

AUDI AG  
Product and Technology Communications  
85045 Ingolstadt,  
Germany  
Tel: +49 (0)841 89-32100  
Fax: +49 (0)841 89-32817

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## The Audi A6 Avant – elegance & high-tech

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Annex: Technical Data

**The equipment and data specified in this document refer to the model range offered in Germany. Subject to change without notice; errors and omissions excepted.**

## Summary

### **The new Audi A6 Avant: success model and trendsetter**

**Audi is once again leading the way – the new A6 Avant is the trendsetter in the business class. With its lightweight body and many other innovations, the sporty and comfortable Avant will continue the success story of the model line in what is now the sixth generation.**

Even at a glance, the elegant, 4.93 meter (*16.17 feet*) long Audi A6 Avant gives an impression of great agility. Its proportions are sporty and elegant, with the low roof line terminating in the flat D-pillars. On request, Audi supplies the headlights and rear lights as LEDs, which are fascinating both in visual and technological terms; the powerful adaptive light is available for the xenon plus headlights.

The new Audi A6 Avant sets standards with its low weight. With aluminum components comprising roughly 20 percent of the body, Audi – the global pioneer in lightweight construction – has raised the bar once again. Gross weight has been reduced by as much as 70 kilograms (*154.32 lb*) compared with the previous model. The A6 Avant 2.0 TDI, for example, has a curb weight of just 1,640 kilograms (*3,615.58 lb*).

The interior is a sight to behold, with its sleek design, superb workmanship, generous array of equipment and exemplary ergonomics. The high-end options include a head-up display, ventilated front seats with a massage feature and an extensive selection of infotainment elements. Topping the range of infotainment options are the hard drive-based navigation system MMI navigation plus and the Bang & Olufsen Advanced Sound System.

Audi connect, a fully fledged Internet connection, also places the new Audi A6 Avant at the head of the pack. In partnership with Google, it brings special online services to the car, including a voice-controlled point of interest (POI) search. A Wi-Fi hotspot allows passengers to surf and email freely while on the road.

Another innovation, the Audi online traffic information service, accurately informs the driver in real time about possible traffic congestion on the selected route.

The brand's high-tech assistance and safety systems lend even more confidence to driving. Some of these systems work closely together with MMI navigation plus, further enhancing their capabilities. New in the Audi line is the parking system plus with a 360° camera: this features four tiny cameras recording images of the immediate vicinity of the vehicle. The surroundings are displayed on the large on-board monitor in different views.

The luggage compartment of the new A6 Avant has a capacity of 565 liters (*19.95 cubic ft*), which can be increased to 1,680 liters (*59.33 cubic ft*) by folding down the rear seat backs. Audi also offers a wide range of other practical and refined features. They include the sensor-controlled, automatically opening tailgate: When the driver executes a valid pattern of movement underneath the rear bumper while standing at the rear, contactless sensors cause the tailgate to open.

Audi offers a choice of five engines with direct fuel injection for the new A6 Avant: two gasoline engines and three TDI units. These generate an output of between 130 kW (177 hp) and 220 kW (300 hp). They will be followed somewhat later by a biturbo 3.0 TDI with an output of 230 kW (313 hp). All of these power units combine power with pioneering efficiency – the fuel consumption has decreased by as much as 21 percent compared with their predecessors. The 2.0 TDI, for example, manages with only 5.0 liters of fuel per 100 km (*47.04 US mpg*) on average. All units employ the technologies from Audi's modular efficiency platform.

Depending on the engine version, Audi gives the new A6 Avant different power transmissions – a 6-speed manual transmission, the continuously variable multitronic, the 8-stage tiptronic, optimized for fast gear shifting, or the sporty 7-speed S tronic. Besides the front-wheel drive the quattro permanent all-wheel drive stands ready. The optional sport differential flexibly distributes the power between the rear wheels.

The elaborate chassis combines sporty dynamics and luxurious comfort. The Audi drive select dynamic system, together with the efficiency mode, is standard on all turbocharged engines; the new electromechanical power steering operates with outstanding efficiency. In the front-wheel-drive variants, the ESP electronic stabilization program featuring an electronic limited slip differential makes the car's handling even more precise. Options from Audi include adaptive air suspension and dynamic steering, with the latter to become available somewhat later.

The Audi A6 Avant will be available for sale in June 2011 at a base price of 40,850 euros.

## At a glance

### **The new Audi A6 Avant**

#### **Body**

- Length 4.93 meters (*16.17 ft*), wheelbase 2.91 meters (*9.55 ft*)
- Innovative body concept, many components made of aluminum
- Xenon plus and LED headlights as well as adaptive light option
- Variable cargo space from 565 to 1,680 liters (*19.95 to 59.33 cubic ft*), on request automatically opening tailgate with sensor control as well as electrical luggage compartment cover

#### **Interior**

- Spacious interior with ultra-comfortable character
- Generous standard equipment, wide array of options from the luxury class
- Head-up display, ambient lighting and front seats with ventilation and massage feature available on request<sub>s</sub>

#### **Drivetrain**

- At launch: two gasoline engines and three TDI units, all with direct injection
- 2.0 TDI with 130 kW (177 hp), average fuel consumption only 5.0 liters per 100 km (*47.04 US mpg*)
- A new, sporty biturbo 3.0 TDI generating 230 kW (313 hp) to follow somewhat later
- Manual transmission, multitronic, tiptronic and S tronic for the power transmission
- V6 engine standard or optionally with quattro drive
- quattro drive with self-locking center differential and torque vectoring, optional sport differential

#### **Chassis**

- New electromechanical power steering, dynamic steering on request
- Audi drive select dynamic system with new efficiency mode standard for all turbocharged engines
- Optional adaptive air suspension with controlled damping
- ESP with electronic limited slip differential for the models with front-wheel drive
- Elaborate suspension, powerful brakes, wheels up to 20 inches in diameter

**Assistance and infotainment systems**

- Advanced safety and assistance systems such as Audi pre sense, adaptive cruise control with stop & go function, Audi active lane assist, Audi side assist, night vision assistant, speed limit display and park assist system with 360° camera
- MMI navigation plus with MMI touch and 8-inch display on request
- Optional Bang & Olufsen Advanced Sound System with 15 speakers
- Full-fledged Internet connection, new online and traffic information services

Full version

## **Progressive technological expertise – The new Audi A6 Avant**

**Audi is launching the next generation of the A6 Avant, the most successful business-class station wagon in Europe. The new model presents the brand's full array of progressive technological expertise. Its lightweight body, large portions of which are made of aluminum, sets new standards, as does the broad selection of assistance and multimedia systems and Internet connection, the keyword for which is Audi connect.**

**The new Audi A6 Avant comes to the market with five engines: two gasoline and three diesel units. Fuel consumption has been reduced by as much as 21 percent compared with the previous model. The line is headed by the new biturbo 3.0 TDI with an output of 230 kW (313 hp), which will appear somewhat later. The most efficient engine is the 2.0 TDI, consuming only 5.0 liters of fuel per 100 km (*47.04 US mpg*) on average.**

**Audi also offers numerous high-end options for the drivetrain and the chassis. The luggage compartment has a capacity of up to 1,680 liters (*59.33 cu ft*) and offers a number of elegant features, including a power rear hatch that opens in response to a sensor signal.**

### **Exterior design**

The new Audi A6 Avant is distinctly sporty and sleek – with harmonious proportions, elegant styling and a low-lying glass cabin with flat D-pillars. Its exterior presents the aesthetics of the technology in all its details, in the sharp course of the lines and in the athletic tension of the surfaces. Good-looking station wagons have always gone by the name of Avant – ever since the first such model 34 years ago.

The exterior dimensions of the new A6 Avant are nearly identical to those of its predecessor. The wheelbase has grown by nearly seven centimeters (*2.76 inches*), however, while the front overhang has been shortened by a good 8 centimeters (*3.15 in*).

The new Audi A6 Avant is 4.93 meters (16.17 ft) long and has a wheelbase of 2.91 meters (9.55 ft). Its width measures 1.87 meters (6.14 ft) and its height 1.46 meters (4.79 ft) – the sportiest proportions among the competition.

The large, low-lying single-frame grille with the beveled upper corners dominates the front view, and forms an organic part of the sculptured front end. Its grille features a high-gloss black paint finish, and the horizontal orientation of the lamellae underscores the breadth of the vehicle, as do the wide, low-lying air inlets.

The wedge-shaped headlights increasingly broaden towards the outside. The engine hood cuts into their upper edges, giving the new A6 Avant a resolute, energetic look. The bottom edges of the headlights form a wave-shaped contour.

### **Confident elegance: sides and rear**

The profile of the new Audi A6 Avant also conveys an impression of confident elegance. The ratio of body panel surfaces to the windows is two-thirds to one-third – a typical Audi proportion. The roof line already begins to descend slightly behind the B-pillar, while the third side window is cut very low. The powerful D-pillars and the rear window are unusually flat – a classic characteristic of the Avant.

Sharp edges at the body embrace powerfully arched surfaces. The tornado line, the dominant design element of the A6 Avant, defines the proportions; as a pronounced shadow edge it lends strong shoulders to the body. The line begins at the headlights and sweeps in a slight arch over the fenders, the doors and the rear side parts to the rear lights. The dynamic line, which climbs upward significantly, lies above the side sills.

The glass cabin is accentuated by a high-gloss package with window capping strips made of anodized aluminum and black moldings for the B-pillars. Wheels of 16 to 20 inches in diameter fill the tautly defined wheel arches. The exterior mirror housings contain LED turn signals, while the solid door handles represent dependable safety.



The fine play of the lines terminates in a three-dimensionally shaped rear section. In the lower part, where the license plate is mounted, the section springs back relative to the upper zone. Trapezoidal, split lamps emphasize the width. The matt black diffusor insert embraces the two round tailpipes of the exhaust system.

On request, the S line exterior package gives the A6 Avant an even sportier look. The bumpers and the diffusor insert are more powerfully accentuated; the diffusor, the front air inlet grilles and the center front spoiler edge are painted gray. The tailpipes of the exhaust system are chrome-plated, while the fenders and the sills bear the S line lettering. The sill strips are in the same color as the vehicle body, and a striking roof spoiler integrates the third brake light.

Audi offers a choice of 11 paint finishes for the A6 Avant. The solid colors are called Ibis White and Brilliant Black. The metallic colors are Aviator Blue, Dakota Gray, Ice Silver, Havana Black, Moonlight Blue, Oolong Gray and Quartz Gray. The pearl effect colors Garnet Red and Phantom Black complete the line.

### **Art and prowess: the headlights**

The headlights of the new A6 Avant present the engineers' prowess in the form of works of art – typically for the brand. Audi provides them in three versions. Intense halogen headlights are standard; on request xenon plus headlights and an LED version are available – a technology which puts the brand well ahead of the competition. For the halogen and xenon plus headlights a separate high-beam assistant is available.

The xenon plus headlights include a daytime running light strip consisting of LEDs; it is located at the bottom edge of the headlight, parallel to the wing – the large plastic molding.

The new all-weather light, generated by the intelligent actuation of the light modules in the pointed wedge of the headlight, illuminates a range of 60 meters (197 ft) – four times farther than conventional fog lights, which it also exceeds in energy efficiency. The traditional installation location of the fog lights in the air inlets is occupied in the new A6 Avant by the radar sensors of the optional adaptive cruise control with stop & go function.

Audi also upgrades the xenon plus headlights with the optional adaptive light system, which always provides the appropriate lighting, whether driving in the city, on inter-urban roads or on the highway. The adaptive light includes a dynamic cornering light, a static turning light and variable headlight range control, which detects the light from other vehicles and built-up areas with a small video camera in the base of the interior mirror. By swiveling the light modules the system changes with gentle transitions between low beams and high beams, always affording the driver maximum illumination.

The headlight control unit operates together with the optional MMI navigation plus, and is informed in advance about the data of the selected route. For example, the highway lighting is activated in good time when approaching the highway; the system automatically switches on the cornering light before entering an intersection; and in countries like the United Kingdom, it automatically switches the headlights to driving on the left. On inter-urban roads with dips and crests the active topological compensation improves the driver's own vision and avoids dazzling other drivers.

### **Top solution: the LED headlights**

The top version in the new A6 Avant are the LED headlights. Their white light, created by the transitions of the electrons in the different layers of the semi-conductors, has a color temperature of about 5,500 Kelvin, similar to daylight, which is very pleasant for the eyes at night.

The LED headlights are visually unmistakable, maintenance-free, long-lived and extremely energy-efficient. The low beams consume just 40 watts per unit, which is even less than with the xenon plus technology. Fans and heat sinks modulate headlight temperatures and prevent fogging.

A second, sleek wing structures the interior of the LED headlights. Beneath it are the four single-chip and five double-chip LEDs that generate the low beams. Above the wing are the three quadruple-chip LEDs for the high beams. A separate quadruple-chip LED is responsible for the cornering light.

The LED headlights also include an all-weather light, involving the interplay of several electronic and electromechanical components. In many areas Audi has replaced moving parts by intelligent actuation to achieve flexible illumination of the roadway. In contrast, the highway lighting employs step motors that raise the light/dark boundary from a speed of 110 km/h (68.35 mph) to extend the light cone from 70 to 120 meters (230 to 394 ft). The integrated high-beam assistant automatically switches between the low and high beams.

Along the bottom edges of the headlights the daytime running lights and the indicator lights have been placed in a strip following the large wing. A superposed plastic component provides the thick wall technology that makes them appear as homogeneous strips of light. The daytime running lights are generated by 24 white light-emitting diodes. Blue LEDs – which emit yellow light due to a technical sleight of hand – are responsible for the turn signal lights.

Audi offers LED tail lights in combination with the xenon plus and LED headlights, to create a three-dimensional light pattern. 90 LEDs generate the homogeneous tail lights. Owing to the upstream diffused optics, the tail lights appear as optically consistent, wide arcs. The brake light, centrally placed in the lamps, employs 42 red LEDs. The turn signal light, constructed from 46 yellow LEDs, runs as a band along the upper edge of the lights. The rear fog light as well as the license plate light also uses LEDs. Bulbs generate the reversing lights.

## **Body**

The body of the new Audi A6 Avant leads the competition. The steel/aluminum composite design brings about 15 percent less weight to the scales than a comparable solid-steel design. The body impressively meets all criteria – rigidity, vibration and collision characteristics, aerodynamics and aero-acoustics. Groundbreaking new design methods and materials make these qualities possible.

## Lightweight design: high aluminum content

About 20 percent of the body is made of aluminum, a material with which Audi has experience reaching back to 1994 – when the first A8 rolled off the assembly line – that no other carmaker can match. The high content of this lightweight metal reduces the weight of the body by about 30 kilograms (*66.14 lb*) compared with the predecessor model.

The new composite construction concept with the many aluminum parts in the front end improves the distribution of the axle loads. Above all, however, it provides the basis for the systematic lightweight design pursued by Audi in the A6 Avant – depending on the version, the new Avant weighs up to 70 kilograms (*154.32 lb*) less than its predecessor.

The lightweight body has significant secondary effects – in the case of the suspension and brakes, for example, engineers were able to save many kilograms. The unladen Audi A6 Avant 2.0 TDI (without the driver) weighs in at a mere 1,640 kilograms (*3,615.58 lb*). Audi, the global pioneer in lightweight design, has reversed the spiraling trend in weight once again.

The rear longitudinal member of the A6 Avant is a steel section with welded partitions. The A8 uses an internally ribbed aluminum casting in this area. The properties and appearance of the two components are similar. The steel side sills of the A6 Avant are manufactured in a rolling process and integrated into the structure in a manner similar to that used for the aluminum extruded sections in the A8.

In the A6 Avant, a node assembled from high-strength steel parts serves as the connection between the A-pillar, the side sill and the front cross member. The A8 uses two aluminum die-cast parts here that perform essentially the same functions. As with the luxury sedan, the strut mounts in the front of the A6 Avant are complex, particularly high-precision aluminum castings. The links of the front axle are bolted directly to them; the bearing pedestals commonly used in the past have been eliminated.

The cross members in the engine compartment of the new A6 Avant are also aluminum sections, as are the cross members behind the front and rear bumpers. The integral subframe behind the instrument panel, the cross member in the luggage compartment, the front fenders, the doors and the trunk lid are all aluminum sheet metal, just like the engine hood. A double-lock system keeps these components secure.

The aluminum doors have a double-shell design. For them and the tailgate Audi uses novel diode lasers in the body construction. They operate extremely fast, and consume much less energy than the previously used solid body lasers, reducing CO<sub>2</sub> emissions by about 3,000 tons a year. Twelve of these new lasers make around 50 weld seams per door; a welding group is finished in 75 seconds.

The ultra-precise connection between the side wall frame and the roof, known as the invisible joint, is formed through laser soldering, again involving diode lasers. Audi has invested around 700 million euros in production at the Neckarsulm site, where the new A6 Avant is rolling off the assembly line.

### **Ultra-strong and lightweight: hot-stamped steel**

Another outstanding feature of the new Audi A6 Avant's body is its high-end steel of different strength classes. At the top is hot-stamped steel – heated in a continuous furnace to nearly 1,000°C (1,832°F) and directly afterwards shaped in a water-cooled compression mold at about 200°C (392°F). This extreme jump in temperature creates an iron-carbon structure attaining extreme tensile strength. The hot-stamped components require relatively thin wall thickness and are accordingly lightweight.

The hot-stamped steel lends the highest strength to many areas of the passenger compartment – to the transition between the front end and the passenger cell, to the A-pillars and the curved roof, to the center tunnel, to the side sills and to the transition between the sills and the rear section; in the floor section the steel is used for the cross struts. The B-pillars also consist of this high-end steel; in the lower part they are more flexible than above, since the energy in a side collision has to be absorbed here. This variation is brought about by partly tempering the sheet blanks.

In many zones, such as the cross bracing of the bulkhead, Audi employs tailored blanks – sheets of varying thickness that are thicker and stronger in the areas subject to greater stress. In some cases they are rolled to varying thickness – another high-end method.

### **Comprehensive package: passive safety**

In the new A6 Avant, Audi makes no compromises when it comes to safety. In developing the concept, the brand used, among other things, a knowledge base built up by Audi itself: The AARU (Audi Accident Research Unit) investigates real-world accidents and analyzes the relevant databases. Up to the start of production of the new Avant, a large part of the work occurred on computers – virtual prototypes and components completed more than 4,000 crash simulations.

In a frontal collision, the front cross-member directs the forces to the two longitudinal members, which undergo defined deformation to dissipate these forces. The frame element for the engine and front axle diverts forces and torque in a controlled manner into the strong floor and tunnel structure of the occupant cell. In the footwell, high-strength areas and special foam protect the legs and feet. If necessary, the pedals, made of lightweight materials, are uncoupled from the bulkhead. The steering column absorbs energy without moving into the interior.

Even in a side collision the occupant cell offers the best protection thanks to its hot-stamped steel components. The doors act as stress distributors; their integrated impact absorbers rest on stable surfaces at the pillars. In a rear-end collision the bumper cross members transmit the stress to the large-sized longitudinal member, made of high-strength steel. The tank remains outside the deformation zone in nearly all cases.

### **Graduated action: the adaptive restraint system**

The adaptive restraint system stands guard in the interior of the A6 Avant. It is networked with the Audi pre sense safety system and also uses its own acceleration and pressure sensors. The system manages the cooperation between the front airbags and the belt tension limiters depending on how close to the instrument panel the driver and the front passenger are sitting. The airbags can quickly blow down a portion of their air volume to catch the head and chest more gently; the belt tension limiters can be switched between two stages.

Side airbags in the backrests of the front seats and optionally in the outside rear seats for side collisions are ready in the event of a side impact collision. The seats are very rigid in the transverse directions. The head airbag system opens like a curtain from the A-pillar to the C-pillar. The integrated Audi head restraint system reduces the risk of whiplash injury in rear-end collisions. Isofix fastening clamps for child seats are standard in the rear and optionally available for the front passenger seat.

The new Audi A6 Avant meets all legal requirements for the protection of pedestrians in the event of a collision. The energy-absorbing bumper covering, a foam behind the bumper and an engine hood keeping a large distance from the hard parts play the most important roles here.

Minor collisions, such as the standard insurance category collision, proceed without major financial consequences. The crash boxes made of aluminum extruded sections upstream from the longitudinal members prevent severe damage to the structure. The two optional radar sensors move together with the bumper covering. The new A6 Avant also performs superbly in the RCAR bumper test, focused on the compatibility with the other party in the collision.

### **Outstanding: the rigidity and vibration comfort**

The body of the new Audi A6 Avant is rigid and firm to a high extent. The two torsion rings in the structure – at the B-pillars and around the cutout for the tailgate – make important contributions here. The A6 Avant achieves excellent data in both static and dynamic torsional rigidity.

The high general rigidity together with local optimizations, defined among other things by state-of-the-art simulation methods and the Audi comfort test bench, a unique developmental tool, lead to excellent vibration comfort and to a compact impression of the body. The elaborate hydraulic damping of the axle mounts also greatly contributes to the vibration comfort.

The two engine mounts and the transmission mount (with automatic transmission for versions with quattro drive) in the center tunnel are also hydraulically dampened. In some engine versions the engine mounts are switched electromagnetically. During idling, their soft characteristics keep disturbing noises and vibrations away from the interior; during driving the damping is increased, in order to suppress engine vibrations.

#### **Like the luxury class: noise comfort**

The new Audi A6 Avant conveys the superior acoustic quietness of a luxury-class vehicle. The noise comfort arises from the interplay of numerous progressive aspects, such as the reduced number of bushings in the bulkhead and their consistent sealing.

In many sheet metal areas Audi uses sprayed-on insulating compounds, which are lighter in weight and more effective than the bitumen matting used previously. High-quality non-woven microfiber fabric with insulating properties is used throughout the interior. The underbody paneling also absorbs noise. Even the wheel arch liners integrate special non-woven microfiber fabric.

The glazing of the new A6 Avant also reduces interior noise. Even the standard version – a windshield with a special noise-insulating safety film – has a good insulating effect. Insulated-acoustic glass side windows are also optionally available from Audi. They also have an infrared reflecting coating that reduces heating of the interior from direct sunlight – a unique selling point in the competition. Darkened privacy glazing is alternatively available. The combination of these glazing variants, together with the sealing concept of the doors with the three sealing lines, attains a wind noise level that is competitive even in the luxury class.



## **Drag coefficient of 0.30: the aerodynamics**

The new Audi A6 Avant easily glides through the wind. The basic version's drag coefficient is 0.30, the frontal area measures 2.31 m<sup>2</sup> (24.86 square feet) – the total drag, the product of both factors, is again lower than the predecessor's, itself a very good value.

The A6 Avant hugs the road even at high speeds. The lift is balanced and the lift coefficients at the front and rear axles are low. With the exception of the transmission tunnel, the underbody, the wheels and the wheel arches are fully paneled; the large cover made of glass fiber-reinforced plastic protects the sheet metal and the engine against salt, wet and stone chipping. Wheel spoilers at both axles as well as additional spoiler strips conduct the flow with little loss across the underbody. The latter is aerodynamically optimized and reduces the drag of the A6 Avant by about ten percent.

An optimal and low-loss flow through the engine compartment, which in the worst case can constitute up to 15 percent of the total drag, had high priority in the aerodynamic development. For the air flowing into the single frame grille to reach the radiator without leakage loss, the radiator surrounding has been elaborately sealed off. The plate package and the impellers of the fans are optimized for low flow resistance. The continuously variable brushless electric fan operates at high efficiency.

In developing the A6 Avant, Audi paid great attention to sustainability. The goal was not only to reduce the emissions produced during driving, but also to consider the entire vehicle life-cycle from an environmental perspective. The environmental balance sheet shows that all emissions relevant to the greenhouse effect have significantly decreased relative to the model's predecessor.

While the use of aluminum in the production of the vehicle generates somewhat higher CO<sub>2</sub> emissions, this increase is more than compensated by the lower fuel consumption, also due to the lower weight. The residual aluminum from production from the Audi press shop re-enters the material cycle correctly sorted and without loss in quality – this too reduces CO<sub>2</sub> emissions.

When the vehicle reaches the end of its life, all of the aluminum components can be recycled using just a small amount of energy. The Neckarsulm plant, where the A6 Avant is running off the assembly line, consumes comparatively little energy because of the large-scale utilization of district heating from a neighboring power plant.

## **Interior**

A sleek, light design, combined with outstanding comfort, intuitive ergonomics and highly networked intelligence: The new Audi A6 Avant also documents in the interior its role as a leader in the business class.

The styling of the interior continues the sporty elegance of the exterior. Its dominant element is the large inlay, the wrap-around. Beginning at the driver's door, it runs in large arches under the base of the windshield to the front passenger's door. The instrument panel with its large application surface rounds off the concept of the taut lines with an elegant sweep.

Although the seats are mounted at a sporty, low level, most drivers are surprised by the low-lying engine hood in its entirety – a view reinforcing the impression of great distances and freedom. The broad, asymmetrically cut center console is oriented toward the driver.

## **Uncompromising: the build quality**

Quality knows no compromises – this Audi maxim becomes tangible in the interior of the new Audi A6 Avant. All materials have been selected and processed with the utmost care. The switches can be operated without play, precisely and easily; the joints are uniform and narrow, in some areas only a few tenths of a millimeter wide.

Chromed bezels frame the air vents, and fine aluminum-look strips accentuate the optional fine wood bezels. The rotary controls with their aluminum-look finish are small works of art, while the pushbuttons catch the eye with their black soft-touch finish.

The shifting concept of the automatic operation and the start-stop button feature subtle red backlighting, and the door sills have aluminum inlays. The upper part of the instrument panel is covered with soft, lined material with a leather look. Heavily used components with the piano finish are coated with a novel, UV-cured topcoat that makes them extremely resistant to scratching.

Audi offers a wide range of decorative elements, colors and coverings for the A6 Avant. They include, besides the standard and optional fabric coverings, resilient Milano leather and high-quality Valcona leather. The paint only lightly covers the skin structure to let the material breathe. An Alcantara/leather combination presents another fine alternative. A leather package for the center console, the door armrests and pull handles completes the line.

The seat coverings are available in black, goa beige, nougat brown, titanium gray and velvet beige, the headlining in black, silver and beige. Black, gray, brown and beige tones are available for the interior. Micrometallic platinum inlays are standard, with aluminum trigon moldings as an alternative. As wood veneers Audi offers brown, open-pore ash grain and dark-brown walnut root; a particularly sophisticated option are the piano finish black inlays.

Still more exclusive is Beaufort wood, a veneer made of layered oak. Using a technique specially developed by Audi, the wood is cut from a block containing extremely thin layers alternating in a finely tuned way between untreated and dark-stained wood. Special processing finally provides a fine finish.

The S line sport package immerses the interior in a cool black. The sport seats are covered with Valcona leather or a combination of perforated Alcantara and leather. The covers are black as are the carpeting, the instrument panel and the headlining, with the stitching adding visual touches. The inlays are matt brushed aluminum; S line lettering shines on the fenders and the sills. The steering wheel is specially designed, with the selector lever knob set apart by perforated embossing.

### **Aesthetic overall presentation: the interior lighting**

Audi provides the new A6 Avant with a light package on request. The package comprises exterior courtesy lighting, active door reflectors and white LEDs for the interior. The ambient lighting, also optional, operates in many areas with light guides, providing further effects at the sills, the door pockets and rear reading lamps. Dramatic lighting makes the console on the center tunnel appear to float.

When darkness falls, the ambient lighting, whose brightness can be set via the MMI, makes the interior seem bigger and wider. When the A6 Avant is unlocked, the light spreads through its interior like a wave, starting at the driver's seat. When a door is opened, the light is concentrated on the corresponding seat.

### **Intuitively coherent: the operation**

The new Audi A6 Avant offers more than twice as many functions as its predecessor – and yet operation is intuitively understandable in the typically Audi way. The large, clearly marked round instruments and the center display lie underneath a curved dome; they can be read at a glance and are vividly detailed.

The needles point to six o'clock when in the zero position and run up briefly and fall back down when the car is started. Additional indicators inform the driver about the tank contents and the coolant temperature.

As of the MMI radio plus equipment level, the new Audi A6 Avant has the driver information system (DIS) on board, with a 5-inch or 7-inch white or colored monitor, depending on the version. The DIS consolidates all important information and settings in a menu structure using a main field and two additional information strips. The driver can quickly read off the information without having to look away from the road.

The DIS includes the efficiency program, indicating how individual consumers, such as the rear window heater, are contributing to fuel consumption.

It also includes an enlarged gear-change indicator and gives tips for efficient shifting – a useful aid given that the individual driving style determines about 30 percent of the fuel consumption.

The DIS is operated at the standard leather multifunction steering wheel; the driver also controls the telephone and audio devices at the improved keyboard with its two new rocker switches. Audi offers a whole series of steering wheel versions – with three or four spokes, shift paddles for the automatic transmission, a heated rim and electric adjustment together with easy seat entry. All steering wheels have an inside frame made of ultra-light magnesium materials.

On the center console are located different secondary switches, the slot for the CD or DVD player and the memory card slots. The lower section contains the control unit for the automatic air conditioning; its rotary controls are surrounded by red and blue LEDs.

#### **Efficient and subtle: deluxe automatic air conditioning**

The deluxe automatic air conditioning in the new Audi A6 Avant allows practically draft-free indirect ventilation. It considers the position of the sun, and a moisture sensor helps to avoid fogged windows. The system operates quietly, discreetly and ultra-efficiently. Compared with the previous model's air conditioning, the new system saves about 0.2 liters of fuel per 100 km on average at higher output.

On request, Audi provides the deluxe automatic air conditioning with four-zone control, with a separate control panel for the rear passengers. For the entire interior three climatic styles are available – gentle, medium and intensive. For winter a fourth variant is available that heats the footwell with particular intensity. A residual heat function uses the heat of the engine when the Avant is parked.

Audi also optionally provides a programmable auxiliary heater with a new operating concept. The customer need only select the time at which the heater is to start – the rest is done by the control unit. Its intelligent strategy lowers the power and fuel consumption by 30 to 50 percent.

The center tunnel console of the new Audi A6 Avant contains further controls. The standard start-stop button replaces the ignition lock, and is supplemented by the convenience key. The button for the electromechanical parking brake and the terminal of the MMI (Multi Media Interface) operating system are located on the center tunnel console. The MMI radio with audio tuner, CD drive and eight speakers is standard at Audi.

### **Intelligent and versatile: the MMI operating system**

The MMI terminal presents a new stage in development. In its full version, MMI navigation plus, five hard keys open the main areas of Navigation, Telephone, Radio, Media und Car. Another two hard keys provide the menu overview and return.

The central rotary pushbutton and the four adjacent soft keys are used to navigate through the menus. A separate control island including a rotary volume dial controls the audio section. Another panel includes the touchpad, which can be changed to a surface with six radio station buttons.

The central on-board monitor of the MMI system has a standard diagonal of 6.5 inches and optionally a diagonal of 8 inches, and is enclosed by an ultra-glossy black frame. When not used, the monitor remains recessed in the instrument panel – only the chrome-plated upper edge is visible, acting like a decorative trim. When the ignition is switched on, the monitor first moves forward and then upwards, in a gentle motion with graduated speeds.

As with the DIS, the MMI display area is divided into three zones, while the menu control system follows a clear logic. The new selection menus (Wizards) are especially classy with their circularly arranged icons. Elegant, three-dimensional graphics and computer animations display the menu hierarchy in a catchy way.

## **Everything important at a glance: the head-up display**

On request, Audi provides the A6 Avant with a head-up display, which projects the most important data onto the windshield in the form of symbols and digits. The display takes the form of a virtual image inside a window measuring 262 x 87 millimeters (*10.31 x 3.43 in*). It appears to hover above the engine compartment lid, about 2.3 meters (*7.55 ft*) in front of the driver, directly in the primary field of vision. The height of the picture window can be adjusted.

The driver need not look away from the road in order to register the information; eyes already accustomed to long-range vision do not need to re-adjust. It takes only about half the time to glance at the head-up display that it does to read the display in the instrument cluster – an important safety advantage especially at higher speeds.

Drivers can select what information they wish to have shown in the head-up display via the MMI – for instance the speed, the navigation symbols, the lists of infotainment systems and the displays for the assistance systems. The speed limit display and the night vision assistant also use the system.

Audi is the first automotive manufacturer in the world to offer a full-color head-up display with TFT screen technology. 15 bluish-white LEDs intensively back-light the TFT monitor on which the images are generated. A sensor in the base of the interior mirror adjusts the display to the ambient brightness; the driver can also adjust it at any time.

The LEDs and all other components have an extremely low energy requirement. All components are designed so as easily to withstand the temperatures occurring in the head-up display. The system operates without any active cooling – another factor that boosts efficiency.

The windshield on which the projection occurs enlarges the picture. Two arched correction mirrors in the light path generate a uniform image. This new technology keeps the installation space especially small and leaves designers full freedom in designing the windshield. To avoid double images, the windshield and its safety film have a slightly tapered profile.

In producing the windshield tiny deviations from the ideal surface cannot be avoided. While lying in the range of just a hundredth of a millimeter, they would still lead to a slightly non-uniform picture in the head-up display. Audi avoids this effect: In production of the A6 Avant the display is precisely calibrated to the windshield in each vehicle.

### **Like the luxury class: the seats**

The new A6 Avant offers space aplenty. The large doors with their convenient arresters allow comfortable entry for all passengers; Audi optionally supplies electric power-assisted closing. Large adults also have plenty of room for their heads, arms, knees and feet at all seats.

Compared with the predecessor, the front headroom, the length of the interior and the shoulder width have slightly increased; the front seats have been spread apart by 20 millimeters (*0.79 in*).

The rear bench headrests can be lowered especially far so as not to impair the view to the rear. The optional rear window roller blind shades off the window almost completely. The sun blinds for the rear side windows protect the rear passengers from direct sunlight.

The standard front seats of the Audi A6 Avant can be manually adjusted in 10 different ways – in height, longitudinal position, tilt of the backrest and in the height of the headrests and their distances from the back of the head. The seats have been thoroughly redesigned, and their surfaces ergonomically shaped. The innovative foam in the seats becomes variously soft and hard depending on the zone.

Audi also offers many attractive optional extras. The sport seats with their contoured side sections are adjustable in the height and tilt of the cushions; they also offer electric 4-way lumbar support. The lumbar support is also separately available, as is a seat heater for the front seat or for four seats. The fully electrically adjustable front seats come with a memory function for the driver's seat.



A highlight of the A6 Avant line are the front comfort seats, with electric adjustment and a memory function that also includes the outside mirrors. The backrests and side bolsters plus the lumbar support can be adjusted pneumatically.

On request, Audi will refine the comfort seats with ventilation for the seat surfaces and backrest, employing a novel and especially effective suction technique; the four fans operate at three speeds. Also available is a massage function with ten air chambers, five programs and four intensities – a real treat for the occupant's back.

Only a few switches are needed to operate the seats. All primary adjustments are made using switches that mirror the shape of the seat. A multifunction switch controls the secondary functions, such as adjusting the side bolsters or the massage function, with the MMI monitor showing each step.

The new Audi A6 Avant offers many spacious and practical stowage areas. The locking glove compartment is very large; the front door pockets can accommodate bottles of up to 1 liter. Two other cupholders are located on the center tunnel. Here, an optional armrest and stowage compartment with a continuously variable tilt can also be found.

In the rear there is an additional, folding armrest with a small storage compartment. A 12 V socket, drawers under the front seats and nets behind their backrests complete the range of storage spaces. On request, Audi also provides a storage package with two cupholders in the rear center armrest, two sockets in the rear and a net for the luggage compartment.

### **Luggage compartment**

The new Audi A6 Avant is a versatile companion for its sporty and active owner. Its large, spacious luggage compartment, lined with fine carpeting, has a capacity of 565 liters (*19.95 cubic ft*). The asymmetrically split rear seat backrests can be conveniently folded down using the levers in the walls of the luggage compartment; spring-tensioned, they collapse on the seat cushions. The capacity then expands to 1,680 liters (*59.33 cubic ft*).

The large luggage compartment can be superbly used, thanks to the flat side walls allowing a load-through width of 105 centimeters (*41.34 in*) and the low loading edge, lying at a height of 63 centimeters (*24.8 in*) and practically flush with the loading floor. The loading length is 118 centimeters (*46.46 in*), with 75 centimeters (*2.95 in*) added when the backrests are folded down. Bag hooks, side fastening belts, a tray for dirty items under the loading floor and roof rails are standard, as are four large tie-down rings that can be moved on rails at the edges of the loading floor as required.

Audi offers many practical and intelligent details as options – a load-through hatch for the rear seats with a removable ski bag, a reversible mat or a load-securing kit for flexibly dividing the space by means of a telescopic rod and a fastening belt. The standard luggage compartment partitioning net is contained in its own cassette and can be fastened in two positions.

In addition, an electric drive for the tailgate is optionally available; its opening angle can be set individually. Its perfect companion is the new electric luggage compartment cover – guided by rails into the D-pillar paneling, it follows the tailgate.

If the optional convenience key and electrically opening tailgate are chosen, the sensor control for the automatically opening tailgate is also provided – a wholly new feature in the vehicle's class. A sensor in the rear detects the driver by means of the vehicle key he is carrying. When he stands behind the car and performs a certain, defined pattern of motion with his foot, similar to a kicking motion, a proximity sensor causes the tailgate to open. Should it encounter any resistance, it stops automatically. The system makes life much easier for Avant owners.

The accessories program includes many features for transporting sports and recreational equipment, from roof racks to the partition grille. The new A6 Avant is a powerful towing vehicle, with a rated towing capacity of 2,100 kilograms (*4,629.71 lb*). Should the trailer start to skid, an additional feature of the ESP stabilization system takes action, and dampens the oscillations until the Avant's wheels brake in opposite phases.

## **Multimedia systems**

The new A6 Avant sets new standards in its class in many areas – including the technological fields of navigation and infotainment. Audi has a modular system of elements in store. At the top of the line is MMI touch with its pioneering touchpad control.

The standard version, MMI radio, has a single CD drive that can also read mp3, WMA and ACC formats. Two antennas ensure reliable radio reception, while eight passive speakers make sure the sound is good.

MMI radio plus forms the first expansion level. At the heart of the system is a high-performance dual-core processor. A dual tuner and digital signal processing improve FM reception. The system includes two SDHC card readers, a Bluetooth interface for the telephone and the driver information system with a five-inch display. Sound is produced via the Audi sound system. A six-channel receiver pumps 180 watts of power to ten speakers, including a subwoofer and a center speaker.

MMI navigation, the third variant, includes dynamic route guidance. The data comes from an SD card, with voice control being standard. MMI navigation has an additional, third tuner that exclusively receives TMC traffic reports.

### **Multimedia center: MMI navigation plus**

The top model in the infotainment line is MMI navigation plus with MMI touch, consisting of two blocks. The radio unit combines the functions of tuner and sound system. The main unit integrates other components, including a DVD drive, two card readers and a 60 GB hard drive with the navigation data. A third of its capacity is reserved as memory for telephone and music data. Two processors ensure that all applications run quickly, simultaneously and smoothly.

A graphics processor from NVIDIA, the market leader, generates the three-dimensional images in top quality. The map is a high-resolution 3D model with points of interest in many cities recreated in great detail.

The driver can choose between route guidance using the classic arrows or a new, animated display rich with detailed information. The central on-board monitor has a diagonal of 8 instead of 6.5 inches. Thanks to its high resolution of 800 x 480 pixels, it delivers superbly sharp images in brilliant color.

### **Touchpad control: MMI touch**

MMI navigation plus comes with a groundbreaking innovation from Audi: MMI touch with black panel technology. The driver enters a destination or the telephone number by drawing the letters and numbers – even using characters from Asian languages – on the touch-sensitive control panel with a finger. The system provides acoustic feedback after each character so that the driver's eyes can stay on the road. With MMI touch you can also move the map around and scroll through lists. The push of a button transforms the pad into a control panel containing six freely selectable radio stations.

The touchpad consists of the sensor module and the computer placed underneath – its processor detects the characters drawn by the driver and relays them to the MMI system. The sensor module constitutes the touch-sensitive film incorporating numerous conductor tracks, and the top shell; white high-performance LEDs illuminate it from below. A special coating ensures that the shell withstands 600,000 entries at no detriment to the impression it conveys of fine quality.

At the same time, MMI navigation plus in the new Audi A6 Avant also offers the customary control level with its large rotary pushbutton. Finally, the system also features advanced speech control that allows the city and the street to be entered as a spoken command. The voice control also discloses the telephone and music data on the hard drive.

The new MMI navigation plus works very closely with the assistance and safety systems on board the new Audi A6 Avant. Its database describes the entire European road system. The navigation system analyzes this data predictively, reading the selected course in advance.

Through a data bus the information passes to the computers controlling the adaptive cruise control with stop & go function, the headlights and the automatic transmission. These systems can then precisely adapt their operation to conditions in advance.

Other elements complete the infotainment line. They include a CD/DVD changer in the glove compartment, a dual tuner for digital radio reception (digital audio broadcasting, or DAB) and a digital TV tuner. The Audi music interface conveniently integrates a mobile player or an iPhone in the audio system. The Bluetooth cell phone preparation includes a hands-free unit, operated via the MMI, the voice control or the multifunction steering wheel.

An AV adapter for video and picture sources is due to follow a bit later. USB adapters make the connections to external terminals. A rear seat entertainment system with two 10-inch monitors is also in preparation.

### **The ultimate in sound: the sound systems**

Audi provides the surround sound system from Bose on request. Its 12-channel amplifier with over 600 watts of power controls 14 speakers together with a subwoofer and center speaker to provide a lush, lifelike and precise sound. Combined with MMI navigation plus and thanks to a special algorithm, the Bose system also outputs stereo signals in 5.1 sound.

The top version, the Advanced Sound System from Bang & Olufsen, ups the ante with two amplifiers and 1,300 watts of power. The system from the Danish specialists will impress even discerning hi-fi aficionados with a finely differentiated, broad frequency spectrum, a powerful bass, transparent middle tones and crystal-clear treble tones.

The company's own up-mix algorithm divides stereo signals among up to seven channels and can simulate the sound reflections of a concert hall. The 900 watt amplifier for the bass speakers employs the manufacturer's ICE Power Technology. Especially energy-efficient with this technology, the amplifier is also compact and lightweight.

The Advanced Sound System includes 15 active speakers with polished aluminum moldings. The boxes in the front doors are closed, emitting no frequencies through the sheet metal surfaces. The instrument panel contains two elegant acoustic lenses for the high frequencies; they extend upwards when the system is started.

## **Audi connect**

When it comes to Internet access, and connection technology, Audi has a great head start over the competition, to the full benefit of passengers in the new A6 Avant. While on the road they can surf and e-mail as they please, while the driver can use the many online services of Google.

The new technologies are present in concentrated form in the optional Bluetooth online car phone. Its centerpiece is a UMTS module housed in the head unit of the MMI navigation plus. The modulation method of HSDPA (High Speed Downlink Packet Access) achieves a very fast UMTS data transfer speed of up to 7.2 MB per second; encryption using the WPA2 standard guarantees high security. In rural areas, the UMTS module switches over to EDGE connectivity technology, which uses the GSM network.

The Bluetooth online car phone is operated by voice control, MMI navigation plus or with the multifunction steering wheel. A separate Bluetooth headset is optionally available for discreet phoning. Communication with the Internet takes place via the roof antenna. The Bluetooth online car phone incorporates a Wi-Fi hotspot. The passengers can use it to connect as many as eight terminal devices to the internet simultaneously, from laptop to iPad, whatever their operating system.

All the driver of the new A6 Avant needs to go online is a data-capable SIM card. Alternatively, the driver can connect his or her cell phone to the system via Bluetooth if the phone supports the SIM Access Profile. No additional fees or separate contracts are required. Given the high data volumes, however, Audi does recommend a flat rate.

The Bluetooth online car phone offers many attractive services. The driver of the A6 Avant can plan his or her travel route on the computer, save the information in an area of the internet site [www.audi.com](http://www.audi.com) and from there download the data to the navigation system via UMTS at the start of the trip.

Through the fast connection the A6 Avant also downloads three-dimensional satellite images and aerial photos from Google Earth. These appear in a bird's eye view on the monitor, and the computer fills in the roads. A large amount of additional information is delivered to the car with the images. The Bluetooth online car phone also retrieves specially prepared news and weather reports and points of interest from Google Maps.

### **Traffic jam information in real time: Audi online traffic information**

New in the Audi line – and therefore on the entire market – is another connection element: Audi online traffic information informs the driver in many European countries in real time about the traffic situation along the selected route. To this end the system uses the motion profiles generated by hundreds of thousands of smart phones and navigation devices and processed at a central location. If the cell phone is located in the car, the traffic flow can be inferred.

On entering the desired route before starting off, the driver receives congestion images for the entire route, even if the destination is, say, Rome or Paris. Segments will appear green, yellow, orange or red depending on the traffic congestion.

The real-flow data marks a quantum leap compared with the conventional RDS TMC reports by the radio stations. The data is ultra-precise and the very latest, and also includes intra-urban roads and, above all, cities. The Audi online traffic information describes the congested spots in short texts and specifies the probable loss of time in minutes. Its findings are also incorporated in the planning of the route and detours. The service is starting in Central Europe, France and Italy, with other European countries to follow soon.

### **Convenient and informative: finding points of interest through Google**

A second new connect service is the search for points of interest. Searching is now possible online with Google – particularly conveniently via voice control. The driver need merely select a destination and enter the desired key term or phrase – such as “Italian restaurant.”

The voice command, or “voice tag,” is converted to a small data package and is sent via UMTS to Google’s powerful search engines. The responses appearing on the MMI monitor are highly differentiated – in many cases they contain the phone numbers of the restaurants and various additional information.

A bit later a third pioneering connect function will follow: Google Street View already shows in advance how the destination will look from the car. This considerably facilitates orientation on reaching the location.

### **Driver assistance systems**

On request, Audi provides the new A6 Avant with a wide range of driver assistance systems. They are tightly networked with one another and with other systems in the vehicle, making them extremely versatile, intelligent and efficient. Especially over long distances they make driving even more relaxed, confident and pleasant.

The electronic network in the new A6 Avant is so complex that it has received a whole new architecture: The FlexRay bus system networks many control units from driver assistance and suspension, and significantly speeds up the data transfer between them.

### **The core: adaptive cruise control with stop & go function**

The central driver assistance system in the new A6 Avant is the adaptive cruise control (ACC) with stop & go function and Audi pre sense front. The high-end radar cruise control system regulates the speed and the distance to the vehicle ahead by accelerating and braking in a speed range from zero to 250 km/h (155.34 mph), and brakes automatically within certain limits.



The driver can use the MMI operating system to determine how comfortable or sporty travel should be – three levels and four distance stages are available.

ACC stop & go is intensively networked in the vehicle, analyzing the data from up to 26 other systems. The most important information comes from its own two long-range radar sensors, however. Located in the lower part of the front end, they operate in the frequency range between 76 and 77 GHz and cover an area of 250 meters (820 ft) in length with a total angle of aperture of 40 degrees. A small video camera mounted in the base of the interior mirror looks 60 meters (197 ft) ahead, also with an angle aperture of 40 degrees.

With this high level of information, the system can recognize complex scenarios and predictively support the driver. It also uses the predictive route data from the navigation system so that it can also reliably calculate the proper line on the highway even in curves.

Whether changing lanes, traveling on winding roads, passing or turning off, the ACC stop & go function resolves the situation as judiciously and confidently as an accomplished driver, making driving even more fluid and harmonious. Its range of application also includes motion through urban traffic, where the system acts especially comfortably, decelerating the A6 Avant to a stop. In subsequently automatically starting off again, the system also uses the signals supplied by the ultrasound sensors of the Audi parking system located in the front bumper.

### **Complex safety system: Audi pre sense**

The Audi pre sense safety system is available in a number of different versions in the new A6 Avant, and works closely together with a series of other systems. In the standard version, Audi pre sense basic, the system intervenes on detecting an unstable driving situation via the sensors of the ESP stabilization system. In this case, Audi pre sense makes sure that the front seat belts are electrically tautened and that the sunroof and the windows are closed down to a small gap.

Together with ACC stop & go, the new A6 Avant also has Audi pre sense front on board. From a speed of 30 km/h (*18.64 mph*) it helps the driver avoid threatening accidents or diminish their effects. In a critical situation the integrated Audi braking guard is active. It warns the driver first with an acoustic and then with a visual signal. Parallel to this, the brake system is prefilled and the shock absorbers of the optional adaptive air suspension are set to hard.

If the driver remains passive, a warning jolt – the brief activation of the brakes – is performed in the second stage. The seat belts are slightly tensioned at the same time. When the driver now steps on the pedal, the hydraulic brake assist increases the braking power accordingly. Should the driver ignore the warning jolt, autonomous partial braking occurs, which decelerates the A6 Avant at 3 m/s<sup>2</sup>; the precondition is that the preceding vehicle is moving. Windows and the sunroof are closed, the adaptive brake light is activated and the seat belts are greatly tensioned.

If the A6 Avant is equipped with the full version of Audi pre sense – Audi pre sense plus as part of what is known as the assistance package – a third and a fourth stage follow in the event of an emergency. The system now increases the deceleration to 5 m/s<sup>2</sup> and tightens the belts completely. The last braking phase – the autonomous full brake application – occurs roughly half a second before an inevitable collision. The collision and its consequences are greatly reduced, for by the time the impact occurs the A6 Avant can reduce its speed by as much as 40 km/h (*24.85 mph*).

Another Audi pre sense subfunction, Audi pre sense rear, is coupled with Audi side assist. If the system detects an imminent rear-end collision, it uses the adaptive brake light to warn the traffic behind, and initiates preventive protective measures if the situation turns critical.

### **Help when changing lanes: Audi side assist**

Audi side assist including Audi pre sense rear is also activated at speeds above 30 km/h (18.64 mph). Two radar sensors in the rear monitor the events behind the A6 Avant up to a distance of 70 meters (230 ft). If a detected vehicle is assessed to be critical for a lane change, a yellow LED in the housing of the outside mirror lights up. If the driver still activates the turn signal to change lanes, the indicator becomes brighter and begins to flash quickly – a signal that is hard to miss.

### **Always in the lane: Audi active lane assist**

The latest new attractive assistance system in the A6 Avant is Audi active lane assist, which becomes operational at 65 km/h (40.39 mph). It uses a video camera mounted at the interior mirror to detect the lane markings. The image processing software can distinguish between up to eight lines and their colors.

If the A6 Avant approaches a line without signaling, the system helps the driver to steer back into the lane by subtly intervening in the electromechanical steering. The driver uses the MMI to determine how soon the intervention should occur and whether it should be accompanied by a steering wheel vibration and a warning tone.

Audi active lane assist also intervenes given the threat of skidding, supporting correct countersteering by briefly amplifying or reducing the power steering. The system can then include objects in the neighboring lane and along the edge of the road in its strategy. It also uses steering movements to determine when the driver's concentration begins to slack off and adjusts its interventions accordingly.

### **Clear information: the speed limit display**

The speed limit display can detect speed limit signs, plates below these signs and signs lifting these restrictions and present these signs as graphics in the display of the driver information system or in the optional head-up display. To this end the system analyzes the images supplied by the video camera at the interior mirror.

### **Long-range vision in the dark: the night vision assistant**

Another high-end system in the new Audi A6 Avant is the night vision assistant with highlighting of detected pedestrians. Its far infrared camera (FIR) reacts to the heat emitted from objects. A computer converts the information from the camera to black and white images and shows them on the driver information system's display.

While the cooler surroundings appear dark, animals and people appear strikingly bright. The image-processing software detects people up to 100 meters away and highlights them with yellow markings on the display. If the computer estimates a hazardous situation to lie ahead, it is marked red and a warning gong sounds. The red warning also appears optionally in the head-up display.

The far infrared camera is mounted in one of the Audi rings in the single-frame grille. With its 24 degree angle of aperture, the camera can look ahead up to 300 meters (984 ft), far beyond the high beam range. A protective window protects the camera from stone chipping; in the cold it is heated and if dirty cleaned together with the headlights. Like every assistance system, the night vision assistant also works within certain system limitations.

### **Parking with no trouble: the park assist**

For conveniently parking, Audi offers various options. The Audi parking system employs acoustic and visual indicators. The reversing camera can be added to the system, and operates with a fish eye lens.

With the aid of image processing software, the camera shows the area behind the A6 Avant without distortion on the MMI monitor, with superimposed grid lines and auxiliary surfaces.

An innovation from Audi in the new A6 Avant is the park assist system. It uses 12 ultrasonic sensors that detect and measure spaces on the side of the road when driving at a moderate speed. If one of them is large enough, a note to this effect appears in the large DIS display.

Once the driver now puts the car in reverse, the system takes over the work of steering – the driver need only do the accelerating and braking.

The park assist system maneuvers the A6 Avant into both parallel and perpendicular spaces relative to the road. When parallel parking, the space must be just 0.80 meters (*2.62 ft*) longer than the car. If necessary, the system will make multiple maneuvers, forwards and backwards. It assists in the same way when leaving the parking space. The maximum speed in maneuvering is 7 km/h (*4.35 mph*).

Another innovation in the vehicle class will follow at a later time – the Audi parking system plus with 360° camera. Four small cameras – in the single-frame grille, in the rear and in the housings of the side mirrors – record images of the A6 Avant's immediate surroundings.

A computer compiles the information; the driver can obtain different views on the large car monitor, including a view from above. The Audi parking system plus with 360° camera increases safety when maneuvering and in narrow driveways – here special views show the areas in front of and behind the Audi A6 Avant, and give a glimpse of the cross traffic.

## **The engines**

The new Audi A6 Avant enters the market with five possible engines: one four-cylinder unit and four V6 engines. Their output lies between 130 kW (177 hp) and 220 kW (300 hp); they operate with power, a refined sound and high efficiency. A bit later the 3.0 TDI will follow, mobilizing 230 kW (313 hp) with its biturbo technology. All engines have direct fuel injection, four of them are turbocharged – a downsizing concept affording impressive efficiency.

Compared with the previous model, fuel consumption in the model series has decreased by up to 21 percent, yet power and torque have increased. With a manual transmission the 2.0 TDI consumes on average only 5.0 liters of fuel per 100 km (*47.04 US mpg*); its CO<sub>2</sub> emission is only 132 grams per km (*212.43 g/mile*), a best value in the segment.

All engines in the new A6 Avant employ the technologies from Audi's modular efficiency platform. Optimized with regard to internal friction, they also have innovative thermal management, a recuperation system a start-stop system on board – regardless of the transmission used.

### **Powerful turbocharging: the 2.0 TFSI**

In the coming year, the 2.0 TFSI will be added to the model line in Germany. The four-cylinder turbocharged engine with its 1,984 cc is ultra-refined in sound, with two balancing shafts in the crankcase counteracting the second-order mass forces.

The two-liter engine comes with the Audi valvelift system, which switches the stroke of the exhaust valves between two stages as required. The system improves the gas exchange and thereby further increases the tractive power.

The 2.0 TFSI has an output of 132 kW (180 hp) and 320 Nm (*236.02 lb-ft*) of torque, with full tractive power already available from 1,500 rpm right up to 3,900 rpm. In the manual transmission version, the four-cylinder TFSI accelerates the Audi A6 Avant in 8.1 seconds to 100 km/h (*62.14 mph*) and then on to its maximum of 232 km/h (*144.16 mph*). Per 100 km it gets by with 6.5 liters of fuel on average (*36.19 US mpg*). Audi has the engine constantly coupled to the front-wheel drive. Optionally, the engine is combined with the 6-speed manual transmission or with the continuously variable multitronic.

### **Sleek and strong: the 2.8 FSI**

The smaller of the two V6 gasoline engines placed by Audi in the new A6 Avant is itself a powerful unit. The 2.8 FSI with its high-class sound – and the only naturally aspirated engine in the line – generates 150 kW (204 hp) and 280 Nm (*206.52 lb-ft*) of torque, the latter at 3,000 to 5,000 rpm, from its 2,773 cc displacement.

The 2.8 FSI employs a special efficiency technology – the Audi valvelift system, which switches the stroke of the intake valves between two stages depending on the load and engine speed. This is served by the so-called cam pieces – cylindrical sleeves that are electromagnetically moved on the camshaft. The Audi valvelift system regulates the amount of air drawn in when the valves open; the throttle valve can remain fully open, thus largely eliminating throttling losses. The engine produces more power and torque while fuel consumption is reduced.

The A6 Avant 2.8 FSI with multitronic and front-wheel drive accelerates in 7.9 seconds from zero to 100 km/h (*62.14 mph*) and continues to 230 km/h (*142.92 mph*). On average it consumes only 7.4 liters of fuel per 100 km (*31.79 US mpg*), with a CO<sub>2</sub> emission of 172 grams per km (*276.81 g/mile*). The decrease relative to the predecessor is 14 percent, coupled with an increase in power of 10 kW (14 hp). At Audi the front-wheel drive and manual transmission are standard with the 2.8 FSI, with multitronic optionally available. S tronic and quattro permanent all-wheel drive form a further combination.

### **Supercharger thrust: the 3.0 TFSI**

The 3.0 TFSI, mobilizing a displacement of 2,995 cc, generates 220 kW (300 hp). Its maximum torque of 440 Nm (*324.53 lb-ft*) is available at 2,900 to 4,500 rpm. Located in the 90-degree V of the cylinder banks is a supercharger driven by the crankshaft via a belt. It compresses the intake air up to 0.8 bar. Two intercoolers cool the compressed and heated air again so that even more oxygen enters the combustion chambers.

The gas pathways downstream of the mechanical charger are very short, so that the torque builds up fast and spontaneously. The supercharger is located downstream of the throttle valve. Because the intake air has only a low density at loads below turbocharging and in deceleration mode, the rotors run easily and with little drive power. An extensive package of measures effectively reduces supercharger noise.

The high-revving and refined 3.0 TFSI drives the A6 Avant like a sports car. The sprint to 100 km/h (*62.14 mph*) takes just 5.6 seconds, and top speed is limited to 250 km/h (*155.34 mph*). The standard fuel consumption is limited to 8.2 liters per 100 km (*28.68 US mpg*) – with a CO<sub>2</sub> emission of 190 grams per km (*305.78 g/mile*) and an improvement of 15 percent compared with the predecessor, which produced 7 kW (10 hp) less. The 3.0 TFSI is firmly coupled to the S tronic and the quattro drive.

### **Exemplary efficiency: the 2.0 TDI**

The most efficient engine available for the new A6 Avant is the 2.0 TDI – the greatly modified four-cylinder unit produces 130 kW (177 hp) and generates 380 Nm of torque at 1,750 to 2,500 rpm. The diesel engine has a displacement of 1,968 cc at its disposal; two balancing shafts in the crankcase smoothen its operation. The turbocharger with adjustable vanes builds up torque spontaneously and early.

Thanks to the excellent thermodynamics, the four-cylinder TDI can be operated with a high rate of recirculated and greatly cooled exhaust gas – the cooler combustion significantly reduces the raw emissions of nitrogen oxides.

In interplay with the manual transmission, the 2.0 TDI powers the Audi A6 Avant from zero to 100 km/h (*62.14 mph*) in 9.0 seconds, and attains a top speed of 222 km/h (*137.94 mph*). In the EU cycle the four-cylinder TDI manages with just 5.0 liters per 100 km (*47.04 US mpg*) – a CO<sub>2</sub> emission of 132 grams per km (*212.43 g/mile*). Compared with the previous model, at 125 kW (170 hp), fuel consumption has decreased by 13 percent. Audi provides the A6 Avant 2.0 TDI exclusively with front-wheel drive – standard with manual transmission, optionally with multitronic.

### **Potent diesel: the 3.0 TDI**

The 3.0 TDI is available in three variants. All versions of the 2,967 cc V6 diesel are new from the ground up. It weighs only 193 kilograms (*425.49 lb*), which is 25 kg (*55.12 lb*) less than its predecessor.



Six kilograms (*13.23 lb*) of weight were trimmed from the crankcase alone, which is manufactured of high-strength vermicular graphite cast iron. The rotating masses are also lighter – as the driver notices from the way the engine spontaneously and easily revs up.

The greatly reduced internal friction in the crank drive, the lean, newly designed drive for the camshafts and the ancillaries and also the regulated oil pump make significant contributions to the engine's efficiency. Other improvements concern the common rail injection system, which can deposit up to six partial amounts in the cylinders, the intake and exhaust gas system, the exhaust gas recirculation and the turbocharger with intercooler.

In the entry-level version the 3.0 TDI supplies 150 kW (204 hp), with 400 Nm (*295.02 lb-ft*) of torque available at 1,250 to 3,500 rpm. The timing of the cam shafts, the turbocharger and the common rail system – with an injection pressure of 2,000 bar – has been specially optimized for low fuel consumption.

Combined with multitronic, the average consumption rate lies at 5.2 liters per 100 km (*45.23 US mpg*), and the CO<sub>2</sub> emission at 136 grams per km (*218.87 g/mile*). Compared with the predecessor, with 140 kW (190 hp), fuel consumption has decreased by 21 percent. The A6 Avant 3.0 TDI with front-wheel drive accelerates with multitronic to 100 km/h (*62.14 mph*) in 7.4 seconds and reaches a top speed of 230 km/h (*142.92 mph*). Alternatively, the basic version with manual transmission and the combination of S tronic and quattro drive are available.

The second version of the 3.0 TDI achieves 180 kW (245 hp) and 500 Nm (*368.78 lb-ft*) of torque, available at 1,400 to 3,250 rpm. S tronic and quattro drive are standard with this engine version. The standard sprint is accomplished in 6.3 seconds, with a maximum speed of 243 km/h (*150.99 mph*). On average the mid-level V6 TDI requires only 5.9 liters of fuel per 100 km (*39.87 US mpg*), with a CO<sub>2</sub> emission of 156 grams per km (*251.06 g/mile*). This is a decrease of 18 percent compared with its predecessor with 176 kW (240 hp).

At a later point in time Audi will also offer a clean diesel version of the 3.0 TDI with 180 kW (245 hp). Elaborate measures will reduce the NO<sub>x</sub> emissions to the extent that the engine meets all currently applicable US emission limits as well as the future EU6 limits.

### **Diesel power: 3.0 TDI with 230 kW (313 hp)**

At the head of the engine line for the Audi A6 Avant is a new unit, the 3.0 TDI with 230 kW (313 hp). It is designed as a biturbo engine, with two chargers connected in series combining to generate thrust. They are joined together by a vacuum-operated valve known as the turbine changeover valve. Both chargers are water-cooled, while a pulsation shock absorber reduces their vibrations. An optimized intercooler lowers the temperature of the compressed air again and thereby increases the fresh air mass in the combustion chamber.

At low revs the turbine changeover valve is closed, the small charger with its variable turbine geometry does most of the work, and the large charger does the pre-compression. From about 2,500 rpm, the valve starts to open and the small charger increasingly transfers the major share of work to its counterpart. In the range between 3,500 and 4,000 rpm the valve opens completely, and only the large charger still operates.

The high-performance concept also led to modifications at the engine itself, namely in the cooling of the cylinder heads, in the timing and strokes of the intake camshafts and in the pistons and their injection oil cooling. A special coating reduces friction of the piston pins.

The machining of the engine block at the Győr engine plant in Hungary employed high-end methods such as plate honing and laser exposure – as with many Audi engines. The common rail system builds up to 2,000 bar of pressure and injects up to eight partial amounts in the cylinder; the controlled oil pump and the water pump are optimized for maximum efficiency.

The elaborate technology leads to impressively powerful performance. The top TDI already provides its maximum torque of 650 Nm (*479.42 lb-ft*) from 1,450 to 2,800 rpm. It revs up to 5,200 rpm with no difficulty at all, with a sporty and classy sound through the entire rev range; it is an engine for driving pleasure, and powers the Audi A6 Avant with effortless ease. The standard sprint is achieved in 5.3 seconds, and the regulated maximum of 250 km/h (*155.34 mph*) is just a formality.

The 3.0 TDI with 230 kW (313 hp) is firmly coupled to the 8-speed tiptronic and to the quattro permanent all-wheel drive. Its average fuel consumption is just 6.4 liters per 100 km (*36.75 US mpg*), with a CO<sub>2</sub> emission of 169 grams per km (*271.98 g/mile*).

Another new development appears for the first time in the biturbo 3.0 TDI – a sound actuator integrated in the exhaust gas system. This feature basically consists of a speaker located in an auxiliary channel of the exhaust gas system.

With a modulation method it imposes a defined oscillation pattern on typical exhaust gas noises and accompanies the power generation of the biturbo 3.0 TDI with a lush, sonorous soundscape.

### **Effective: the efficiency technologies**

In all engines of the new A6 Avant the technologies from Audi's modular efficiency platform make a crucial contribution to reducing fuel consumption. The innovative thermal management, the start-stop system and the recuperation system particularly deserve mention in this regard.

The innovative thermal management reduces the fuel consumption by about 0.1 liters per 100 km, ideally distributing the temperature flows between the engine, the transmission and the interior in any situation.

Following a cold start, thermal management quickly brings the engine up to operating temperature – the phase of the increased friction resistance due to cold and viscous oil is greatly reduced. In the two gasoline engines and in the 2.0 TDI, a switchable water pump or ball valve uncouples the engine from the cooling circuit in the warm-up phase.

For the 3.0 TDI the innovative thermal management is even more elaborate. The crankcase and the cylinder heads each have their own coolant circuits connected to one another by a valve. In the warm-up phase and in some situations with low load and engine speed, the coolant in the block is not recirculated, and the oil cooler is bypassed. In these phases the interior is heated through a head circuit.

### **Reducing fuel consumption: the start-stop system**

The start-stop system lowers fuel consumption in the standard driving cycle by up to 0.4 liters per 100 km. The system switches off the engine when the Audi A6 Avant comes to a stop. The driver must keep the brake pedal depressed (with automatic transmission) or release the clutch pedal (manual transmission).

A powerful starter, supplied by a powerful and cycle-resistant battery, restarts the engine quickly and conveniently when the driver releases the brake or steps on the clutch again. With the TDI engines a special function maintains fuel pressure in the rail when the vehicle stops. The start-stop system is only inactive during the early warm-up phase, on steep slopes or if it is extremely cold. The system, which the driver can switch off at any time, operates with either manual or automatic transmission.

The recuperation system affords a fuel saving of about 0.2 liters per 100 km. In the coasting and braking phases of the A6 Avant an intelligently controlled alternator converts the kinetic energy to electrical energy, which is then buffered in the battery. When the A6 Avant accelerates again, the current flows back into the vehicle's electrical system. This relieves the alternator, which can now be operated at a lower voltage.

With its unusually high efficiency, the alternator in the Audi A6 Avant is the core of a new energy management system that monitors and regulates all electric currents in the vehicle. The system makes sure there is enough power for starting the engine after a long standing time, and ensures that the important electrical systems can operate even when the vehicle is stationary.

The electrical system of the new A6 Avant has the form of an “H,” with its cross beams lying under the rear seats. Many control units are also placed in this area to keep cable lengths short. Audi also kept low weight in mind for the electrical system: The cross-sections of all the wires were minimized, and the main battery lead is made of aluminum rather than copper.

Progress in the new A6 Avant was also achieved with the exhaust gas systems. High-quality stainless steel and newly computed geometrical configurations allow thinner walls, improving lifetimes and greatly reducing the weight. Thanks to the low fuel consumption, Audi was able to reduce the fuel tank capacity to 65 liters (*17.17 US gallons*) or 75 liters (*19.81 US gallons*), in models with quattro drive – another element of the lightweight design concept.

## **Power transmission**

Audi offers a broad range of power transmissions for the A6 Avant, so that the new model expands a great strength of the previous model series. The selection comprises the front-wheel and quattro drive systems, the manual 6-speed transmission, the continuously variable multitronic, the 8-speed tiptronic and the 7-speed S tronic – the dual clutch transmission with lightning-fast shifts is new in the A6 Avant. All automatic transmissions are optionally available with shift paddles on the steering wheel.

The Audi A6 Avant 2.0 TDI rolls off the assembly line with front-wheel drive. Customers of the 2.8 FSI and 3.0 TDI with 150 kW (204 hp) can choose between front-wheel drive and quattro drive. The 3.0 TFSI and the 3.0 TDI with 180 kW (245 hp) and 230 kW (313 hp) are firmly coupled to the permanent all-wheel drive.

Manual transmissions are standard with the 2.8 FSI, the 2.0 TDI and the 3.0 TDI with 150 kW (204 hp). For these three engines multitronic is available, in combination with front-wheel drive. The 3.0 TFSI and the 3.0 TDI with 180 kW (245 hp) are available exclusively with the 7-speed S tronic; the 3.0 TDI with 230 kW (313 hp) is firmly coupled to the 8-speed tiptronic.

Audi has intensively refined all transmission models, which are characterized by their quick operation, minimal internal friction and high efficiency. Their wide gear spreads allow for both sporty acceleration in the lower gears and low revs at high speeds. The automatic transmissions receive the route data from the navigation system so as to incorporate upcoming curves in their gearshift strategy and avoid unnecessary gear changes on winding or hilly roads, for example.

On all transmissions, the differential is positioned upstream of the clutch, i.e. directly behind the engine. The development engineers were therefore able to move the front axle forwards by 71 millimeters (*2.8 inches*) relative to the predecessor model, resulting in a long wheelbase and better distribution of the axle loads.

All automatic transmissions in the new A6 Avant are integrated in the engine's thermal management via their own heat exchangers. Once the engine has heated enough coolant, the hot water continues flowing to the heat exchanger of the transmission, where it quickly brings the fluid to operating temperature. Warm transmission fluid is cooled by the oil cooler as required.

### **Extremely fast: the 7-speed S tronic**

With the 7-speed S tronic two oil-cooled multi-plate clutch systems serve two mutually independent transmission sections. The large K1 clutch located on the outside directs the torque via a solid shaft to the gear wheels for gears 1, 3, 5 and 7. A hollow shaft rotates around the solid shaft. It is connected to the smaller K2 clutch, which is located inside its larger sibling, and which acts on the gear wheels for gears 2, 4 and 6, as well as reverse.

Both transmission structures are continuously active, but only one is connected to the engine at any one time. For example, when the driver accelerates in third gear, the fourth gear is already engaged in the second transmission sections. The shifting process takes place as the clutch changes – K1 opens and K2 closes. Shifting gears takes only a few hundredths of a second and is completed with almost no interruption of traction. Shifts are so fluid, dynamic and smooth as to be barely noticeable.

The 7-speed S tronic has several operating modes ready at hand. In fully automatic mode there are the D (Drive) and S (Sport) modes; added is an optional manual level, in which the transmission takes on a sporty tone. The spread of the 7-speed S tronic reaches 8.1, depending on the engine.

### **Dynamic: the 8-speed tiptronic**

The 8-speed tiptronic of the 3.0 TDI with 230 kW (313 hp) is a classical torque-converter transmission, with an overall spread of 7.0 : 1. It reduces fuel consumption by roughly six percent over the 6-speed tiptronic in the previous model. All gear changes are flexible, spontaneous, fast and ultra-flexible.

The gear sets and shift elements are constructed in a new way, so that the 8-speed tiptronic manages with relatively little installation space.

The torque converter lockup clutch with the integrated shock absorber also plays an important role in the efficiency concert. Closed in normal automotive operation, the clutch connects the transmission directly to the engine. It works with limited slip in certain situations, which permits very low engine speeds in interplay with the shock absorber, without the occurrence of vibrations.

When the A6 Avant is stationary, an internal clutch separates the transmission from the engine, even if the D mode is still engaged – this avoids loss from recirculating fluid in the converter. The clutch re-engages as soon as the driver releases the brakes.

The dynamic shift program (DSP), which controls the 8-speed tiptronic, is located in a small steel box inside the gearshift unit. In D mode, the DSP prefers high gears and low engine speeds in the interest of efficient driving; in the sporty S mode, it stays in the gears longer during acceleration.

### **Continuously variable: multitronic**

The flexible multitronic transmission has been greatly overhauled for use in the new A6 Avant. It nearly always allows the engine to operate in the range of its optimal efficiency. For the dynamic driver it provides a sporty mode with short gear ratios and a manual mode with eight fixed gear ratios. The variator, the central component of the multitronic, allows a spread of 6.7 between the shortest and the longest ratios.

The variator's method of operation is ingeniously simple. A plate link chain transmits the power between two variable conical pulley pairs – one located on the input shaft, the other on the output shaft. When the faces of the two conical pulleys are pushed apart or pulled closer together, the chain runs on different radii, steplessly altering the gear ratio.

The electronically controlled, hydraulic multi-plate clutch also contributes to the multitronic transmission's efficiency by disconnecting it from the engine when the car is at rest.

### **Total traction: quattro drive**

Audi offers the new A6 Avant with quattro permanent all-wheel drive. Normally 60 percent of the engine torque goes to the rear axle and 40 percent to the front – a sporty trait. For all 6-cylinder models the quattro drive system is already either standard or optionally available.

The torque vectoring function is an intelligent software solution in brake management, and can act on each of the four wheels separately. When driving fast through a curve, the software computes the optimal distribution of power.



If a change in wheel loads suggests that the wheels on the inside of the curve are about to slip, it marginally brakes these wheels – just a slight application of the pads on the disks at minimal pressure is all that it takes. The wheel on the outside of the curve can then transmit a higher torque.

The control system intervenes continuously. The new A6 Avant remains neutral for an extremely long time at the handling limits; the slight understeer when turning into curves and when accelerating is essentially offset. The ESP stabilization program intervenes later and more gently – if it is even necessary at all.

### **Like on rails: the sport differential**

For the top engine versions of the new A6 Avant, Audi optionally provides the sport differential. The high-end rear-axle differential provides even greater dynamics and safety, distributing the drive forces with two superposition stages in continuous variation between the rear wheels, and thus operating even faster and more sensitively than the ESP stabilization system. In faster cornering it literally pushes the A6 Avant into the radius.

The superposition stages comprise two sun gears and an internal gear each. They rotate roughly ten percent faster than the drive shaft. A multi-plate clutch provides the connection between the shaft and the superposition stage.

When the clutch closes, it continuously imposes the higher speed of the superposition stage on the outside wheel. The additional torque required in order to rotate faster is drawn away from the inside wheel via the differential. In this way nearly all of the torque can be directed to one wheel. The maximum difference between the wheels is 1,800 Nm (*1,327.61 lb-ft*).

The sport differential is just as effective while coasting as it is under load. Its control actions occur electronically and ultra-precisely within a hundredth of a second, and are integrated in the Audi drive select dynamic system, so that the driver can switch between different characteristic maps at any time. When the sport differential is on board, the torque vectoring function acts only on the front wheels.

## **Chassis**

The new Audi A6 Avant has a technically highly advanced chassis, providing flexible cushioning like a luxury-class sedan and featuring sporty handling like a coupe. The wheel control arms and many other components are made from lightweight aluminum; the new electromechanical power steering operates with outstanding efficiency. The Audi drive select dynamic system is standard. Options from Audi include adaptive air suspension and dynamic steering, with the latter to become available somewhat later.

### **Innovative layout: the front axle**

The front suspension comprises five links per wheel – two transverse links on the upper plane, the support link and control arm in the lower plane, and the track rod. The suspension can handle longitudinal and lateral forces separately. Its bearings respond smoothly in the longitudinal direction, and are very stiff in the transverse direction for sporty precision. The track measures 1.63 meters (*5.35 ft*), an increase of 15 mm (*0.59 in*) on the previous model.

Lightweight aluminum forged parts serve as axle guides; the wheel carriers and pivot bearings are also made of this material. The tube-shaped stabilizer is also very light in weight. The integral subframe for the engine and the front axle forms the backbone of the suspension. Made of high-tensile steel, it is rigidly bolted to the front end of the car; due to its high rigidity, steering forces are applied without lag.

The electromechanical steering in the A6 Avant, newly developed from the ground up, is placed well down, at the level of the wheel center. The track rod forces are directly introduced, resulting in a nimble response, high precision and sensitive feedback from the road. The steering rack and the servo drive are arranged concentrically, making the layout very compact.

The power assistance depends on the driven speed. The system is extremely efficient. Because it consumes no energy when driving straight ahead, it lowers fuel consumption by as much as 0.3 liters per 100 km depending on the engine. The electromechanical drive allows the steering to work together with the new assistance systems Audi active lane assist and park assist.

The power steering system features a sporty and direct 16.1:1 overall ratio. Despite the longer wheelbase, the turning circle of the new A6 Avant has barely increased relative to the preceding model, amounting to about 11.9 meters (39.04 ft).

### **Comfort and dynamics: the rear axle**

The rear axle of the new Audi A6 Avant, with a track width of 1.62 meters (5.31 ft), follows the track-controlled trapezoidal link principle – a compact design combining excellent comfort and driving qualities. Each axle carrier consists of two longitudinal and transverse tubes created from high-pressure internal forming. Four hydraulic bearings connecting the axle carrier to the body also greatly contribute to the ride comfort.

The two hollow trapezoidal links are elaborately sand-cast from warm-hardened aluminum; the wheel carriers are of chill-cast aluminum. A steel tube serves as a stabilizer. The springs and shock absorbers, structurally separate from one another, rest directly on the wheel carriers. This allowed the development engineers to achieve a high shock absorber ratio – the shock absorbers respond with the utmost sensitivity.

As an alternative to the standard steel suspension, Audi offers a sport suspension that lowers the body by 20 millimeters (0.79 inches). quattro GmbH offers an even stiffer S line sport suspension that lowers the body by an additional 10 millimeters (0.39 inches).

## **Even more bandwidth: Audi drive select**

Audi drive select is standard on the Audi A6 Avant. It modifies the accelerator characteristics, the shift points of the automatic transmission and the power steering boost. The driver can vary the function of these components between the three modes “comfort,” “auto” and “dynamic.” All turbocharged engines additionally offer the “efficiency” mode. The “individual” mode is also available, for compiling the driver’s own favorite profile within certain limits.

The “efficiency” mode supports an especially fuel-efficient driving style. In this case Audi drive select also operates the deluxe automatic air conditioning and the optional adaptive air suspension and ACC stop & go. The adaptive light, the ambient lighting, the Audi pre sense safety system, the sport differential and the dynamic steering are also integrated in Audi drive select as further optional extras.

The dynamic steering, which will become available somewhat later, can vary its gear ratio by nearly 100 percent. It has a compact design and weighs only 2.4 kilograms (*5.29 lb*). Its core is a superposition gear; the harmonic drive was originally developed for robotics and aeronautics. With no play, and little friction, it can precisely transmit enormous torque magnitudes and achieves a very high efficiency.

In urban traffic, especially during maneuvering, the dynamic steering makes the A6 Avant extremely manageable with the system’s very direct gear ratio and high power assistance. On inter-urban roads this directness and power assistance gradually decline with increasing speed, and at high speeds on the freeway an indirect gear ratio and low power assistance promote calm, relaxed straight-ahead driving.

The dynamic steering system works closely together with the ESP stabilization program in the sportiness and safety areas. It countersteers when cornering at the handling limits, if necessary. In most situations, its subtle interventions, which the driver often does not even notice, result in a load change that reduces understeer or oversteer as necessary.

The dynamic steering needs less time for its corrections than the brake system needs to develop pressure at the wheels – in many situations the dynamic steering does most of the work. This increased driving safety and sportiness is particularly noticeable when driving at higher speeds or on a slick substrate.

### **Riding on air: the adaptive air suspension**

Audi optionally installs adaptive air suspension including electronically controlled damping, so that the new A6 Avant will flexibly respond to unevenness of all kinds. Up front are struts in which the pneumatic springs enclose the shock absorbers, while separate pneumatic springs and dampers are used in the rear. The lightweight supercharger operates at high efficiency. The aluminum pressure vessel in the spare wheel well holds 5.8 liters of air at a pressure of 18 bar.

A control unit manages the mode of operation of the CDC shock absorbers (CDC: continuous damping control), depending on the condition of the road, the driver's style and the mode of Audi drive select. Employing numerous data, the computer individually readjusts the damping forces for each wheel in millisecond cycles.

Electromagnetically actuated valves control the flow of the hydraulic fluid between the inner and outer tubes, with the damper characteristics changing as the cross-section becomes larger or smaller.

The adaptive air suspension sets the height of the body at different levels depending on the vehicle speed and the driver's request. In "auto" mode, the body is lowered 20 millimeters (*0.79 in*) once the A6 Avant has driven for at least 30 seconds at a speed greater than 120 km/h (*74.56 mph*). This increases stability and reduces drag. In "dynamic" mode, the body is lowered 10 millimeters (*0.39 in*) from the outset, and is lowered another 10 millimeters when the switchpoint is reached. The body is not lowered at all in "comfort" mode.

The air suspension can also raise the body 20 millimeters (*0.79 in*). The adaptive air suspension also serves as a high-tech level control to keep the body at the ideal ride height at all times, regardless of the cargo load. Passengers always experience the same superior level of comfort.

## **New functions: the ESP stabilization system**

A state-of-the-art control unit manages the ESP stabilization system. The driver can select a sport mode at the MMI. Intervention by the engine is then largely deactivated and braking slightly diminished; up to a certain speed the system allows oversteer that is dynamic and therefore safe at all times, when the vehicle is accelerated. The ESP also integrates a hold assist function for slopes and grades. The brake light operates adaptively; at maximum braking it flashes rapidly to warn the drivers of following vehicles.

Together with the electromechanical steering, the ESP also helps the driver with braking and countersteering on a surface that is slippery on only one side – this feature goes by the name of Driver Steering Recommendation (DSR). At the start of braking a steering pulse indicates to the driver the direction in which to steer if the car is to remain stable; afterwards the steering wheel is power-assisted accordingly.

The front-wheel drive variants of the new Audi A6 Avant bring along a new technology that further increases the car's agility – ESP with electronic limited slip differential. If the control unit detects that the load on the front inside wheel is reduced too much in fast cornering and there is a risk of skidding, it initiates brief, controlled braking of that wheel.

The intervention causes excess torque to flow to the outside wheel. At the same time, the difference between the drive forces generates a certain yaw moment that helps the driver by turning the A6 Avant very slightly into the curve. Self-steering behavior remains neutral longer, and handling becomes more precise, agile and stable.

### **Stable and lightweight: the brakes**

The brake system of the new A6 Avant is designed for maximum performance at low weight. The brake booster consists largely of aluminum. The ventilated disks measure 320, 345 or 356 millimeters (*12.60, 13.58 or 14.02 in*) in diameter up front depending on the engine version and either 300 or 330 millimeters (*11.81 or 12.99 in*) at the rear. The design of the cooling ducts resembles turbine blades – the high rate of exhaust air removal considerably enhances brake performance.

The floating calipers at the front axle differ depending on the engine output. Two-part calipers are used up to the medium category, with the hydraulic part consisting of aluminum and the caliper itself being cast iron. For the top engine versions Audi uses single-part dual-piston calipers, made wholly of aluminum. The electromechanical parking brake integrated in the rear axle calipers is quiet and lightweight.

### **Large and elegant: the alloy wheels**

The large alloy wheels harmonize perfectly with the sporty and elegant line of the new A6 Avant. The 2.0 TDI, the 2.8 FSI and the 3.0 TDI with 150 kW (204 hp) ride on 16-inch wheels with tires of size 225/60. The 3.0 TDI with 180 kW (245 hp), the 3.0 TDI with 230 kW (313 hp) and the 3.0 TFSI feature 17-inch wheels with 225/55 tires.

The line of optional extras comprises 17, 18 and 19 inch wheels; at the top of the line are 20-inch wheels with size 255/35 tires. Audi and quattro GmbH offer extremely attractive designs here – partly polished forged wheels with spoke sides in anthracite or with a machine-polished titanium look. The winter wheels are available as 16-inch, 17-inch or 18-inch versions.

All tires have optimized rolling resistance for the new A6 Avant – at no loss of dynamics or comfort. A tire pressure monitoring display is standard – an indirectly measuring system that records and analyzes the characteristic vibrations of the tires via the ABS sensor system. Also standard is a repair kit, with a space-saving spare tire being optional. Some tires also have run-flat properties.

## Equipment

The new Audi A6 Avant offers the full comfort and equipment level of the luxury class. A wide range of attractive features are already standard.

The deluxe automatic air conditioning, the start-stop button for the engine and the four-spoke leather multifunction steering wheel make driving more relaxed. Also on board are the MMI radio with 6.5 inch monitor, a light and rain sensor, an electromechanical parking brake, the hold assist function, a cruise control system, an acoustically insulated windshield and electrically heated and adjustable exterior mirrors. Front and rear armrests as well as many storage spaces increase the seating comfort; the folding rear backrests are asymmetrically split.

The high-gloss package around the side windows and the elegant 16-inch and 17-inch alloy wheels (depending on the engine version) lend visual highlights to the exterior. A function monitors the air pressure in the tires, while the adaptive brake light warns the drivers of following vehicles in the event of emergency braking. Bright LED turn signals are integrated in the exterior mirror housings.

The comprehensive safety package comprises two front, two side and two head airbags, four belt tensioners, the integral head restraint system, five head restraints and Isofix fixtures in the back for child seats. The Audi pre sense basic system rounds out the safety equipment.

Audi drive select, which comes standard, includes the new “efficiency” mode for all turbocharged engines. The top-of-the-line engine versions in the new A6 Avant apply their power to the road via automatic transmissions and the quattro permanent all-wheel drive. The ESP stabilization program with electronic limited slip differential is standard in the front-wheel drive versions. With all engine versions a start-stop system and a recuperation system help reduce fuel consumption.



### **Like the luxury class: optional extras**

Numerous optional extras make driving in the new Audi A6 Avant even more self-assured and safer. They include the driver information system, the head-up display, four-zone automatic air conditioning with a separate control panel in the rear, auxiliary heating, a broad selection of steering wheels, an anti-theft alarm and sun blinds for the rear.

Other luxurious options are the light package, the convenience key for easy access to the vehicle, the electric door power latching feature, the electrically folding exterior mirrors, the garage door opener and the automatically dimming interior mirror. Audi also offers optional insulating/acoustic glazing – tinted upon request – and a two-part panoramic glass roof.

The seat versions are also extremely versatile – they range from the electric lumbar support and sport seats to comfort seats, with ventilation and a massage feature on request. Side airbags for the rear seats and a storage package are optionally available. The convenience key including sensor-controlled tailgate release, an electric roller blind and many other practical equipment items make loading the car even more convenient.

Audi has prepared a large number of special solutions for those who appreciate the exceptional: a leather package, refined upholsteries and inlays, and an S line sport package that drapes the interior in black. The package includes a sport suspension, 18-inch or 19-inch wheels, sport seats, a special leather steering wheel and other details in the interior. As an addition, the S line exterior package makes the outside of the A6 Avant look even more dynamic. Other customization features, for example from the Audi exclusive line, are in preparation.

For especially dynamic drivers, Audi offers two sport suspension systems. The sport differential perfectly complements the quattro drive, with automatic transmissions available for several versions. Shift paddles at the steering wheel make handling the transmission even sportier. The adaptive air suspension combines smooth ride comfort with sporty dynamics. The selection of wheel options ranges up to 20 inches with size 255/35 tires.

Lighting technology is a particular Audi strength. The adaptive light with variable headlight range control is available as an option for the A6 Avant with xenon plus headlights. At the top of the line are the LED headlights. In combination with them and the xenon plus headlights, Audi also offers LED tail lights.

### **A wide range: the driver assistance systems**

The range of driver assistance systems is particularly broad. Its core is adaptive cruise control with stop & go function, including Audi pre sense front – a high-end radar cruise control system together with a warning feature. Audi side assist, including Audi pre sense rear, monitors traffic to the rear of the vehicle and assists the driver when changing lanes.

Audi active lane assist facilitates staying in the lane, the speed limit display recognizes important traffic signs, and the night vision assistant with highlighting of detected pedestrians can see far ahead into the dark. For convenient parking, Audi offers various options, including the Audi parking system plus with 360° camera, to become available somewhat later. The assistance package, including Audi pre sense plus, comprises the most important systems.

The new A6 Avant has also overtaken its rivals by far when it comes to infotainment and Internet connection technology. Audi offers many state-of-the-art optional elements, ranging up to MMI touch with its groundbreaking touchpad operation and to the Advanced Sound System from Bang & Olufsen. The Bluetooth online car phone connects the passengers to the Internet via UMTS and a Wi-Fi hotspot. The innovative services under the keyword “connect” also include the Audi online traffic information and the Google POI search.

The Audi A6 Avant will begin arriving in showrooms in key European markets in the fall. Its base price is 40,850 euros.