the road.

Audi has recorded countless motorsport victories on race tracks all over the world. Following the rally successes of the Ingolstadt brand in the 1980s, and its triumphs on the touring car circuit, matching the feats of long-distance motor racing cars undoubtedly was the biggest challenge yet faced by Audi's motorsport engineers. Nonetheless, they mastered this

challenge in style with the Audi R8 prototype, which won the prestigious Le Mans 24 Hours five times – from 2000 to 2002 and in 2004 and 2005 – and on two occasions even took the first three places.

Le Mans is without doubt the toughest challenge to the Audi Sport Team's engineers because it calls for a level of engineering going far beyond the need merely to keep all the systems focused on a short, sharp sprint. Alongside the essential virtues of top performance and optimized driving dynamics, the key requirements in long-distance racing are endurance and reliability, allied with optimum ergonomic design.

These are genes that eminently are transferable to a road-going sports car and which, along with its exciting design, make the Audi R8 truly unmistakable.

The exterior

Even at first glance, the caliber of the car is plain to see. The Audi R8 sits wide and low on the road, with its strongly accentuated rear end appearing to flex its muscles like a sprinter ready to leave the starting block.

The characteristic proportions of the vehicle are dictated by the location of the engine behind the cockpit, where it's also found in race cars. One of the most striking examples of this design – and as such one of the legitimate antecedents of the Audi R8 – is the Auto Union Type C Grand Prix car. The central position of the engine is a boon to driving dynamics, with a weight distribution, as on the R8, of 44 percent to the front and 56 percent to the rear.

The R8's body is highly compact in appearance. The front end and the gently curved roof arc are drawn in a sweeping line that immediately marks the two-seater as an Audi.

The side view also reveals familiar contours. The dynamic line above the wheel arches and the shoulder line interlink the front end, side and rear, imbue the doors and the transition to the side air vent with a strong presence, and even more emphatically highlight the typical Audi rounded wheel housings that accommodate the big wheels.

The cabin of the Audi R8 is pushed far forward – typical of a mid-engine sports car and a visual cue of the R8 race car. Behind the cabin, positioned in front of the rear axle, is the V8 FSI engine, a sculptured piece of engineering visible both through the large, shield-shaped rear window and from inside the car.

Seventy-five inches wide but just 174.5 inches long and 49.3 inches high: these are the proportions of a true sports car. The 104.3-inch wheelbase offers room for the astonishingly spacious cabin and the longitudinally-mounted engine behind it. Behind the doors, a large-surface 'sideblade' air deflector sweeps between the wheel arch and the roof section, delivering air for the V8 to breathe as well as for cooling. The paint finish of the sideblades is contrasted with the body color, or it can be ordered to match the body color.

The front end is characterized by the trapezoidal styling of the Audi single-frame grille, flanked on the right and left by additional large-dimensioned air intakes. For the first time, the Audi four-ring badge is positioned on the hood, above the grille. The LED daytime running lights, with their clear-glass covers, join flush to the tops of the air intakes.

The interplay of concave and convex lines contours the side-on view of the rear end. Underneath the clearly defined separation edge there is a flat vertical surface framed at its sides by the rear lights that feature LED technology. The third brake light strip runs across the roof, forming the termination of the transparent engine hood.

The latter feature is yet another visual highlight. The observer looks right onto the V8 engine, the very heart of this sports car. Engine compartment lighting by white LEDs that permit the engine to be seen, even in the dark, is standard.

Two large-format diffuser openings in the rear bumper illustrate how the R8's styling is dictated by aerodynamics. The two pairs of circular twin exhaust tailpipes sit at the right and left above the diffuser openings.

The rear spoiler deploys automatically. It provides additional downforce to boost the suction effect produced by the aerodynamic design of the underbody and by the diffusers. When traveling at lower speeds, the R8's rear spoiler automatically retracts flush with the body. It also can be operated manually with a push button located in the driver's cockpit.

The full aluminum body uses the Audi Space Frame (ASF) design. Its perfect synthesis of minimal weight and maximum rigidity provides the ideal foundation for optimum driving dynamics and an outstanding weight-to-power ratio of just 8.6 lbs/hp.

The interior

The sporty interior is dominated by a driver-oriented cockpit architecture called "Monoposto" that positions the driver between the dashboard and the high center console. The instrument panel above the console is angled slightly towards the driver. The flat-bottomed steering wheel is a typical feature of the sportiest Audi models, and it also enables comfortable sports car entry and exit.

Form follows function throughout the R8. The driver-oriented architecture also is reflected in the styling of the side window sills, and the choice of materials provides a highly functional look and feel. The styling and placement of all elements in the cockpit of this driving machine mimic the R8 race car. They are focused on the essentials that make the driver the center point.

The combination of aesthetics and ergonomic considerations is maintained in the colors used and the overall ambience they create. Dark hues reflect the emphasis on engineering and are again reminiscent of the motorsport world. Professional functionality and ergonomic styling are enhanced by the visible presence of top-quality materials and exceptional craftsmanship.

The sports seats are trimmed as standard in a sporty Leather/Alcantara combination or optionally in full Fine Nappa leather. There is plenty of room for two occupants, with comfort levels well beyond the norm of high-performance sports cars. There is space behind the

seats to stow large bags, or even two golf bags. The luggage compartment at the front has a capacity of approximately 3.5 cu. ft.

The drivetrain

Turbine-like power that extends to the highest rev ranges and high maximum torque – all combined with a fascinating sound – are the characteristics of a perfect sports car engine: an engine that is fascinating both in terms of its enormous power potential and its suitability for everyday use.

In the high-revving 420 hp eight-cylinder engine, the evolution of FSI gasoline direct injection technology has reached new heights. This is the same technology that also has enjoyed many triumphs in the Audi R8 race car.

These figures illustrate the outstanding potential of the eight-cylinder unit: at 7,800 rpm the 4.2-liter engine delivers 420 hp of power output; peak torque is 317 ft. lbs. from 4,500 to 6,000 rpm; no less than 90 percent of this maximum torque is maintained consistently throughout a wide range of engine speeds from 3,500 to 7,600 rpm. As a result of these qualities, the eight-cylinder power unit provides maximum thrust in virtually any driving situation.

The performance figures are equally impressive: the R8 accelerates from a standstill to 60 mph in 4.4 seconds and reaches a top speed of 187 mph.

The engine is a high-revving unit with a maximum engine speed of 8,250 rpm. The results are superior power output at high engine speeds and a smooth responsiveness across the revs range. Added to this are the R8's agility, liveliness and engine sound, which are similar to that of a race car.

The R8's dry sump lubrication – another technology that flows directly from motor racing – provides the ideal basis for maximum longitudinal and lateral acceleration. It allows the V8 to be positioned lower, thereby lowering the center of gravity and further enhancing driving dynamics.

Two transmissions are available: a manual six-speed gearbox or the Audi R tronic sequential-shift gearbox. Here, too, the influence of the motorsport world clearly is evident, with a joystick gear-shift on the center console and the paddles mounted on the steering wheel, which are long-established ergonomic features in motorsport. Once again, the best illustration of this is the Le Mans-winning Audi R8, which also enables the driver to change gears from the steering wheel.

'Shift by wire' technology provides for very fast gear-shifting and an outstanding power-to-weight ratio, allied to compact gearbox dimensions. The Sport mode, with its fast shifting, guarantees the absolute maximum in terms of driving fun. An automatic mode also can be selected.

Such a powerful Audi is, of course, fitted with quattro all-wheel drive, which distributes the power variably to the front and rear axles by way of a viscous clutch. On the Audi R8, the legendary quattro system is adapted to the axle load distribution typical of mid-engine cars.

The chassis

The chassis features forged aluminum double wishbones at the front and rear. At the front they are triangulated, while at the rear the top one is triangulated and the bottom one is a triangulated wishbone with a track rod. This provides for optimum wheel control, and it is a geometry that has proven itself to be the ideal solution for delivering agility, maximum steering precision and precisely defined self-steering characteristics.

Direct, hydraulic rack-and-pinion steering provides optimum feedback to assist the driver with speed adaptive power assistance.

The spring and damper setup is stiff in order to deliver maximum driving dynamics, while still providing an astonishing level of ride comfort. This is particularly true with the 'Audi magnetic ride' adaptive damper system that is standard on the R8. The shock absorbers employ an innovative technology. Instead of conventional damper fluid, they use a magnetorheological fluid. This is a fluid whose viscosity can be influenced by an

electromagnetic field, thereby enabling the damping characteristic to be influenced electronically at will and instantaneously by applying a voltage to the electromagnets.

Audi magnetic ride uses this property to deliver the correct damping forces in every driving situation, thus optimizing ride comfort and driving dynamics. A computer equipped with sensor technology determines the prevailing driving situation in a matter of milliseconds. Drivers can choose between "Normal" or "Sport" modes, depending on whether they want to drive in a highly sporty style – with the magnetorheological fluid adjusted to a low viscosity – or with the emphasis more on ride comfort.

The Audi R8 is fitted with split five-spoke 19-inch alloy wheels. The 235/35 size performance tires at the front and 295/30 tires at the rear provide the necessary road-holding. This tire configuration also ensures that this mid-engine sports car always is able to translate the dynamism of its drivetrain and chassis into optimum grip and maximum lateral dynamics.

The mid-engine sports car's long wheelbase and extremely low center of gravity ensure that it always retains maximum stability, resulting in superb agility, finely tuned responsiveness to any driver input, and high levels of safety.

Equipment and trim

Even the standard equipment of the Audi R8 meets the high demands of customers in this segment. Xenon plus headlights, LED rear lights and daytime running lights, 19-inch aluminum wheels, an audio system with 6.5-inch monitor, Sirius® satellite radio, anti-theft alarm and Leather/Alcantara interior trim are just some of the items on the extensive list of standard features.

The range of optional extras leaves virtually nothing to be desired. A Bang & Olufsen sound system, featuring an output of 465 watts and 12 specially-designed speakers, delivers surround sound of the highest standard. A microphone-based vehicle noise compensation system adjusts audio levels to changing road conditions and speeds. A full leather upgrade is available to cover the seats, doors, and dash with premium Nappa leather.

Owners looking to further distinguish their R8 can order Carbon Fiber Sigma, Oxygen Silver or matching body-color sideblades.

The acoustic parking system and a rear-view camera help the driver to maneuver into even the tightest of spaces. The radio/navigation system plus, featuring a large-format color monitor and MMI keypad, combines extensive functionality with extreme user-friendliness.

A range of coordinated and ideally combinable design and leather trim packages from Audi and from quattro GmbH can turn any R8 into the customer's personal dream car. These include available Carbon Fiber Sigma interior inlays and engine compartment inlays, along with Fine Nappa Leather.

Six exterior colors are available, ranging from Ibis White to Phantom Black, pearl effect.

Craftsmanship

The Audi R8 is being hand-assembled on a small-lot production line in a specially constructed new block at the Audi plant in Neckarsulm. The entire production process – from bodyshell construction to final assembly – is organized in the same way as a craft workshop. Small teams of specialists accompany every step of production, subjecting every part and component to intense scrutiny. This ensures that every one of a maximum of 25 cars built per day will more than match the customary high quality standards of the Audi product range.

Warranty

The Audi A3 will be backed by a new vehicle limited warranty that includes:

- Four-year/50,000 mile limited new vehicle warranty
- 12-year limited warranty against corrosion perforation
- 24-hour Roadside Assistance for four years

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