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Even more attractive, powerful and efficient – The new Audi A7 Sportback

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Summary

The new Audi A7 Sportback

Audi has devoted tremendous effort to updating its A7 Sportback. The spacious five-door coupe is now even more powerful and attractive – thanks to new engine configurations, new headlights, taillights and new infotainment systems. The new A7 Sportback combines the emotional appeal and sportiness of a coupe with the comfort of a sedan and the functional benefits of an Avant.

When the A7 Sportback debuted in 2010, Audi set new standards in automotive design, embracing an athletic aesthetic and elegance in grand style. Its long bonnet, sporty, flowing C-pillars and the sharply dropping rear-end create a dynamic overall impression. The revised version of the five-door model, measuring 4.97 metres in length, now has additional striking, sporty features.

The most striking changes are to the Singleframe grille, bumpers, exhaust tips and headlights. Audi supplies either LED technology or Matrix LED headlights, which light the road optimally without dazzling other road users. Combined with the Matrix LED headlights, dynamic turn signals are also installed at the front; they come standard at the rear.

The body of the new Audi A7 Sportback consists primarily of aluminium and high-tech steel grades. It is extraordinarily lightweight and designed for maximum comfort in terms of noise. The cargo space under the long, electrically driven boot lid has a base capacity of 535 litres. When the rear seat backs are folded down, it grows to 1,390 litres.

The sporty style of the exterior is echoed in the car's interior. The dominant element is the horizontal line surrounding the driver and passenger. The dashboard gives an impression of lightness and elegance.

The new interior materials, including the aluminium/Beaufort walnut inlay and Valcona leather, are impressive for their finish. The colour palette has been redesigned, offering five colour options even for the seats.

The new Audi A7 Sportback is confident and relaxed to drive. The front seats can be optionally equipped with ventilation and massage functions, and there are three seat versions to choose from.

Power and efficiency: two TDI engines

Audi is offering the new A7 Sportback with a choice of two powerful and highly efficient TDI engines. With outputs of 160kW and 235kW, both of them comply with the Euro 6 emission standard. The three-litre 160kW V6 uses an average of just 5.2 litres of fuel per 100km, corresponding to CO₂ emissions of 136 grams per kilometre. The top-of-the-line 4.0 TFSI is available in the Audi S7 Sportback, delivering 331kW. It features innovative cylinder on demand technology (COD).

The 3.0 TDI Biturbo clean diesel, which delivers 235kW, works with an eight-speed tiptronic transmission. All other engine configurations have a seven-speed S tronic transmission. quattro permanent all-wheel drive is fitted as standard, and can be supplemented with the sport differential, which actively distributes power between the rear wheels.

The chassis, too, combines sporty precision with high comfort. The new Audi A7 Sportback features wheels with diameters ranging from 19 to 21 inches. Some engine configurations are equipped with new lightweight brakes. The power steering features an electromechanical drive for high efficiency. The Audi drive select dynamic handling system is standard.

Options include dynamic steering, sport suspension and adaptive air suspension. On the S7 Sportback, the air suspension has a firmer setup.

The new Audi A7 Sportback leads the competition in terms of infotainment. MMI navigation plus with MMI touch boasts the latest generation of the modular infotainment system; its highlight is a powerful graphics processor from Audi's partner Nvidia. Touchpad control lets the driver scroll and zoom in lists and maps.

The perfect supplement to MMI navigation plus is Audi connect, which links the five-door coupe with the Internet via the LTE high-speed data

transmission. The top of the hi-fi line is the Bang & Olufsen Advanced Sound System.

The assistance systems – including adaptive cruise control with stop & go function, the further improved night vision assistant and the Audi pre sense safety system – are also state of the art. Audi side assist and Audi active lane assist work closely together to make lane changes even safer.

At a glance:

The new Audi A7 Sportback

Design and body

- Redesigned bumpers, Singleframe grille and headlights
- New LED headlights and also now Matrix LED headlights, dynamic turn signals standard at the rear, also at the front together with Matrix LED headlights
- Electrically operated boot lid; variable rear seats
- Lightweight body with high percentage of aluminium and high-strength steels

Interior and controls

- Elegant design, premium workmanship, new colours and materials
- Ventilation and massage function optional for front seats
- Head-up display available as an option

Drivetrain

- Two TDI engines, power outputs of 160kW or 235kW; both engines comply with Euro 6 emission standard
- Audi S7 Sportback with 4.0 TFSI; power output of 331kW
- - Seven-speed S tronic for 3.0 TDI and S7; 3.0 TDI Biturbo with tiptronic
- Sport differential optional on 3.0 TDI models, standard on S7

Chassis

- Electromechanical power steering, dynamic steering optional
- Wheels measuring 19 to 21 inches in diameter, brakes, in some cases with new aluminium fixed calipers
- Audi drive select (dynamic handling system) is standard; dynamic steering, adaptive air suspension and sport suspension are optional

Equipment packages

- MMI navigation plus with NVIDIA graphics processor and high-resolution eight-inch screen
- Audi connect with LTE modem
- Optional Bang & Olufsen Advanced Sound System
- Cutting-edge safety and assistance systems, Audi side assist and Audi active lane assist as standard equipment

Full version

Even more attractive, powerful and efficient – The new Audi A7 Sportback

The Audi A7 Sportback has been thoroughly revised. This large, five-door coupe boasts enhanced technology and even better performance in a number of areas – engines, headlights and infotainment.

Exterior design

The new Audi A7 Sportback is longer by five millimetres. It is 4,974 millimetres long, 1,911 millimetres wide, 1,420 millimetres high and has a wheelbase of 2,914 millimetres. The five-door coupe is a dynamic sculpture with harmonic proportions.

The front end is long; the roofline low and athletically taut. The C-pillar flows assertively toward the rear and into the body's shoulder line. The tornado line divides up the side panel beneath the windows and gives the body powerful shoulders. Above the redesigned, visually taut sill trims is the dynamic line, which runs slightly upward. The large, precisely rendered wheel arches emphasise the muscular character of the new Audi A7 Sportback.

The Singleframe grille at the front now appears even wider. Its six corners are now crisper; eight chrome struts add emphasis to the horizontal dimension. The air inlets in the bumper, which has also been redesigned, are interconnected below the Singleframe. Powerful edges at the top offset the inlets, which feature two crossbars each in the middle.

Wedge-shaped headlights featuring a wave-shaped lower edge likewise exhibit a new look that matches the modified Singleframe grille. Audi supplies these headlights with energy-efficient LED technology as standard. The low beams consist of 12 LED chips that supply light via three reflectors. An additional six LED chips paired with two reflectors generate the high beams.

The LED light strip is over a metre in length and consists of 25 diodes. Thanks to superposed, thick-wall technology, these diodes form a homogeneous strip of light. The lights come on as soon as the ignition is switched on, without the driver having to do anything. High-beam assist is standard.

Highly innovative: Matrix LED headlights

Upon request, Audi will supply Matrix LED headlights for the new A7 Sportback. A bundle of 19 light-emitting diodes per headlight paired with four reflectors produce high-beam light. Matrix LED headlights ideally illuminate the road ahead without dazzling oncoming vehicles or vehicles ahead. As needed, a control unit networked with a video camera mounted on the rearview mirror switches individual diodes on and off, and dims them in one of 64 different settings for each diode.

The Matrix LED headlights are paired with the intelligent cornering light, created by a shift in the light centre position. If the car is equipped with the optional MMI navigation plus, then this system's route data will trigger the cornering light to illuminate around the corner just before the driver even turns the steering wheel.

In conjunction with the Matrix LED headlights, Audi supplies new dynamic turn signals for the front of the new A7 Sportback. When the driver engages the turn signal, its 13 LEDs light up sequentially from the inside out.

The taillights of the new Audi A7 Sportback likewise consist entirely of light-emitting diodes. Dynamic turn signals are standard at the rear.

Typical sports car: the rear

The rear of the new Audi A7 Sportback boldly underscores the vehicle's dynamic personality. Reminiscent of a classic sports car, the rear end is truncated and indented. Along the upper edge of the rear window, a flat LED light strip serves as a third brake light. The spoiler in the long boot lid automatically extends at a speed of 130km/h and retracts at 80km/h.

All surfaces are intensively sculpted – particularly the tailgate and the redesigned bumper. The latter's broad, black diffuser insert encloses the

two tail pipes of the dual-branch exhaust system on the left and right. The exhaust tips have been designed flat and trapezoidal, underscoring the width of this five-door coupe.

Audi offers 13 different paint finishes for the A7 Sportback; six of them are new colours. The two solid finishes are called ibis white and brilliant black. The 10 metallic finishes are cuvée silver, Dakota grey, florett silver, glacier white, Havana black, carat beige, Oolong grey, moonlight blue, mythos black and tornado grey. The pearl effect colour garnet red completes the range of paint finishes. Customers can also specify a colour of their choice for a customised paint finish.

The standard S line exterior package gives the A7 Sportback even greater sporty individuality. The bumpers are more striking. The air inlets are kept separate, the rear diffuser has a black honeycomb grille and its spoiler edge is finished in platinum grey. The fenders bear S line logos and the sill trims feature pronounced contours.

Body

Thanks to its aluminium hybrid construction, the body of the new A7 Sportback weighs some 15 percent less than a comparable body made entirely of steel. This explains the low weight of this large five-door coupe. An unladen A7 Sportback 3.0 TDI (no driver) weighs 1,825 kilograms.

More than 20 percent of the body is made of aluminium. Lightweight aluminium sections serve as struts in the engine compartment and as cross-members behind the front and rear bumpers. The strut domes at the front end and the mounting bracket for the upper trailing arms are made of die-cast aluminium. Each dome weighs some four kilograms less than a comparable steel component. The front fenders, bonnet, long boot lid, doors and integral member behind the instrument panel all consist of sheet aluminium.

At Audi, the principle of lightweight design means using the right material in the right place to achieve optimum function. The body of the new A7 Sportback therefore incorporates a large number of high-end steels in different strength classes. The strongest of these are hot-shaped steels. A radical increase in temperature during shaping gives them their extremely

high strength. They require relatively thin wall thickness and are accordingly lightweight.

Hot-shaped steels constitute a robust backbone for the passenger cell of the new Audi A7 Sportback. Audi also uses tailored blanks in many areas. These are panels of various thicknesses that are thicker and stronger in areas subjected to higher loads.

This vehicle's body has other strengths as well. It achieves best-in-class figures for static and dynamic torsional rigidity, thus providing the basis for excellent quality of manufacture, sporty and precise handling, and a quiet ride. Hydraulic elements minimise vibrations of the wheel suspensions, rear subframe and engine. Safety films in the windshield and front windows promote superb noise comfort; there are also three sealing strips per door. As an option, Audi will also fit the A7 Sportback with insulating/acoustic glass and tinted privacy windows.

In a frontal collision, the front cross-member distributes the forces to the two side members, which undergo defined deformation to dissipate these forces. The support for the engine and front axle acts as an additional impact buffer by diverting forces in a controlled manner into the strong floor and tunnel structure of the occupant cell. The cell itself provides a high level of protection thanks to the hot-shaped steel components.

In the interior, the Audi adaptive restraint system provides excellent protection through the precisely co-ordinated interaction of its components and networking with the Audi pre sense safety system. The adaptive restraint system comprises two airbags at the front, two in the backrests of the front seats and rear, two in the roof frame, the Audi integral head restraint system and the power belt force limiters for the front seats. ISOFIX child-seat anchor points in the rear are also standard.

The base version of the new Audi A7 Sportback achieves a drag coefficient of 0.28 and has a frontal area of 2.29m². Its paneled underbody, which protects the vehicle against moisture and stone impact, results in only negligible aerodynamic drag. Loss of airflow through the engine compartment is also kept to a minimum.

Engines

Rightsizing is essential in the new A7 Sportback, for which Audi has created a new engine lineup. There are two 3.0 TDI versions, with power outputs of 160kW and 235kW. The top-of-the-line 4.0 TFSI is also available in the Audi S7 Sportback, delivering 331kW. It features the innovative cylinder on demand technology (COD). These engines not only have grown more powerful; their fuel consumption has dropped by as much as 10 percent as well. All engines comply with the Euro 6 emission standard.

One standard feature in the new Audi A7 Sportback is the overhauled start-stop system which switches off the engine as soon as the driver brakes at speeds below 7km/h. The start-stop system is inactive whenever the transmission is in S mode or in the manual shift gate.

Two three-litre V6 TDI engines

The 3.0 TDI under the bonnet of the new A7 Sportback satisfies all requirements. Audi offers the V6, which also has a 90-degree cylinder bank angle and a displacement of 2,967cm³ (bore x stroke 83.0 x 91.4 millimetres), as an extensively modified single-turbo configuration, and as a Biturbo unit. The single-turbo TDI weighs less than 192 kilograms. Its crankcase made of high-strength vermicular-graphite cast iron is even lighter than before.

Audi's new V6 TDI boasts high-end solutions in all fields of technology. The pistons are cooled by means of oil in a cast-in duct. Their rings and pins have been optimised to minimise friction. The crankcase and the all-new cylinder heads have separate coolant circuits, and are part of the optimised innovative thermal management system. The cylinder heads' cooling jackets are divided into an upper section and a lower section to reduce pressure losses. The turbocharger and the exhaust-gas treatment system have likewise been overhauled. The oil pump is fully variable. Particularly lightweight hollow shafts serve as camshafts. The common rail injection system develops a system pressure of 2,000 bar. The compression ratio is 16.0:1.

Thanks to an emissions-control unit compliant with the Euro 6 emissions standard, all versions of the 3.0 TDI bear the 'clean diesel' designation. Their components are integrated within the engine package due to the proximity of the exhaust-gas treatment system to the engine. A larger catalytic

converter with oxygen sensor is downstream of the turbocharger's turbine outlet. Immediately downstream lies a diesel particulate filter. The inner lining of its filters has a coating that removes nitrogen oxides from exhaust emissions as per selective catalytic reduction (SCR). A metering module injects AdBlue, an additive.

The reconfiguration of emissions-control components necessitated, among other things, modifications to the chain drive, exhaust-gas turbocharger and cylinder heads. The oil/vacuum pump has been fitted with a drive of its own. Intermediate wheels with gearwheel stages have replaced the camshafts' large sprocket wheels.

The 3.0 TDI single-turbo engine delivers 160kW and develops 500Nm of torque between 1,250 and 3,000rpm. Other key figures are every bit as impressive. Equipped with quattro drive, the engine propels the vehicle from 0 to 100km/h in 6.8 seconds and on up to a top speed of 239km/h. It needs just 5.2 litres of fuel per 100km, corresponding to 136 grams of CO₂ per km.

Topping the diesel engine lineup is the new 3.0 TDI with Biturbo technology and 235kW. It accelerates the five-door coupe from zero to 100km/h in 5.2 seconds on the way to an electronically governed top speed of 250km/h. Average fuel consumption is just 6.1 litres per 100km, which equates to 162 g CO₂ per km. The Biturbo TDI is also paired with quattro permanent all-wheel drive.

A sound actuator in the exhaust system gives this diesel engine a rich, resonant sound reminiscent of an eight-cylinder unit. A valve connects the two in-series turbochargers. At low revs it is closed. The small charger with its variable turbine geometry does most of the work, and the large charger is responsible for the pre-compression. From about 2,500rpm, the valve starts to open and the small charger increasingly transfers the major share of work to its counterpart. Between 3,500 and 4,000rpm, the valve opens completely, and only the large charger still operates.

Drivetrain

Audi offers two transmission technologies for the new A7 Sportback: the tiptronic and the seven-speed S tronic. Both transmissions are integrated in the engine's thermal management system, achieve high efficiency ratios and interact ideally with the start-stop systems. Their lower gears feature short,

sporty ratios, while the upper gears are long to reduce revs and fuel consumption.

Two automatic modes, D and S, are at the driver's disposal. In manual mode, the driver can change gears using the shift knob or shift paddles on the steering wheel.

The Biturbo TDI is paired with an eight-speed tiptronic. This classic torque-converter transmission offers shifting that is smooth, spontaneous, speedy and supple. Its torque-converter lockup clutch connects the transmission directly to the engine under standard driving conditions. It works with limited slip in certain situations, which permits very low engine speeds in interplay with the integrated shock absorber, without the occurrence of vibrations. Whenever the new A7 Sportback comes to a stop, the clutch disengages the transmission from the engine.

A similar principle applies to the seven-speed S tronic. Its two multi-plate clutches operate two mutually independent sub-transmissions, which are essentially similar in nature to manual transmissions.

Both sub-transmissions 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 sub-transmission. 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 practically no interruption of traction. It is so fluid and smooth that it is hardly noticeable. When the standard Audi drive select system is in efficiency mode, the S tronic begins to freewheel as soon as the driver takes his or her foot off the accelerator.

New solutions: oil supply

A clever approach to lubrication boosts the efficiency of the new seven-speed S tronic considerably. Dry-sump technology supplies oil to the wheel sets. A centrifugal pump generating just 0.1 bar and consuming very little electrical operating energy supplies oil to a shallow pan at the top of the wheel set. This pan in turn lubricates the gearing and bearings of the wheel set and the differential via multiple bores.

With respect to operating the dual clutch and the hydraulic gear actuator, the conventional mechanical oil pump has been superseded by an electric-powered tandem gear pump. The latter consists of a high-pressure pump with a flow rate of 0.8cm³ and maximum pressure of 28 bar as well as a low-pressure pump with a flow rate of 5.5cm³.

The electrical gear pump always supplies just the right amount of oil in any given situation. This pump is typically deactivated at steady highway speeds, as the corresponding oil pressure and a gas-pressure accumulator suffice to supply the oil needed to lubricate the transmission and clutch. Even when the start-stop system turns the engine off as soon as the vehicle comes to a stop, the accumulator ensures the transmission will continue to function.

A reduction in power loss played a key role during development of the new seven-speed S tronic. An angular-contact ball bearing is used for the highly loaded bearing assembly of the pinion top. Audi engineers avoid relying wherever possible on conventional pre-loaded taper roller bearings in order to reduce drag torque. Leakage is very low throughout the transmission. Hollow shafts – some of whose bores supply oil – and split gear wheels result in a lower weight.

Thanks to this attention to even the smallest details, the new seven-speed S tronic is noted for its outstanding efficiency ratio. At just 100Nm of torque, this ratio is at 94 percent. As load increases, so too does the efficiency – making it far more efficient than the competition's automatic transmissions. The new dual-clutch transmission provides a very broad spread of gear ratios: from 7.4 to 8.4.

Purely mechanical and lightning-fast: quattro permanent all-wheel drive
The quattro permanent all-wheel drive system also ensures superior dynamics, traction and stability in the new Audi A7 Sportback. This is a purely mechanical system without any lag. Its principal component is a self-locking centre differential. Under typical driving conditions, the planetary gear distributes 40 percent of the engine's power to the front axle and 60 percent to the rear axle. Before problematic wheel slippage can occur, most of the power is transferred to the axle with better traction. Up to 70 percent can flow to the front wheels and up to 85 percent to the rear wheels.

The self-locking centre differential operates in tight tandem with torque vectoring, an intelligent software feature of the Electronic Stabilisation Control (ESC) system. Upon detecting that the front inside wheel (both inside wheels on quattro models) in a turn has been relieved too much, the ESC unit gently and precisely brakes the wheel concerned. The intervention causes excess torque to flow to the outside wheel. Thanks to the difference in propulsive forces, the five-door coupe turns very easily into the curve, which is helpful for the driver. Self-steering behavior remains neutral longer, and handling becomes more precise, agile and stable.

The quattro drivetrain can be combined with the sport differential. The sport differential is an extension of the conventional rear differential. Torque is provided to one side or the other via additional gear steps and the hydraulic multi-plate clutch on a given side. Active torque distribution prevents unwanted understeering or oversteering. The sport differential function has been further improved significantly for the A7 Sportback. Torque distribution is even faster and even more responsive than ever before whenever the driver steers or accelerates in a curve. As usual, the driver can use Audi drive select to switch between various sport differential modes to suit his or her preference.

Chassis

The ride comfort of a luxury sedan paired with the sporty handling of a coupe: The chassis of the new Audi A7 Sportback is truly impressive. The suspension control arms are aluminium forgings, which keeps the unsprung masses low. The wheel carriers and pivot bearings are likewise made of aluminium. The anti-roll bars are lightweight tubes.

The front axle, which has a track width of 1,644mm is a five-link design that can handle longitudinal and lateral forces separately. Its bearings are sportily stiff in the lateral direction, and supple and soft in the longitudinal direction. A subframe, on which the engine is also supported, serves as the backbone of the front axle. This is rigidly bolted to the front end of the car; due to its high rigidity, steering forces are applied without lag.

The rear axle of the new Audi A7 Sportback (track: 1,635 mm) observes the track-controlled trapezoidal link principle. This compact design allows for excellent comfort and handling. Both hollow trapezoidal links and the wheel

carriers are made of cast aluminium; the transverse links and track rods are aluminium forgings.

The steering box is very compact and features a highly efficient electro-mechanical drive. Thanks to a steering ratio of 15.9:1, steering is sportily direct; power-steering assistance varies precisely in accordance with the vehicle's speed. The electromechanical power steering combines highly precise feedback from the road with low sensitivity to rough roadways.

This power steering is the foundation for Audi active lane assist and the park assist system. Audi drive select allows the driver to tailor steering from comfortable to sporty.

The new A7 Sportback comes as standard with a sportily balanced steel chassis. Upon request, Audi will supply sport suspension that lowers the vehicle body by 10 millimetres

Versatile: adaptive air suspension

Audi offers its adaptive air suspension to customers particularly interested in ride comfort. Featuring electronically controlled damping, this technology raises or lowers the body depending on vehicle speed and the driver's preference.

Audi drive select allows the driver to switch among three modes: auto, comfort and dynamic. At speeds above 120km/h, the adaptive air suspension will lower the body by 10 millimetres. On uneven driving surfaces, it can raise the body by 20 millimetres. The air suspension also functions as a self-leveling suspension: it keeps the body at the ideal height regardless of the load situation.

Struts are mounted on the front axle of the new Audi A7 Sportback; pneumatic springs enclose the twin-tube shock absorbers. On the rear axle, pneumatic springs and shock absorbers are separate from one another.

CDC (Continuous Damping Control) shock absorbers ideally complement the pneumatic springs. A control unit adjusts the shock absorbers on a wheel-by-wheel basis within milliseconds. Electromagnetically actuated valves control the flow of hydraulic fluid through the shock-absorber piston.

Standard: the Audi drive select system

The Audi drive select system comes standard on the new Audi A7 Sportback. It allows the driver to adjust the automatic transmission, power steering, engine management and the Audi pre sense basic safety system in various modes: comfort, auto, dynamic, efficiency and individual. There are also optional solutions such as the adaptive air suspension, adaptive cruise control and the sport differential.

Another system integrated within Audi drive select is dynamic steering. Consisting of a superimposed gear mechanism integrated in the steering column and driven by an electric motor, dynamic steering varies the steering ratio by nearly 100 percent depending on steering-wheel angle, vehicle speed and Audi drive select settings. The entire component is compact, lightweight and very efficient.

With a very direct steering ratio and substantial power assistance, dynamic steering makes it easy to drive the new Audi A7 Sportback in cities. On rural roads, directness and tailored steering assistance provide great agility. At highway speeds, an indirect gear ratio and low power assistance promote calm straight-ahead driving. At the vehicle's cornering limits, dynamic steering minimises oversteer and understeer by making subtle adjustments as necessary.

With regard to the brake system in the new Audi A7 Sportback, development engineers focused on low weight and maximum performance. The brake servo is made of aluminium. An electric parking brake is integrated at the rear axle; it also functions as an emergency brake.

For the 3.0 TDI Biturbo, there is an all-new brake system with aluminium fixed calipers at the front wheels. This weighs three kilograms less than the previous system.

Electronic Stabilisation Control (ESC) has also been enhanced in many regards. The vastly improved torque vectoring, in particular, provides for even more precise cornering. Together with the electromechanical power steering, the system also helps the driver with countersteering and braking on a lane that is slippery on only one side. Activating sport mode will largely

deactivate engine intervention and somewhat minimise braking intervention.

Audi and quattro GmbH offer a broad range of alloy wheels for the new A7 Sportback. 7 of the 12 versions are new. Wheels are available in diameters of 19 or 20 inches. 9 J x 21 wheels are the top-of-the-line option. They come in a 5-arm rotor design, in a classic look or matt titanium.

All tyres for the new Audi A7 Sportback have been optimised for rolling resistance; an ultra-compact spare wheel is fitted as standard.

Interior

The interior of the new A7 Sportback mirrors the sporty exterior. Its salient element is the 'wrap-around' – the horizontal line that begins in the doors and forms a large arc underneath the windshield. The instrument panel has a wavy flowing front and the center console is angled toward the driver.

The interior finish demonstrates the great attention to detail that Audi is known for. Materials have been selected and processed with the utmost care. The air vents' thumbwheels and the buttons on the MMI operating interface, for example, feature an exclusive aluminium look. The start-stop button and the shift gate feature discreet red backlighting. The selector lever with its almost spherical knob now has the control button at the front. The quattro badge above the glove box has also been redesigned.

New colour and trim

Audi designers have created attractive new colours and materials for the interior of this five-door coupe. Milano leather upholstery is standard. Valcona leather is an option for the sports seats and customised contour seats. The S sport seats in the S7 are upholstered in particularly high-grade Valcona leather.

Leather trim alone is available in five colours. Audi design selection cedar brown includes upholstery with contrasting stitching, black door trims and aluminium/Beaufort walnut inlays. Several leather packages and the Audi exclusive range, including colour seat belts, round out the offerings.

The standard lighting package add small highlights in the interior in the dark. The ambient lighting package uses LEDs and light guides to create an extremely effective atmosphere – the centre tunnel console appears to float and the door sill trims are illuminated.

The new Audi A7 Sportback's interior is characterised in large part by extensive inlays in the doors, on the instrument panel and on the centre tunnel console. Walnut dark brown inlays are standard here. Options include aluminium Delta silver, black piano finish, fine grain ash natural brown, Beaufort walnut and aluminium/Beaufort black. In the case of the Beaufort inlays, different materials are sliced extremely thin and laid atop one another.

The S line sport package immerses the interior entirely in black. The sport seats are covered in perforated leather. Contrasting stitching provides an eye-catching highlight and S line embossing adorns the backrests of the front seats. The inlays are in matt brushed aluminium; S line badges sparkle on the door sill trims and the specially designed steering wheel, while the selector lever knob is covered in perforated leather.

The utmost in comfort: the seats

There is a choice of four types of front seats for the new A7 Sportback. The standard seats can be electrically adjusted with four-way lumbar support. Upon request, Audi will provide upgrades such as three-speed ventilation and multiple-setting seat heating.

The optional customised contour seats feature 18-way adjustment with memory function. The backrests, side bolsters and lumbar support can be adjusted pneumatically. The massage function, a further option, allows the user to select from five different intensities in five different programs to have 10 air chambers massage their back. The sport seats in the new Audi A7 Sportback have pronounced side sections, removable cushions and electric lumbar supports. The S sport seats in the new S7 Sportback provide even greater stability and have integrated head restraints.

Operating the new Audi A7 Sportback is straightforward and intuitive. The large dials can be read at a glance. The driver information system measures seven inches diagonally and features a colour screen.

The driver information system is operated via the standard multifunction steering wheel. The three-spoke steering wheel with shift paddles are standard. The MMI terminal – a clearly organised operating interface – is positioned on the centre console. The on-board MMI monitor (eight inches diagonally) automatically emerges from the instrument panel when the system is turned on. When not in use, only its chrome-plated upper edge is visible.

The standard four-zone automatic air conditioning is among the strengths of the new Audi A7 Sportback and includes individual controls for rear-seat passengers. Three different modes – low, medium and high – can be selected throughout the vehicle.

Well-informed: the head-up display

Another highlight among the controls is the optional head-up display, which projects key information onto the windscreen in the form of symbols and numbers. A TFT display backlit by a white LED generates the colour image; two aspherical mirrors enlarge and redirect it. The mirrors also compensate for any distortion caused by the curvature of the windscreen.

Information appears to hover in a window in front of the windscreen. Data is projected some 2.3 metres in front of the driver. To avoid ghost images, the windscreen and its noise-damping safety film have a special shape. The driver can process images very quickly because his or her eyes, accustomed to distance vision while driving, do not have to adjust. The driver can use the MMI to specify which information should be shown in the head-up display; the height and brightness can also be adjusted.

The new Audi A7 Sportback rolls off the assembly line as a five-seater; the rear can be fitted with 2 seats as an option (four-seater). Thanks to long and high door cutouts, all passengers can get in and out easily. Stepless door stays keep the doors open; power-assisted closing is optional. Even tall adults have plenty of room in the rear.

Underneath the tailgate, which rises high up into the roof of this five-door coupe, is a large boot lined with fine carpeting. The cargo area offers a base capacity of 535 litres, which can be increased to 1,390 litres by folding down the split rear seat backs. A two-part cover, bag hooks, lashing eyes and a

compartment in the right panel are all very practical in day-to-day use. Options include a reversible mat, a load-through hatch including ski bag and a luggage net.

Thanks to a standard electric drive unit, opening and closing the rear hatch is extremely convenient. The opening angle can be programmed. It can be opened via the remote control key or by pressing a button on the lid. The convenience key offers two additional features. The driver needs merely to press a second, new button before closing the rear hatch to lock the entire car. The driver can also open the tailgate with a kicking motion.

Infotainment and Audi connect

Audi offers an advanced infotainment system for the new A7 Sportback. MMI navigation plus exploits the synergetic computing power of the Audi modular infotainment platform (MIB). It consists of two units in a small space: the Radio Car Control Unit for the triple tuner and sound system as well as the MMX board (MMX: Multi-Media eXtension). The plug-in module integrates – along with the working and flash memory – a Tegra 30 processor from Nvidia. The latter is responsible for all media, voice control, navigation and telephone features.

Lightning-fast: the Tegra 30 processor for graphics

The second-generation modular infotainment platform in the new Audi A7 Sportback boasts a cutting-edge Tegra 30 processor. This quad-core chip boasts more than a GHz of clock frequency and performs some eight billion computations per second. It works together with a specialised 3D graphics program that generates sophisticated animations and images. MMI navigation plus also comprises a DVD drive, two card readers, a Bluetooth interface, the Audi Music Interface with two USB ports, and a 64-GB flash-memory drive.

Another highlight of this system is the MMI touch. This touchpad has been improved once more for easy scrolling in maps and menus. The driver writes letters and numbers on the screen with his or her finger to enter a destination or telephone number.

The system provides acoustic feedback after each character so that the driver's eyes can stay on the road. The user needs to enter just a few letters before a destination is suggested, rather like when using a Google search

engine. The push of a button transforms the MMI touch into a field with six radio stations.

MMI navigation plus in the new Audi A7 Sportback also offers classic Audi controls: the MMI rotary pushbutton as well as the adjacent hard and soft keys. Finally, the system also features voice control that allows a town and street to be entered as a spoken command.

The customer can download and update navigation data five times free of charge within the first three years.

Another very practical feature is combined with the MMI navigation plus in the new Audi A7 Sportback. In addition to the map on the MMI monitor, there is a second colour map displayed between the tachometer and the speedometer in the instrument cluster. This map is therefore always in the driver's direct field of vision.

High-speed Internet: Audi connect

The MMI navigation plus system is made even more attractive with the supplementary system Audi connect, a data transmission module that establishes a connection to the Internet. Whenever possible, it provides Internet access via the fast 4G standard LTE. Audi was the first manufacturer to incorporate this technology into the car. Passengers in the new Audi A7 Sportback can surf and email using the WiFi hotspot that comes with the module – on as many as eight mobile devices.

Audi connect also provides tailored Internet services for the driver, like Google Earth.

The antenna of the new A7 Sportback ensures that Audi connect provides optimal connectivity to mobile communications networks. Encryption via the WPA2 standard makes Wi-Fi data transmission secure. A digital speech processor delivers excellent hands-free call quality, transmitting voice signals via the car's sound system. All the driver needs to do to use Audi connect is insert a data-capable SIM card in the MMI navigation plus or establish the connection using the SIM Access Profile of a compatible smartphone.

Supplementary components round out the multimedia portfolio in the new Audi A7 Sportback. These include a tuner for Digital Audio Broadcasting (DAB) and a USB port for charging smartphones – both fitted as standard. The Bose surround sound system integrates a 12-channel amplifier with an output of over 600 watts and boasts 14 loudspeakers.

Especially discerning hi-fi aficionados will appreciate the Bang & Olufsen Advanced Sound System, delivering more than 1,200 watts. Its digital amplifier delivers sound via 15 channels to 15 loudspeakers housed in polished aluminium.

Driver assistance systems

The driver assistance systems in the new Audi A7 Sportback make driving even more relaxed and assured. There is something to suit every desire. The driver information system offers the rest recommendation feature, which recognises when the driver starts to tire based primarily on steering motions.

Among the optional systems, adaptive cruise control with stop & go function including Audi pre sense front is the most complex. It regulates the speed and the distance of this five-door coupe to the vehicle ahead by accelerating and braking in a range from 0 to 250km/h while also braking automatically within certain limits. The driver can use Audi drive select to switch between four settings to specify just how comfortable or sporty the system should be.

The ACC stop & go function uses data from two radar sensors, a video camera, ultrasound sensors and many additional systems. In city traffic, the ACC stop & go automatically slows the car to a stop.

Audi side assist including Audi pre sense rear is activated at 30km/h. Two radar sensors at the rear monitor what goes on behind the new A7 Sportback. If another vehicle moves into the critical zone from behind, a yellow LED display lights up in the housing of the exterior mirror. If the driver nevertheless activates the turn signal to change lanes, the indicator becomes bright and begins to flash quickly – a signal that is hard to miss.

Audi active lane assist employs a video camera to detect lane markings at speeds above 65km/h. If the new A7 Sportback approaches a lane marking

without the turn signal being activated, the system helps the driver to steer back into the lane by intervening gently in the electromechanical power steering. Drivers use the MMI to specify how quickly this assistance system should intervene and whether the steering wheel should vibrate as well. If the driver selects early intervention, the system helps to keep the car in the center of the lane.

Networked: now even safer to change lanes

Audi active lane assist and Audi side assist work closely together in the new A7 Sportback. When both are activated, they will warn the driver of a critical lane change – because another vehicle is in a blind spot, for instance – and initiate corrective steering intervention.

Another high-end system in the new Audi A7 Sportback is the night vision assistant. Its thermal imaging camera uses far infrared technology to ‘see’ up to 300 metres ahead. Data is converted into black-and-white images that are displayed on the large driver information system screen. People and animals appear conspicuously bright on the screen due to the heat they give off, whereas the cooler surroundings appear dark. The software can detect people and large animals some 100 metres away and highlights them in the display in yellow.

If the computer detects a hazardous situation, the brake system is preemptively pre-filled. A warning chime will sound and a red warning will appear on the driver information system’s screen and in the optional head-up display. If the A7 Sportback is equipped with high-beam assist or Matrix LED headlights, then the people detected outside urban areas will be briefly illuminated three times to draw attention to them.

Audi offers various systems for the new A7 Sportback to make parking simple. The park assist system with display of surroundings uses ultrasonic sensors to locate and measure parking spaces along the side of the road at low vehicle speeds. If a sufficiently large space is found, the system takes over parallel parking at the push of a button. The driver only has to apply the accelerator and brake.

The park assist system can maneuver the five-door coupe into a space either parallel or perpendicular to the road. The display of surroundings will alert

the driver to obstacles, even if they are off to the side. Front-mounted and reversing cameras are also standard equipment.

Safety first: Audi pre sense

The Audi pre sense safety system is available in a number of different versions for the new Audi A7 Sportback. In the standard version – Audi pre sense basic – the system intervenes upon detecting an unstable driving situation via the ESC sensors. The front seat belts are electrically tensioned; the sunroof and the side windows are closed, leaving just a small gap. The vehicle's hazard warning lights will warn the traffic behind.

The Audi pre sense front version is available in combination with ACC stop & go. This system helps the driver avoid rear-end collisions – or at least reduce the consequences of such accidents. The integrated Audi braking guard is activated in a dangerous situation to warn the driver, first with a gong and a visual signal. At the same time, the brake system is pre-filled and the dampers of the optional adaptive air suspension are set to hard.

If the driver still does not react, then the system briefly brakes the vehicle – a jolt which serves as the second warning; the belts are slightly pretensioned. If the driver depresses the pedal now, the hydraulic brake assist will increase braking power as appropriate for the situation. Should the driver ignore the warning jolt, then autonomous partial braking will be initiated – provided that the vehicle ahead is in motion. It decelerates the new A7 Sportback at a rate of 3.5 m/s^2 . The windows and sunroof will be closed, seat belts tensioned considerably, and hazard warning lights activated.

If the five-door coupe is equipped with the top version of Audi pre sense, Audi pre sense plus, then a third and a fourth stage follow in the event of an emergency. The system will increase deceleration initially to 6 m/s^2 and tighten the belts completely. The last braking phase – the autonomous full brake application – occurs roughly half a second before an inevitable collision. The consequences of such a collision can thus be greatly reduced.

At speeds below 30km/h, the five-door coupe will brake autonomously with full force in an emergency – regardless of whether the car in front is driving or standing still. Below 20km/h, this full braking in many cases prevents the accident altogether. In other cases, it greatly reduces the impact speed.

If a crash initiates the safety system, then the secondary collision brake assist system will be activated to aid the driver. It can initiate automatic braking to reduce the risks of skidding and additional collisions during the accident.

Another sub function, 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.

The new Audi S7 Sportback

The new Audi S7 Sportback is a finely toned athlete: 331kW and 550Nm of torque between 1,400 and 5,700rpm. It sprints from 0 to 100km/h in just 4.6 seconds and reaches an electronically governed top speed of 250km/h without breaking a sweat. Its combined fuel consumption is 9.3 litres per 100 kilometres – for a CO₂ equivalent of 215 grams per kilometre.

Audi continues its downsizing strategy in grand style with the 4.0 TFSI in the new S7 Sportback. This Biturbo V8 requires just 3,993cm³ of displacement (bore x stroke 84.5 x 89.0 millimetres) to generate superb power. A number of details broadcast the high-tech personality of this engine. Its aluminium/silicon crankcase is made by means of low-pressure chill casting, which ensures superior homogeneity. A frame for the lower bearing bridges of the crankshaft further boosts the crankcase's rigidity. Even with all key add-on parts, this eight-cylinder engine weighs just 219 kilograms.

The intake system is optimised for minimal flow losses. Switchable flaps in the intake ports mix the incoming air in a rolling motion to enhance charging or combustion based on the setting in question. The directly injected and intensively swirled fuel cools the combustion chambers, allowing for a high compression ratio of 10.1:1.

New approach: heat inside

The cylinder heads have the intake side on the outside and the exhaust side on the inside. This innovation enables short gas-travel paths with minimal flow losses and subsequently spontaneous response. Two large turbochargers and their air-water intercoolers are located in the 90° V of the cylinder banks.

The two turbochargers of the 4.0 TFSI generate as much as one bar of relative charging pressure. Twin-scroll technology – where exhaust gas from two cylinders is conveyed via separate ducts to the turbine wheel – eliminates unwanted interactions between the gas columns. Considerable torque is consequently generated quickly. An optional sport exhaust system is available with black tailpipe trims; an electric flap in the exhaust system controls the rich sound.

The Biturbo V8 is made especially efficient by not only the start-stop system – which deactivates the engine as soon as the vehicle comes to a stop – but also the thermal management system, which continuously regulates the flow of cooling water. The regulated oil pump varies the oil pressure as needed, and the piston oil injection nozzles are map-controlled. The piston pins bear a diamond-like-carbon (DLC) coating that reduces friction.

Four equals eight: the cylinder on demand system

One pioneering innovation from Audi is the cylinder on demand system (COD). At low to moderate load and engine speed – up to around 250Nm and 3,500rpm – this technology deactivates cylinders 2,3, 5 and 8 by closing the valves and stopping fuel injection and ignition to them. Efficiency in the active cylinders is increased because the operating points are displaced toward higher loads. This changeover takes place within a few hundredths of a seconds and so smoothly that the driver recognises four-cylinder operation practically only by the message in the driver information system display. The cylinders are reactivated as soon as the driver firmly presses the accelerator.

While the V8 is running as a V4, ignition only takes place at every 180 degrees of crankshaft angle and the engine's torsional vibrations are correspondingly higher. During these phases, Active Noise Control (ANC) largely eliminates intrusive noise by broadcasting a precise antiphase sound to the cabin through the sound system's speakers. At the same time, active engine bearings uses counterpulses to attenuate low-frequency vibrations. COD technology reduces the new S7 Sportback ADR fuel consumption by around five percent; at 100km/h the reduction is as much as around 10 percent.

The seven-speed S tronic is a perfect match for the sporty personality of this large five-door coupe. Its lower gears are closely spaced for sporty response

while the top gear is long to increase efficiency. In manual mode, the driver can use the standard shift paddles on the three-spoke steering wheel to shift gears.

Like all Audi S models, the new S7 Sportback features quattro permanent all-wheel drive. Its primary component is a centre differential with a high locking rate. The differential typically distributes 40 percent of the engine's power to the front axle and 60 percent to the rear axle. If necessary, it can redistribute power with great flexibility. Torque vectoring aids the differential for enhanced handling at the vehicle's cornering limits. The sport differential, which actively distributes power between the rear wheels, has a decidedly dynamic setup.

The chassis of the sport model also reveals its individual character. Optional dynamic steering and standard adaptive air suspension sport have S-specific characteristic lines. The wheels bear the Audi Sport 20-inch 9 J x 20 wheels five-twin-spoke design with 265/35 tyres. quattro GmbH will also supply 21-inch wheels. S7 logos adorn the black painted brake calipers up front.

Exterior design

Characteristic design details express the special status of the new Audi S7 Sportback. Its Singleframe grille is painted platinum grey and features horizontal double aluminium bars. The air inlets are kept separate in the redesigned bumper; double aluminium bars divide up the large outer inlets, which are filled with honeycomb grilles.

The new Audi S7 Sportback features exterior-mirror housings in a polished aluminium look and striking sill trims. At the tail end, the diffuser insert is platinum grey and the blade is in aluminium look. The exhaust system splits to the left in two oval twin exhaust tailpipes with chrome trims. S7 or V8 T logos can be found in the front, on the back and on the sides.

The interior likewise has many details that are typical of the S line. The instruments have grey dials and white needles. When the vehicle is started, they swing to the maximum and return to zero. A red ring surrounds the start-stop button for the engine. S7 logos adorn the three-spoke multifunction steering wheel, the backrests of the front seats and the door sill trims with carbon atlas inlays.

The standard S sport seats are covered in Valcona leather with contrasting stitching; centre sections feature a diamond pattern. There is also customised contour seats for the front. Two individual S sport seats are standard in the rear.

The pedals and the footrests in the new S7 Sportback are made of stainless steel. The standard inlays are in carbon atlas. Audi design selection Arras red with inlays in red carbon twill is available specially for the sport model. A woven-in red thread runs through the carbon-fibre fabric.

Its extensive range of standard equipment underscores the special status of the new Audi S7 Sportback in this model range. The four-zone deluxe automatic air conditioning, MMI radio plus, Bluetooth interface, driver information system with a seven-inch colour screen and a practical load-through hatch deserve a special mention.