



## Audi A5

Self-Study Programme 392



## The new Audi A5



A fascinating new model series marks Audi's entry into a highly emotional market segment. The Audi A5 unifies fascinating design with outstanding driving dynamics, driving sophistication and exceptional quality.

With its Nuvolari quattro study, Audi had previously unveiled to great acclaim its vision of a powerful and stylistically confident coupé with impressive performance and a progressive design in a high-quality package. However, the production model which has evolved from this idea surpasses the even the Nuvolari.

The new Audi A5 is the epitome of sportiness and elegance. At the same time, the Coupé offers a driving experience of outstanding dynamics. Audi has created a new concept for it: Grand Coupé - grand in appearance and driveability, generous in spaciousness and comfort. Coupé drivers make their choice of car on a very emotional level, and the main motive for buying a sporty two-door car is its design. And in that regard, the Audi A5 truly speaks for itself.

This model also represents the culmination of the equally progressive and stylistically confident Audi styling idiom. The sporty silhouette and precise lines combine with the muscular body, expressive front end and bold rear end to create a perfect and highly desirable coupé. "The Audi A5 is the most beautiful car I have ever designed", assures Walter de'Silva.

The proportions of the coupé are characterised by a very broad and flat profile, short front overhang and an elongated transition from the C-post to the small boot lid. The singleframe grille is the hallmark of the new Audi generation, while the slender, rectangular headlights and the large air scoops make the car look wider from the front. Likewise the rear end: striking horizontal lines and broad rear lights underscore the sporty appeal of the A5.

# Contents

Introduction . . . . .	4
Body . . . . .	5
Occupant protection . . . . .	10
Engine . . . . .	24
Gearbox . . . . .	30
Suspension . . . . .	46
Electrical system . . . . .	54
Infotainment . . . . .	58
Air conditioning . . . . .	74
Service . . . . .	84
Diagnostics . . . . .	90

The Self-Study Programme teaches the design and function of new vehicle models, automotive components or technologies.

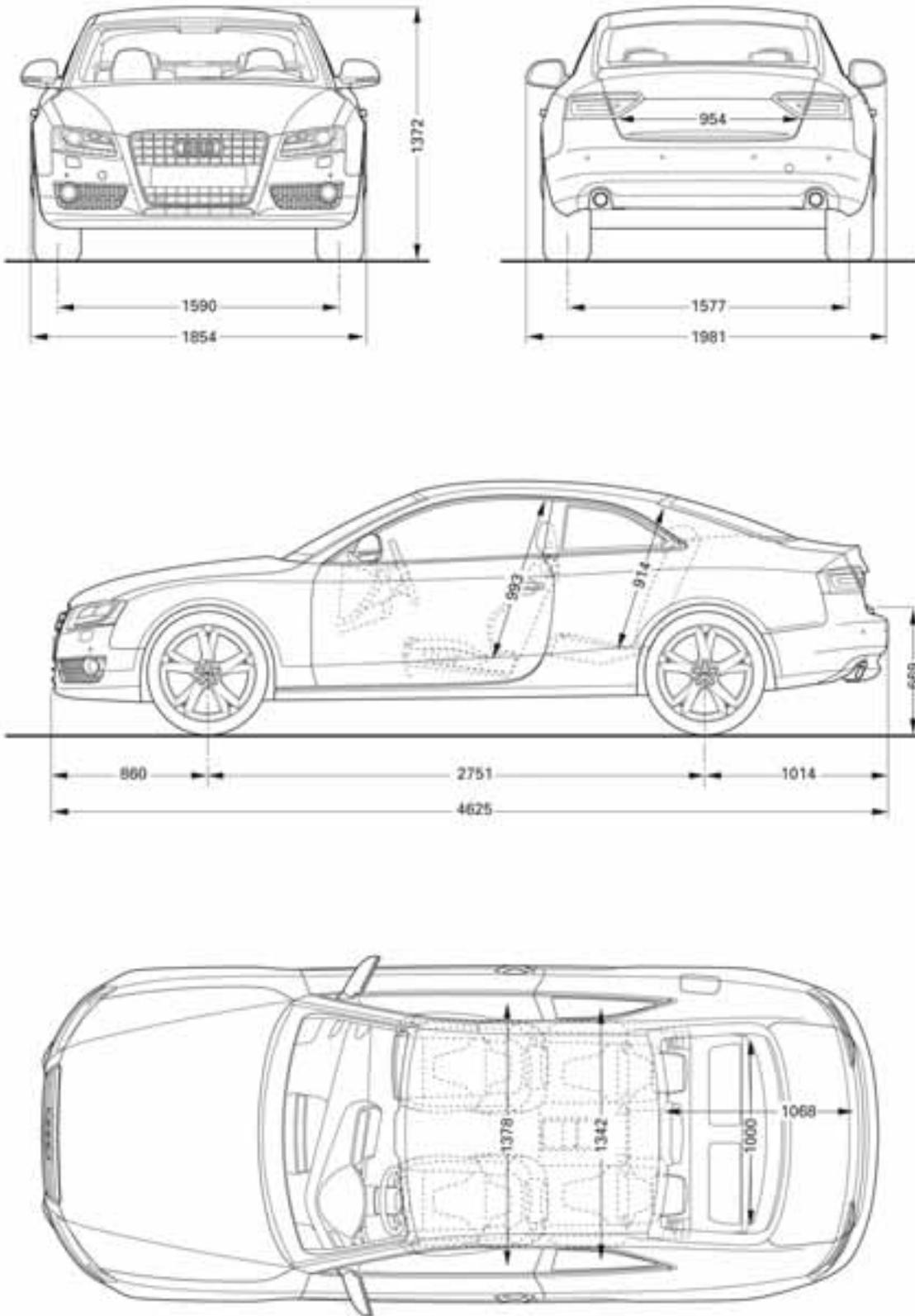
**The Self-Study Programme is not a Repair Manual!**  
The values given are intended as a guideline only and refer to the software version valid at the time of publication of the SSP.

For maintenance and repair work, always refer to the current technical literature.

<b>Reference</b>	<b>Note</b>
	

# Introduction

## Overview



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## Bodyshell

The extremely high rigidity of the bodyshell typical provides precise handling and a pleasant feeling of solidity and comfort. In the case of the Audi A5, the engineers have succeeded in achieving a high degree of sportiness and agility combined with exceptional vibration comfort.

Cutting-edge technology, such as tailored blanks of various wall thickness and weldbond joining, have made possible a lightweight body construction. Likewise the aluminium front wings. The largely smooth underbody cladding enhances the aerodynamics of the Audi A5. All these efforts have resulted in a very high degree of rigidity in addition to a low body weight and well-balanced axle load distribution.



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# Body

## Materials

In future body construction, lightweight build and rigidity of the overall structure will be key factors. The most recent innovation in this area is what is known as ultra high strength hot-formed steel, which is used for the first time in multiple applications on the Audi A5/S5. The existing joining techniques were modified accordingly.

- |   |                               |   |                                      |
|---|-------------------------------|---|--------------------------------------|
|  | Conventional deep-drawn steel |  | Ultra high strength steel            |
|  | Higher-strength steel         |  | Ultra high strength hot-formed steel |
|  | High-strength steel           |  | Aluminium                            |



The body construction is a testimony to Audi's experience in lightweight design and its knowledge of innovative welding and joining techniques. Here are examples:

- body weight was reduced by 17.6 kilogrammes through the use of hot formed steel
- joining techniques were employed in a property-oriented manner, i.e. according to component-specific load
- tailored blanks of various wall thickness were used to increase overall body rigidity
- aluminium wings



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The result of these efforts is a very high rigidity in addition to low body weight and a well-balanced axle load distribution.

For the occupants of the Audi A5/S5 this means a marked improvement in safety, agility and driving dynamics. Body vibration has also been reduced, bringing a further noticeable improvement in driving comfort.

## Repair concept of hot formed steel

Hot formed steel is used in the following areas:

- B-post
- Sill inner side
- Rear longitudinal beam
- Tunnel reinforcement
- Tunnel bridge
- Longitudinal beam reinforcement



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New repair methods are required for the repair of hot formed steel. Straightening and reshaping even of minor deformations are not possible due to the high tensile yield strength and the rebound effect of hot formed steel.

A damaged component must be completely cut out and partially replaced in accordance with the manufacturer's specifications.

The use of butt welding for the repair of hot formed, ultra high strength steel causes weakening in this region because of microstructural changes in the material arising from the heat input into the material during the welding process.

For this reason, suitable service solutions were incorporated into the development of the body structure. This means that affected components can be replaced wholly or partially in special parting sections (depending on energy flow).

**Upper area of the B-post:**

The parting cut must be made as described in the Workshop Manual on General Body Repairs.

**Lower section of B-post:**

possible using a service part. The parting cut must be made as described in the Workshop Manual on General Body Repairs.

**Rear longitudinal beam:**

As a tailored blank component, the rear longitudinal beam was designed in such a way that the ultra-high-strength section will only deform if major damage occurs to the surrounding body structure and straightening and reshaping are no longer possible.

Partial replacement of the rear longitudinal beam is possible. The parting cut must be made as described in the Workshop Manual on General Body Repairs.



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**Tailored blank components:**

Hot formed steel - high-strength steel

# Occupant Protection

## Occupant protection system on the new Audi A5

The Technical Development Team of Audi AG was tasked with developing a high-quality occupant protection system. Compliance with current legislation and consumer protection tests is only one of the many safety requirements. In addition analyses of actual accidents in road traffic were included into the development process. Audi's in-house requirements presented additional challenges to the development team.

The occupant protection system on the Audi A5 comprises the following components and systems:

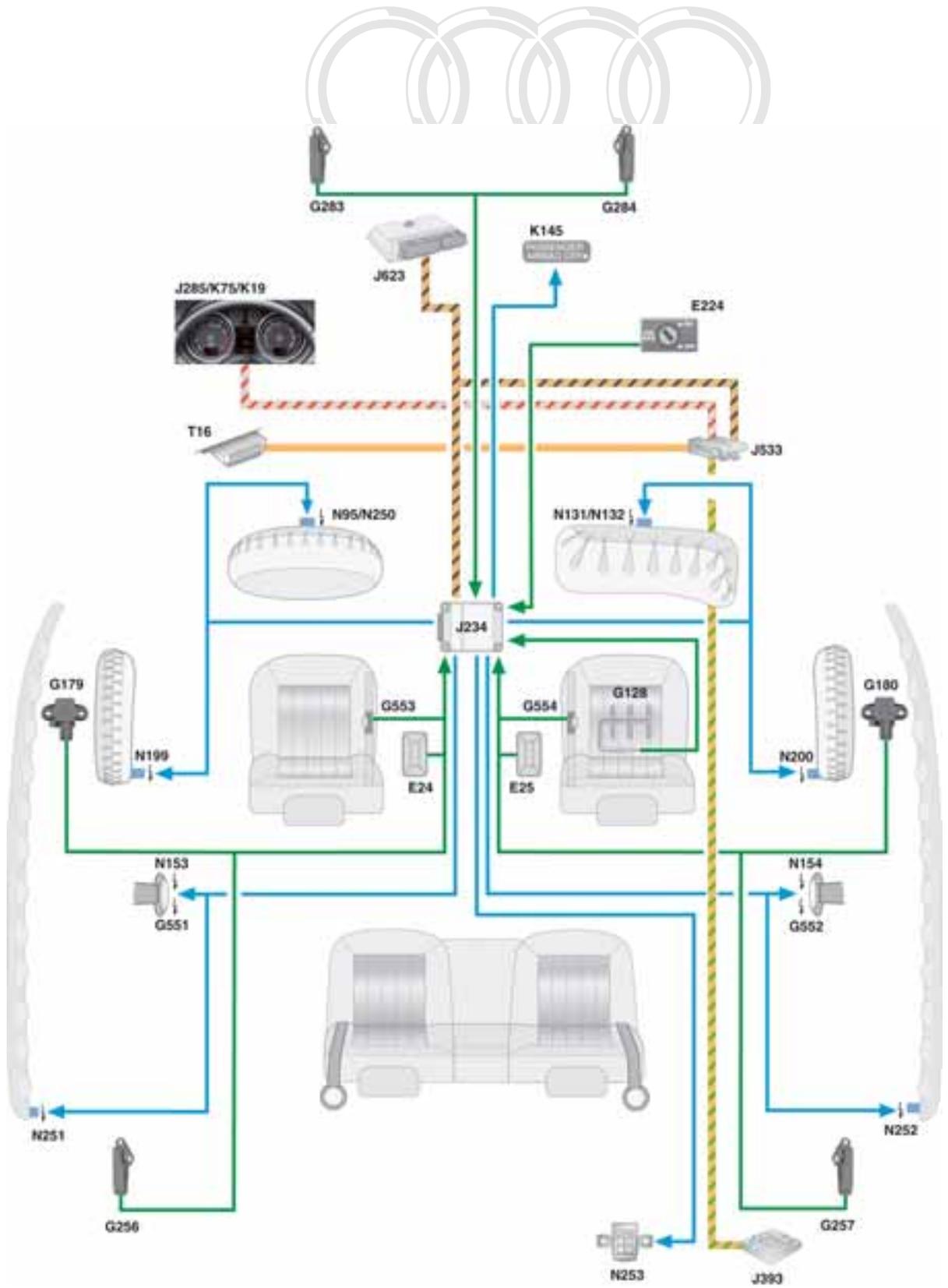
- Airbag control unit
- Driver airbag, two stage
- Front passenger airbag, adaptive
- Front side airbags
- Head airbags (sideguard)
- Crash sensors for front airbag (upfront sensors)
- Crash sensors for side impact detection in the doors
- Crash sensors for side impact detection in the C-posts
- Front belt tensioner with switchable belt force limiter
- Battery disconnect
- Seat belt reminder for driver and front passenger
- Seat belt switch, driver and front passenger side
- Seat occupied recognition feature in the front passenger seat
- Driver and front passenger seat position detection
- Backguard

The vehicle is optionally available with a key switch for deactivating the front passenger front airbag with associated warning lamp.

Due to the various requirements and statutory market regulations incumbent upon vehicle manufacturers, equipment can vary, particularly for the US market.

### Legend:

E24	Driver side belt switch	J393	Convenience system central control unit
E25	Front passenger side belt switch	J533	Data bus diagnostic interface (Gateway)
E224	Airbag disabling key switch, front passenger side (optional)	J623	Engine control unit
G128	Seat occupied sensor, front passenger side	K19	Seat belt warning system warning lamp
G179	Side airbag crash sensor, driver side (driver door)	K75	Airbag warning lamp
G180	Side airbag crash sensor, front passenger side (front passenger door)	K145	Passenger airbag off warning lamp (optional)
G256	Rear side airbag crash sensor, driver side (C-post)	N95	Airbag igniter, driver side
G257	Rear side airbag crash sensor, front passenger driver side (C-post)	N131	Front passenger side airbag igniter 1
G283	Driver side front airbag crash sensor (left front end)	N132	Front passenger side airbag igniter 2
G284	Front passenger side front airbag crash sensor (right front end)	N153	Driver seat belt tensioner igniter -1-
G551	Belt force limiter, driver side	N154	Front passenger seat belt tensioner igniter -1-
G552	Belt force limiter, front passenger side	N199	Side airbag igniter, driver side
G553	Seat position sensor, driver side	N200	Side airbag igniter, front passenger side
G554	Seat position sensor, front passenger side	N250	Driver side airbag igniter -2-
J234	Airbag control unit	N251	Driver side curtain airbag igniter
J285	Control unit with display in dash panel insert	N252	Front passenger side curtain airbag igniter
		N253	Battery isolation igniter
		T16	Connector, 16-pin, diagnostic port



# Occupant Protection

## Airbag control unit J234

The airbag control unit J234 and the electronics integrated therein basically have the following main tasks:

- Collision detection (front, side, rear)
- Evaluation of all input information
- Defined deployment of the belt tensioners, airbags and battery disconnect
- Defined deployment of the second airbag stage (driver side)
- Control of the adaptive front passenger front airbag
- Belt force limiter control
- Seat belt reminder control
- Continuous monitoring of the complete airbag system
- Independent energy supply via capacitor for a defined period of time (up to 200 ms)
- Fault indication via failure warning lamp
- Storage of fault and crash information
- Indication of a collision event to other system components via powertrain CAN bus

The airbag control unit is integrated within the powertrain CAN data bus so it can exchange information with other control units.

An airbag control unit can only be replaced using a VAS tester and the "Guided Fault Finding" or "Guided Functions" application.



Audi  
Airbag control unit J234

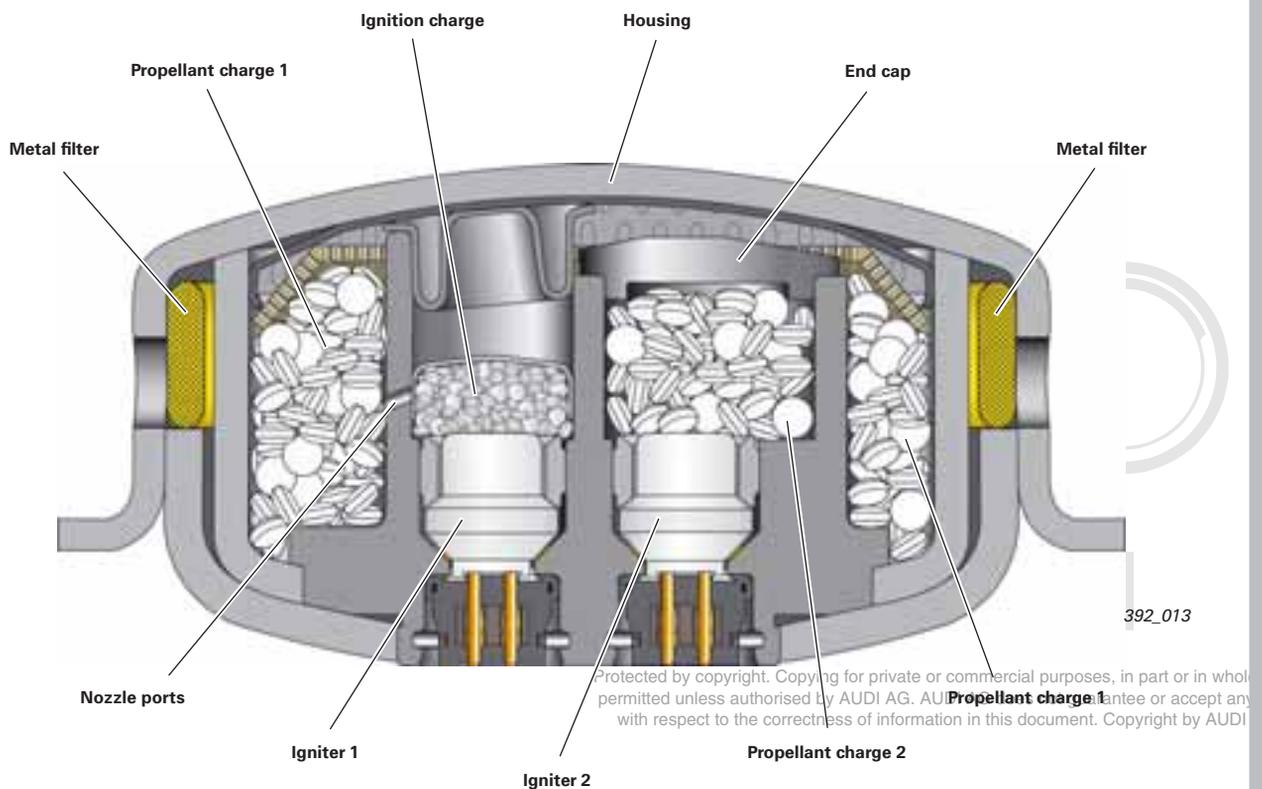


## Airbag igniter, driver side N95 Driver side airbag igniter -2- N250

As with other Audi models, the Audi A5 is equipped with a two-stage driver front airbag. The airbag control unit J234 is capable of adapting the interval between the two ignition stages depending on the accident severity and type.

In any event, both propellant charges are ignited. This prevents the propellant charge from remaining active after the airbag has deployed.

Schematic diagram of the gas generator



Igniter 1 activated by the airbag control unit J234 fires ignition charge. The actual propellant charge 1 is ignited via nozzle bores. If the gas pressure produced by the burn-off of propellant charge 1 exceeds a predefined value, the gas generator housing deforms thereby opening the path via the metal filter to the airbag. The airbag unfolds and is inflated.

On expiration of a predefined interval, the airbag control unit J234 energises the igniter 2, which directly ignites the secondary propellant charge. When a set pressure is exceeded, the developing gas lifts the cap off the second-stage chamber and flows through the stage 1 combustion chamber and into the airbag.

# Occupant Protection

## Front passenger side airbag igniter 1 N131 Front passenger side airbag igniter 2 N132

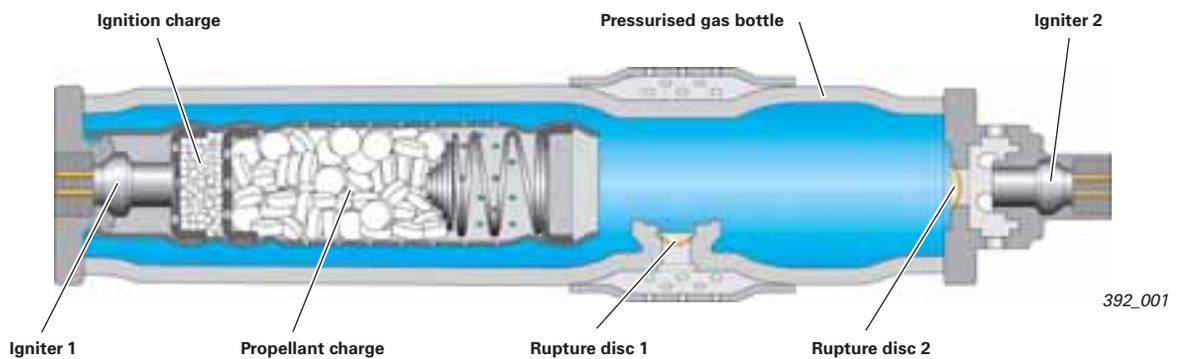
The Audi A5 is the first vehicle in the Audi model range to be equipped with an adaptive front passenger airbag. It takes the form of a single-stage hybrid gas generator with a second discharge port.

This type of gas generator allows variable degrees of inflation of the front passenger airbag. The airbag control unit J234 determines the interval between activation of the two igniters based on accident severity and front passenger seating position.

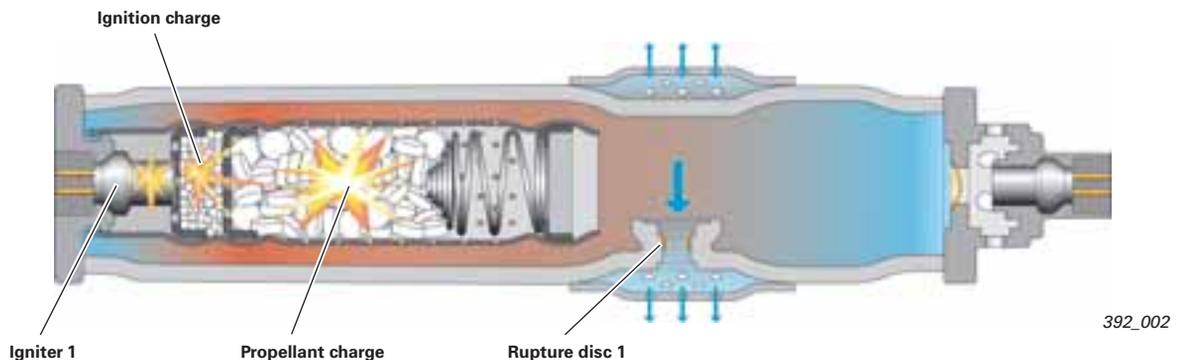
The pyrotechnic propellant charge which is activated by airbag control unit J234 is integrated in the pressurised gas bottle. The so-called cold gas in the pressurised gas bottle is pressurised to approx. 400 bar and is a mixture of approx. 95 % argon and approx. 5 % helium.

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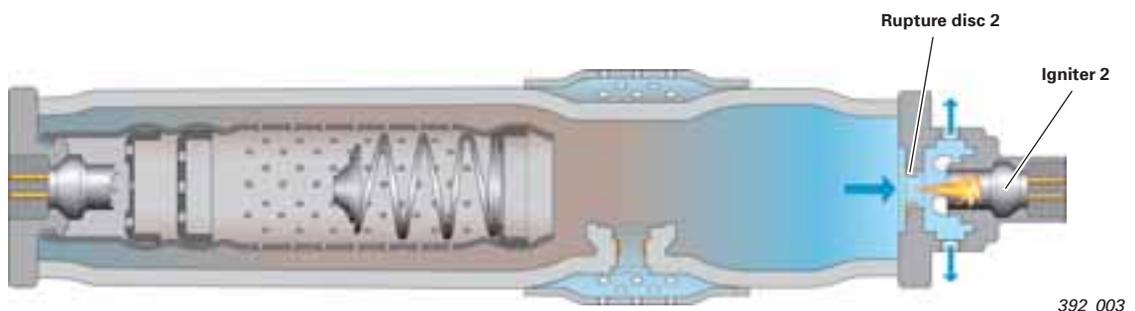
The schematic diagrams below show the gas generator.



The ignition charge fired by igniter 1 ignites the actual propellant charge. The pressure inside the pressurised gas bottle increases, bursting rupture disc 1 at a certain pressure. The gas mixture inflates and unfolds the airbag.



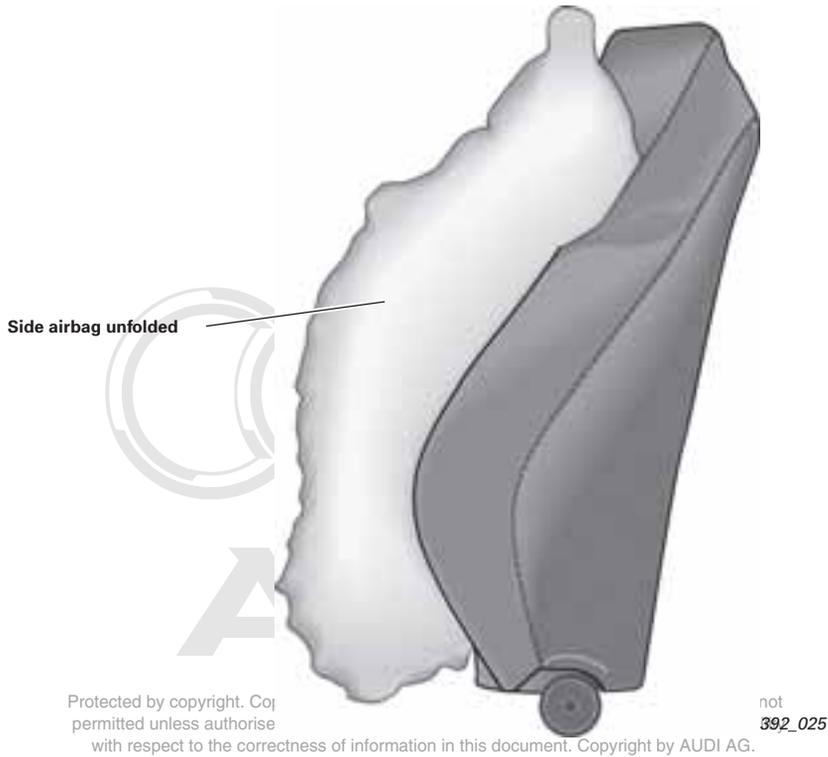
After a defined interval, the airbag control unit J234 activates igniter 2. A targeted pressure pulse from igniter 2 causes rupture disc 2 to burst. A portion of the remaining gas from the pressurised gas bottle now flows into the atmosphere, and no longer into the airbag.



**Side airbag igniter, driver side N199**  
**Side airbag igniter, front passenger side N200**

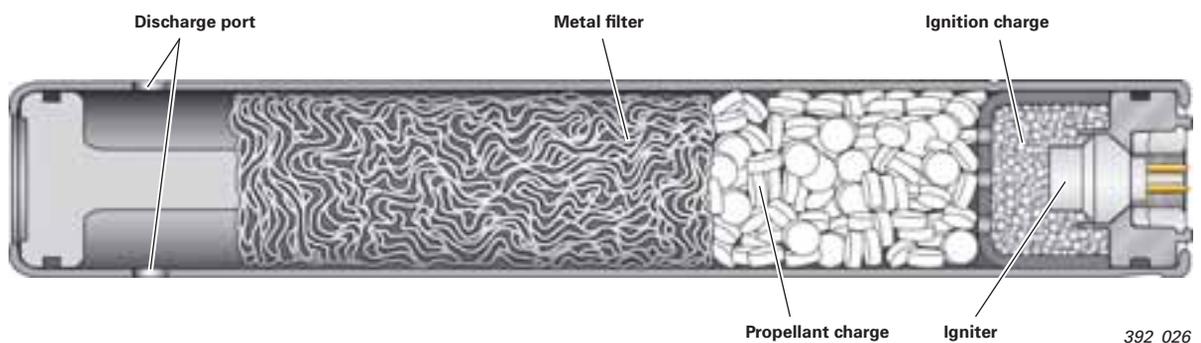
The side airbags are so-called "Soft Cover Modules". In these modules, the plastic case which encloses the entire airbag module has been replaced by a textile sleeve.

The soft surface of the textile sleeve allows better integration of the airbag module in the seat back. The lower weight of the sheath is a further advantage.



The airbag control unit J234 energises the corresponding side airbag igniter. The ignition charge fired by the igniter in turn ignites the actual propellant charge. The developing gas is cleaned by the metal filter and cooled down, unfolding and inflating the airbag.

**Schematic diagram of the gas generator**

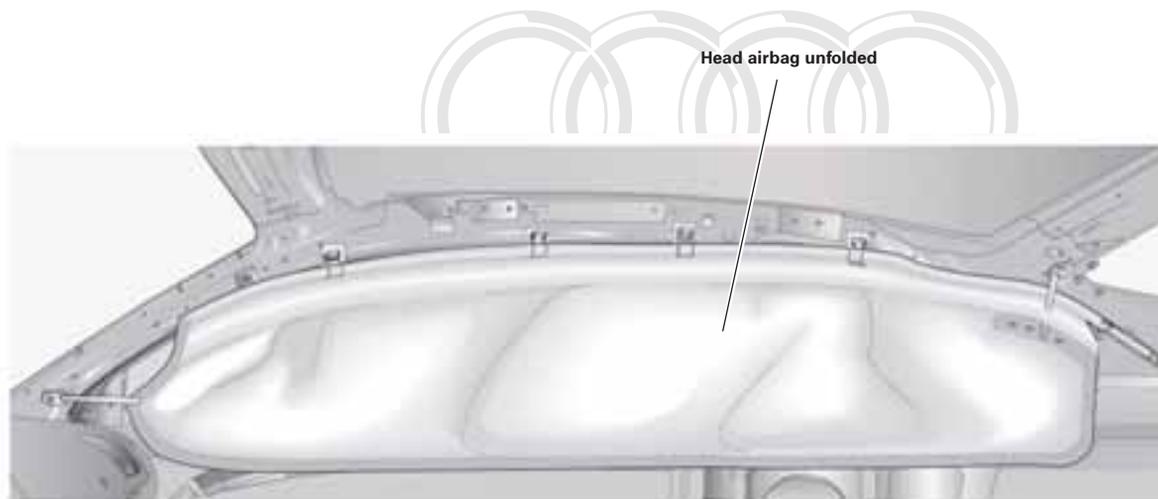


# Occupant protection

## Driver side curtain airbag igniter N251 Front passenger side curtain airbag igniter N252

The head airbags on the Audi A5 extend from the A post to the C post and therefore cover almost the entire side window area.

This method of installing the airbags ensures that the occupants are well protected in the event of a side impact.

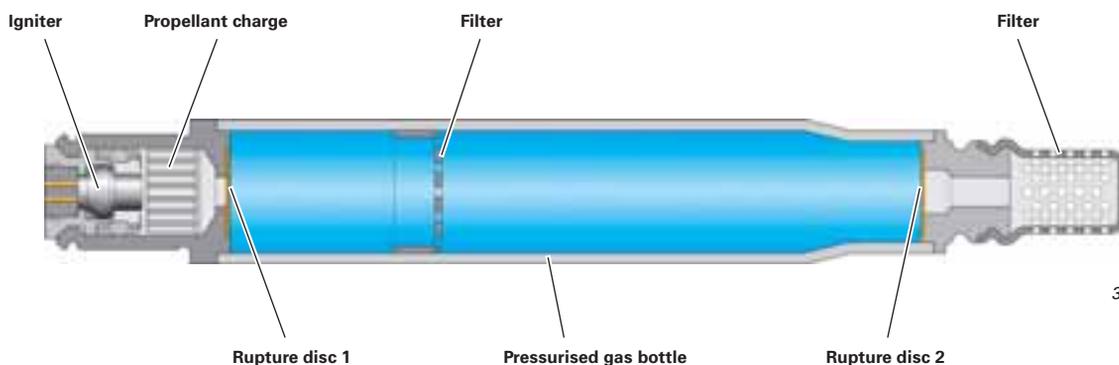


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A hybrid gas generator performs the task of inflating the head airbag. A pressurised gas bottle is filled with compressed gas. The gas is pressurised to approx. 450 bar and is approx. 95 % argon and 5 % helium.

The igniter is activated by the airbag control unit J234. The propellant charge is ignited as a result. The combustion of the propellant charge produces a gas pressure which causes the rupture disc 1 to burst. The gas pressure expands inside the pressurised gas bottle and causes rupture disc to break at a defined pressure. The gas mixture flows through the filter into the airbag.

Schematic diagram of the gas generator



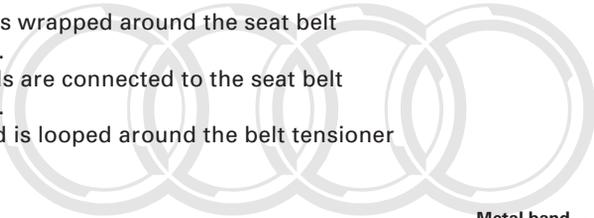
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**Driver seat belt tensioner igniter -1- N153**  
**Front passenger seat belt tensioner igniter -1- N154**

The Audi A5 is equipped with driver and front passenger belt tensioners. So-called band tensioners are used on all models world-wide.

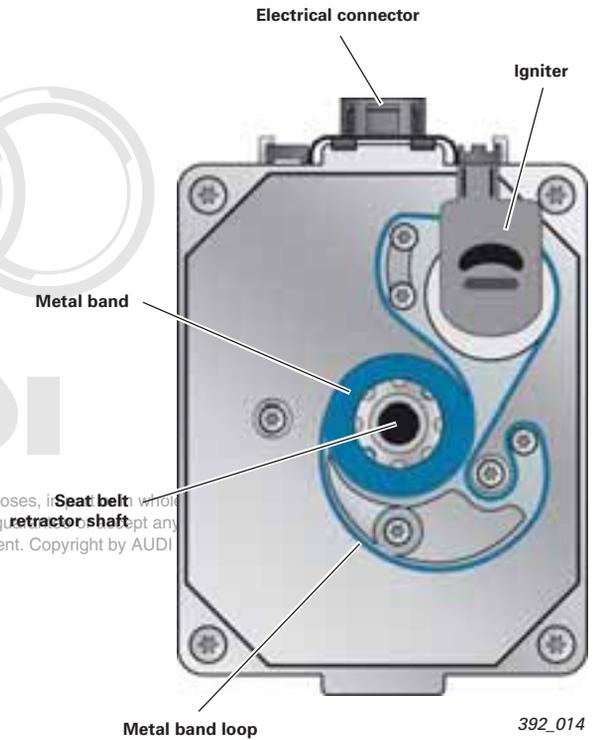
The schematic diagrams below show the principle of the belt tensioner.

A metal band is wrapped around the seat belt retractor shaft. Both open ends are connected to the seat belt retractor shaft. The closed end is looped around the belt tensioner igniter.

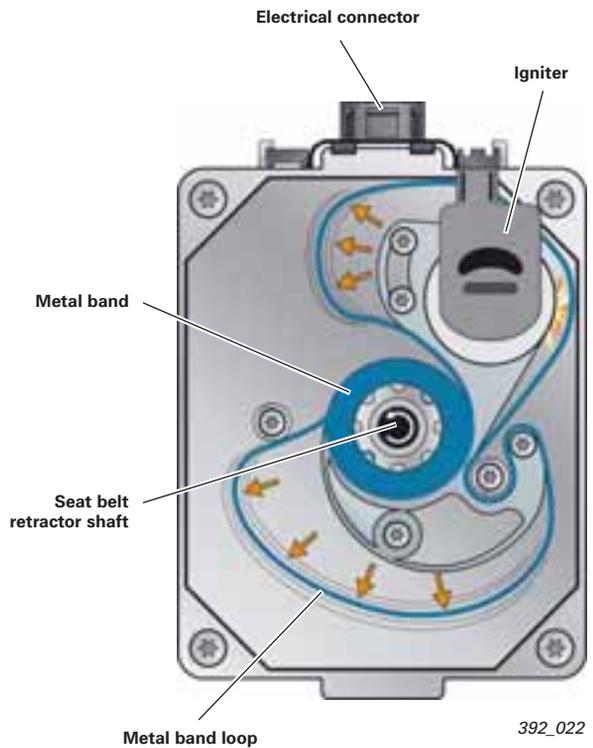


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If the igniter is ignited by the airbag control unit J234. The loop of the metal band enlarges due to the evolving pressure. The movement of the metal band exerts a pull on the seat belt retractor shaft, which thereupon begins to rotate tensioning the seat belt.



To reduce the pressure losses, the housing cover surface between which the metal band moves is coated with a film of silicone.

# Occupant Protection

## Belt force limiter, driver side G551 Belt force limiter, front passenger side G552

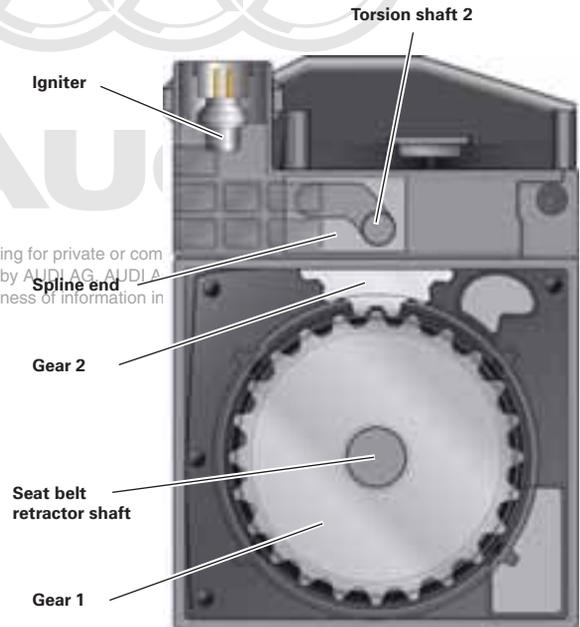
The front inertia-reel seat belts have a two-stage belt force limiter.

In the event of a collision, the belt tensioners (band tensioners) are ignited first.

The belt tensioner retracts the seat belt as far as possible. The inertia-reel seatbelt subsequently blocks the seat belt retractor shaft and prevents the seat belt from unwinding, which would otherwise occur due to the forward motion of the vehicle occupants.

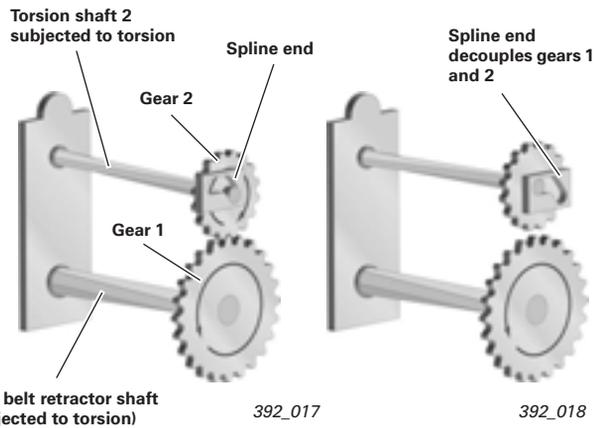
If the occupant's body now moves further forwards due to deceleration, the belt force limiter will allow limited unwinding of the seat belt upwards of a defined force.

The schematic diagrams on the right show the principle of the belt force limiter.



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The seat belt retractor shaft is designed as a torsion shaft and is connected to torsion shaft 2 via gears 1 and 2. Both torsion shafts are subjected to torsion (high belt force).



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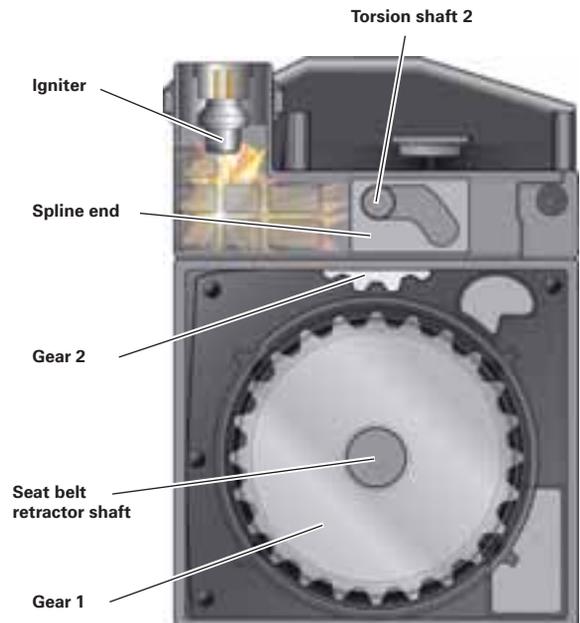
Depending on accident severity and seating position, the airbag control unit J234 decides when the belt force limiter igniter is activated.

The second torsion shaft is decoupled.

The seat belt retractor shaft now counteracts by itself the seat belt unwinding force (low belt force level).

To ensure a good level of occupant protection, the belt tensioner, belt force limiter and front airbags work in concert with one another.

In a side or rear collision, the belt force limiter igniters are not activated.



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## Seat position sensor, driver side G553 Seat position sensor, front passenger side G554

The driver and front passenger seats on the Audi A5 are equipped with seat position sensors G553 and G554. They are of the type Hall sensor. Based on the power consumption of the seat position sensors, the airbag control unit J234 is able to determine whether the seats are located in the front third or in the rear two thirds of the seat adjustment range. The airbag control unit J234 uses this information to activate adaptivity of the belt force limiter and the front passenger airbag to the correct timing.

If the seat is in the front third of the adjustment range, the airbag control unit J234 can activate igniter 2 of the adaptive airbag earlier than if the seat was in the rear two thirds of the adjustment range.

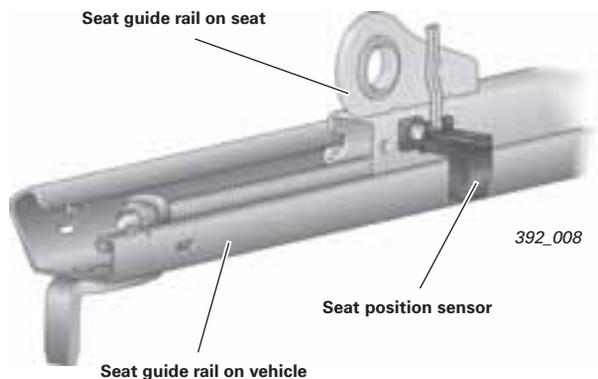
The earlier ignition of the second igniter makes the airbag softer and allows smaller individuals to sink into the airbag in a controlled fashion. The belt force limiter igniters G551 and G552 are also activated earlier. Thus, the restraint systems are adapted to the accident situation and seat position.

Again, the following rule of thumb applies:  
A correctly adjusted seat, correct seating position and a correctly fastened seat belt are the basic requirements for effective occupant protection.

The seat position recognition sensors work in conjunction with the seat rails mounted on the tunnel side.

If the seat occupied recognition sensor is located above the seat guide rail attached to the vehicle, its power consumption is approx. 5 - 7 mA.

The airbag control unit J234 determines that the seat is in the back position.

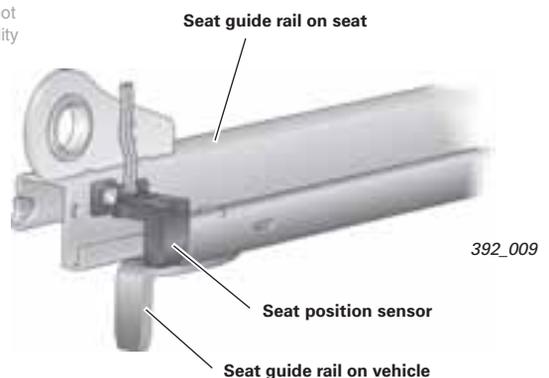


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If the seat is pushed forward and the seat position sensor moves beyond the seat guide rail attached to the vehicle, the power consumption of the sensor increases to approx. 12 - 17 mA.

The airbag control unit J234 determines that the seat is in the front position.



# Occupant Protection

## Battery isolation igniter N253

The battery isolation igniter N253 disconnects the vehicle battery from the starter and alternator in the event of a collision.

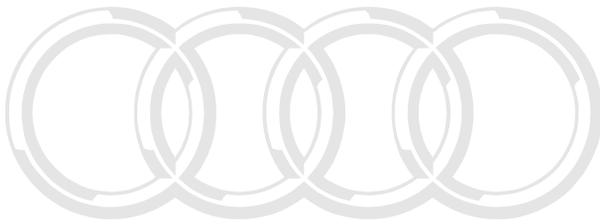
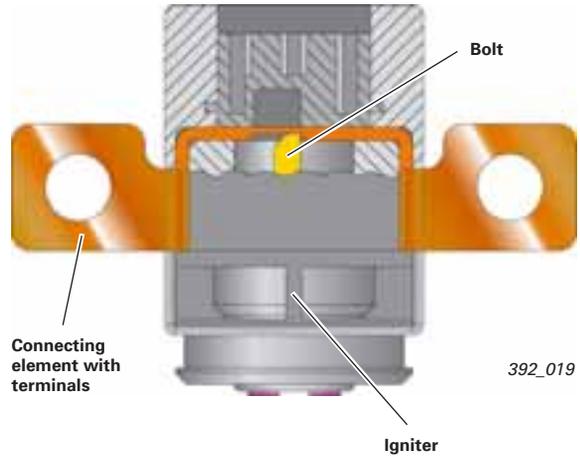
Use is made of a pyrotechnic component, which is activated by the airbag control unit J234 upon deployment of the airbag in an accident of high severity.

In the event of a rear collision, only the belt tensioners and the battery isolation igniter are activated.

If the pyrotechnic propellant charge is ignited, the resultant gas pressure displaces the bolt of a piston and disconnects the two terminals.

After activation, the battery isolation igniter must be replaced.

Battery isolation igniter



The battery isolation igniter N253 is located in the main fuse box directly on the battery in the boot of the Audi A5.



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Battery isolation igniter

Battery isolation igniter



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## Supplements to the occupant protection system for specific markets

To bring the Audi A5 into compliance with the statutory and market-specific requirements of several countries, the occupant protection system can be equipped with additional functions and components.

Possible additional systems are:

- seat occupied recognition sensor, front passenger side
- knee airbags
- adaptive driver airbag
- rear belt tensioner (ball-gear)
- seat belts with "child seat restraint" function (front passenger seat and rear seats)

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### Seat occupied recognition, front passenger side

The front passenger seat occupied recognition system is also used in other Audi models, e.g. Audi Q7. However, the component parts of the system have been adapted to suit the Audi A5.

The system basically comprises the following components:

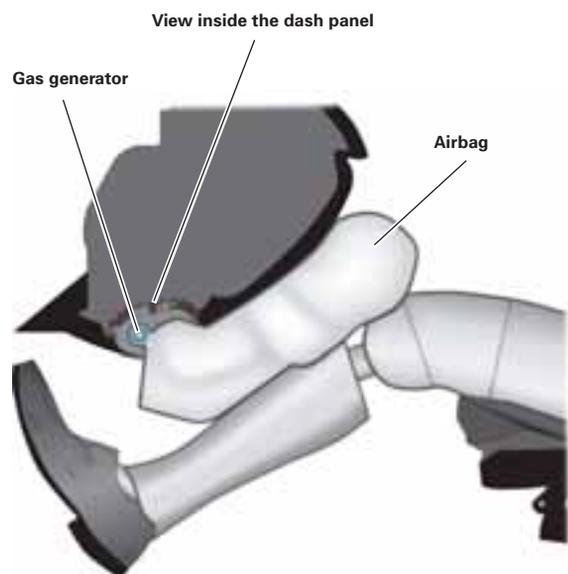
- Seat squab
- Sensor mat for seat occupied recognition
- Pressure sensor for seat occupied recognition G452
- Seat occupied recognition control unit J706
- Front passenger side belt switch E25
- Seat belt force sensor for seat occupied recognition G453
- Front passenger side airbag deactivated warning lamp K145 (PASSENGER AIRBAG OFF)
- Airbag control unit J234

} These components form a single unit and must not be separated from each other.

### Knee airbag igniter, driver side N295 Knee airbag igniter, front passenger side N296

Ignited knee airbags allow the occupants to participate earlier in vehicle deceleration. On the driver side, the knee airbag can be found in the footwell trim panel below the dash panel. On the front passenger side, the knee airbag can be found behind the glove box lid.

Hybrid gas generators are used as gas generators.



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# Occupant protection

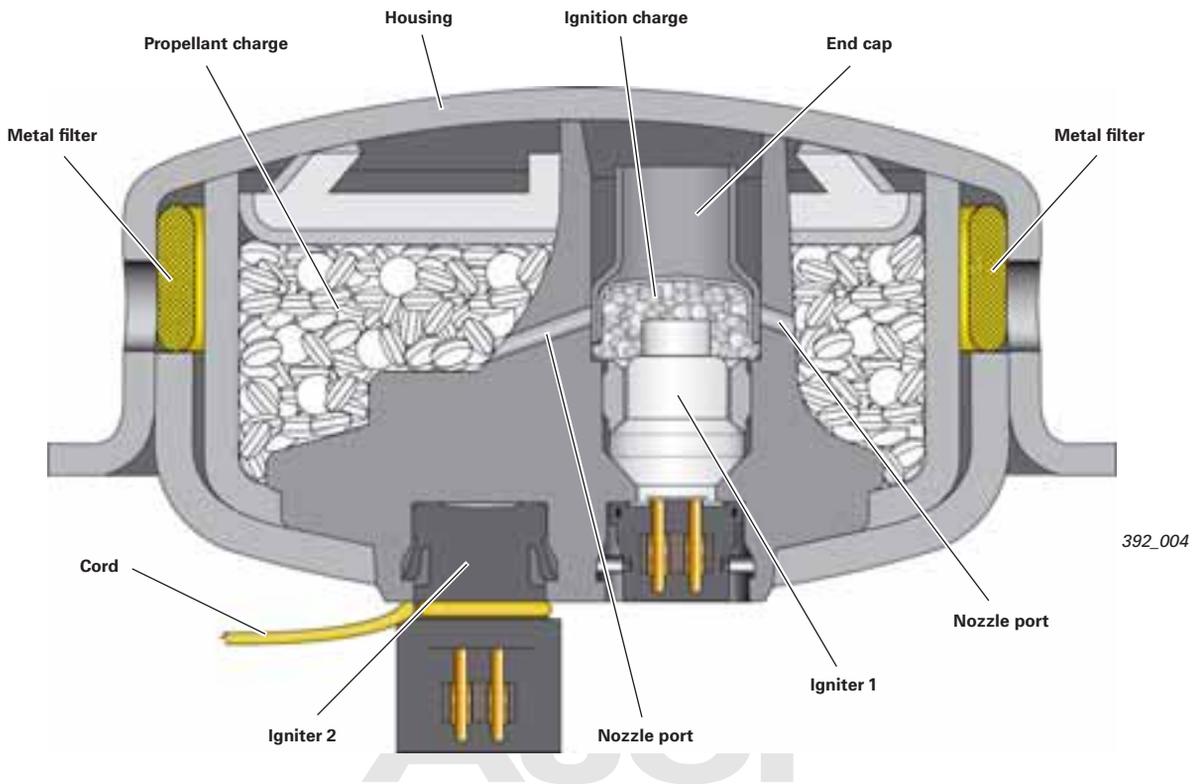
## Airbag igniter, driver side N95 Driver side airbag igniter -2- N250

In several markets the Audi A5 is equipped with an adaptive driver airbag. It is a single-stage solid fuel generator with an additional igniter.

The airbag control unit J234 activates igniter 1. The ignition charge is thus ignited.

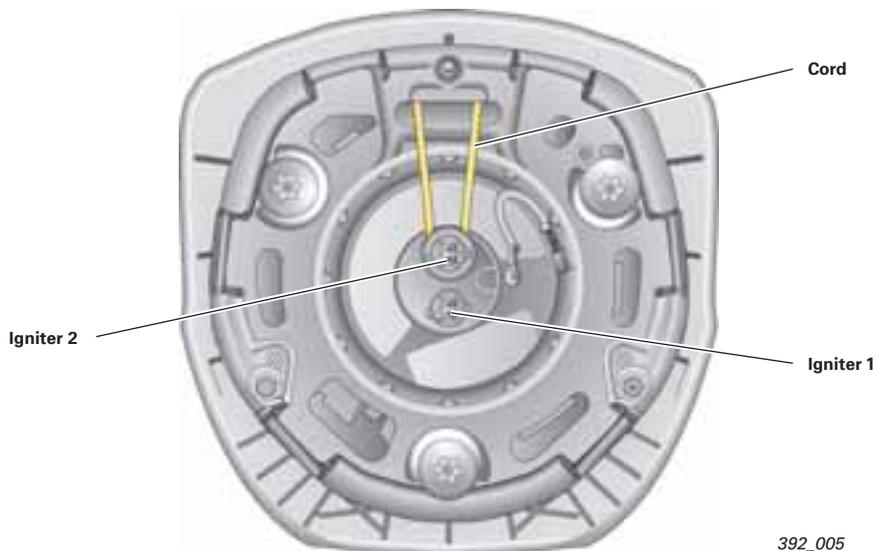
The actual propellant charge is then ignited via nozzle ports. If the gas pressure produced by the combustion of the propellant charge exceeds a defined value, the gas generator housing deforms thereby opening the path via the metal filter to the airbag. The airbag unfolds and is inflated.

Schematic diagram of the gas generator

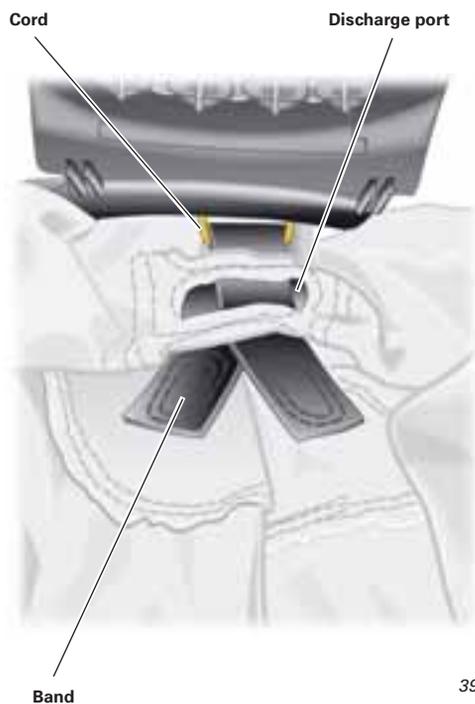


An additional igniter, driver side airbag igniter -2- N250, is attached to the back of the airbag. A cord which seals an additional discharge port is wrapped around this igniter.

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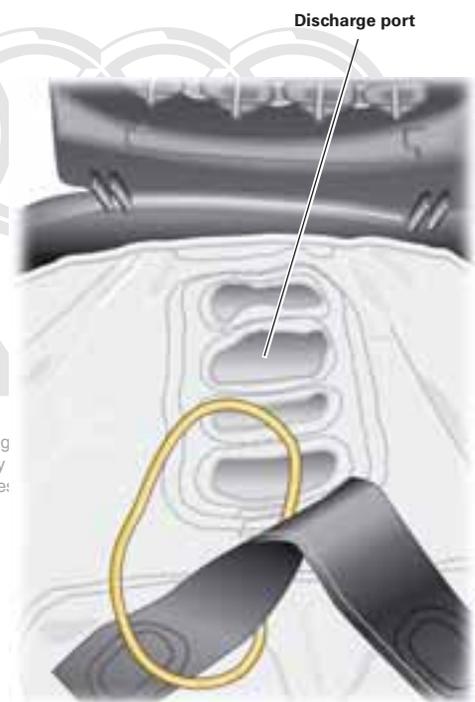


As long as the cord is held in place by the igniter, this discharge port is sealed.



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The airbag control unit J234 activates igniter 2. The igniter housing ruptures and the cord is released. The volume of the airbag increases by approx. 4 litres and the additional discharge port is opened. Now more gas can escape through this discharge port when the occupant sinks into the airbag. The airbag is "softer" for the occupants.



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The vehicle airbag's gas generator is floating-mounted in a rubber ring, depending on model. This allows vibrations to be minimised at the steering wheel.

# Engine

## 3.0l V6 TDI Common Rail

### Technical features

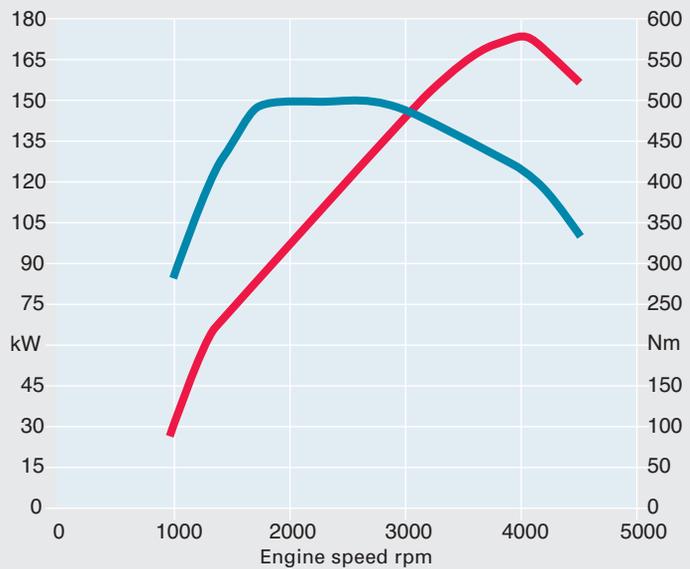
- Chain drive on the transmission side
- Common rail injection system with 1600 bar injection pressure
- 8-port piezoelectric injectors
- Turbocharger with variable turbine geometry
- Steel glow elements
- Diesel particulate filter



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### Torque/power curve

- Max. torque in Nm
- Max. power output in kW



### Specifications

<b>Engine code</b>	CAPA
<b>Type of engine</b>	V6 diesel engine with 90° included angle
<b>Displacement in cm<sup>3</sup></b>	2967
<b>Max. power output in kW (bhp)</b>	176 (238 bhp) at 4000 rpm
<b>Max. torque in Nm</b>	500 from 1750 to 2750 rpm
<b>Number of valves per cylinder</b>	4
<b>Bore in mm</b>	83
<b>Stroke in mm</b>	91.4
<b>Compression ratio</b>	17.0 : 1
<b>Firing order</b>	1-4-3-6-2-5
<b>Engine weight in kg</b>	approx. 221
<b>Engine management</b>	Bosch EDC 16 CP
<b>Fuel grade</b>	Diesel
<b>Exhaust emission standard</b>	EU 5

## 4.2I V8 FSI engine

### Technical features

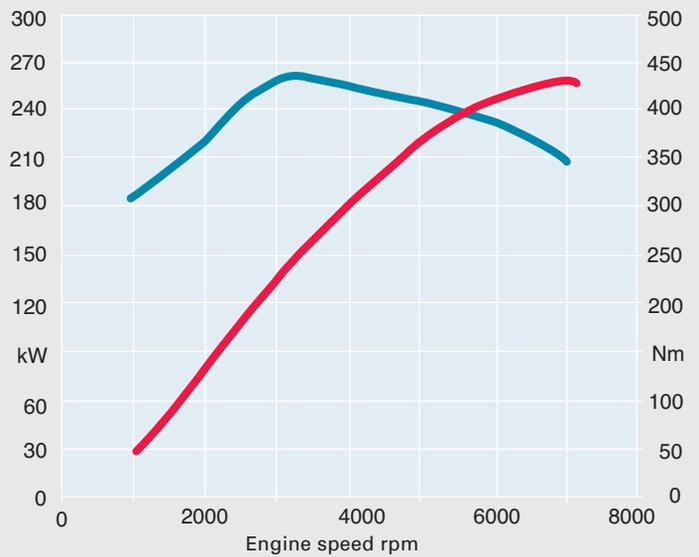
- Chain drive on the transmission side
- Selective petrol direct injection system (FSI)
- Pencil ignition coils
- 2 primary catalytic converters and 2 main catalytic converters
- 4 oxygen sensors



392\_033

### Torque/power curve

- Max. torque in Nm
- Max. power output in kW



### Specifications

<b>Engine code</b>	CAUA
<b>Type of engine</b>	V8 90° included angle 4V FSI
<b>Displacement in cm<sup>3</sup></b>	4163
<b>Max. power output in kW (bhp)</b>	260 (354) at 7000 rpm
<b>Max. torque in Nm</b>	440 at ~3500 rpm
<b>Number of valves per cylinder</b>	4
<b>Bore in mm</b>	84.5
<b>Stroke in mm</b>	92.8
<b>Compression ratio</b>	12.5 : 1
<b>Firing order</b>	1-5-4-8-6-3-7-2
<b>Engine weight in kg</b>	approx. 198
<b>Engine management</b>	Bosch MED 9.1.1
<b>Fuel grade</b>	RON 98. 95
<b>Exhaust emission standard</b>	EU 4/LEV II

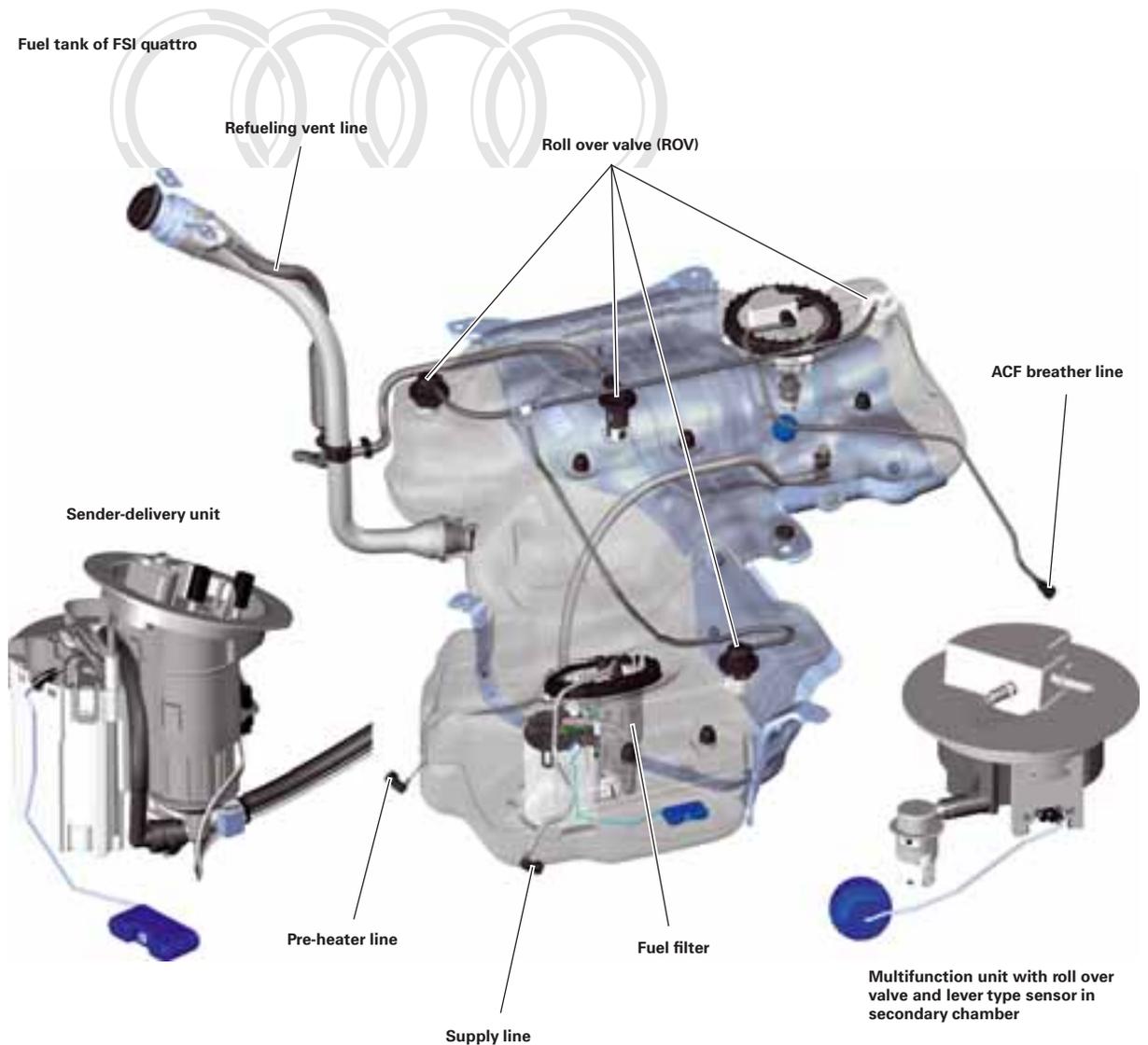
## Fuel system

The following applies to all variants:

The fuel tanks are of unitary construction and are made of plastic. To stabilise the sender-delivery unit supported by the base of the fuel tank, U-shaped channels have been incorporated into the bottom of the tank. Three-conductor sliding contact potentiometers are used as fuel gauge senders.

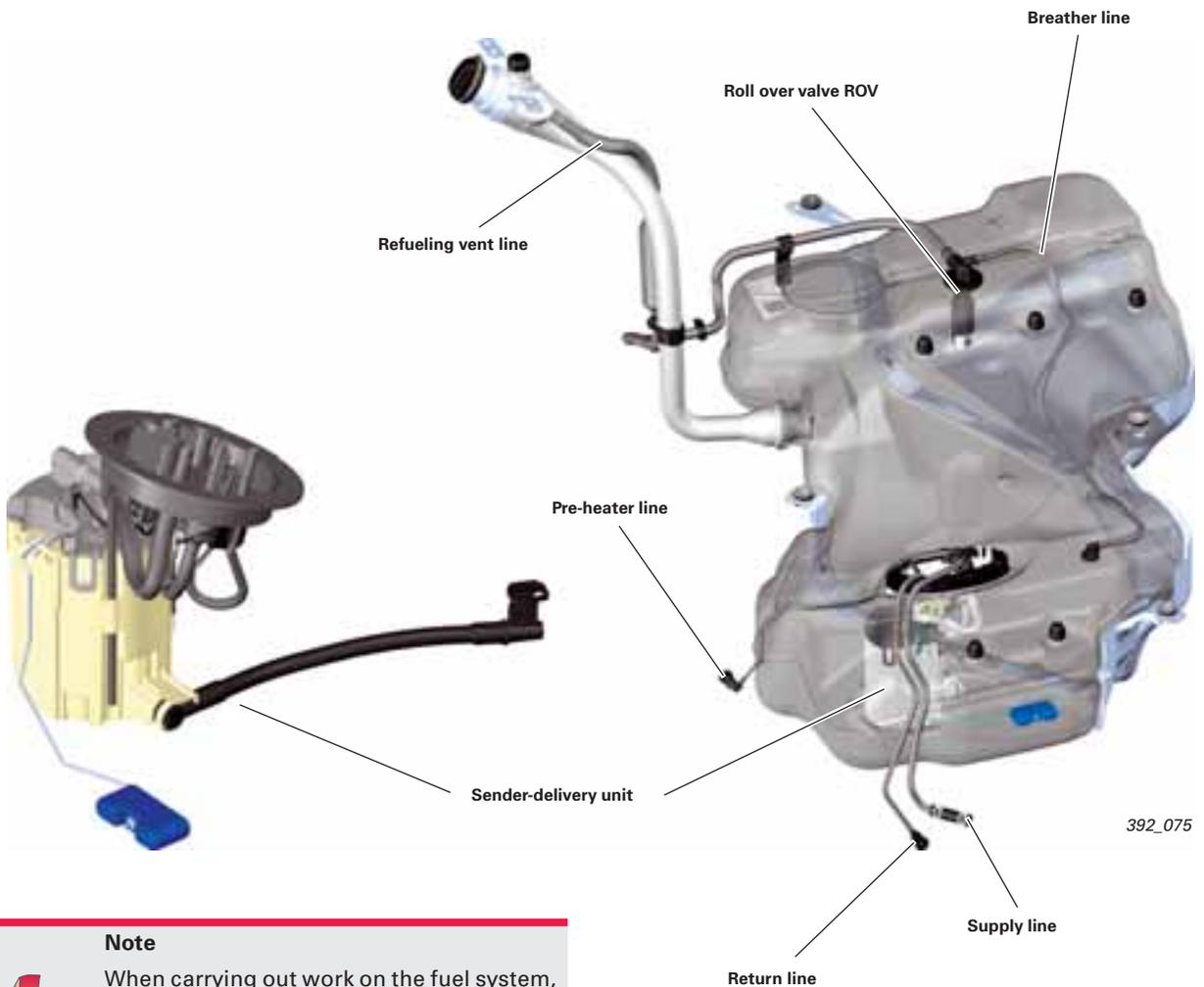
Front-wheel drive models have a tank capacity of 65 litres, while the tank capacity on quattro models is only 64 litres to allow for the additional rear axle drive.

In petrol engines, the fuel filter and pressure limiting valve are integrated in the fuel tank. They are designed for lifetime use.



If servicing is required, two fuel delivery units are available as spare parts. A distinction is made here between petrol and diesel engines. The quattro variant is always supplied in combination with a pre-heater. In this case, the unused terminals are sealed using cell plugs and dummy plugs. These plugs can be ordered from the electronic parts catalogue (ETKA). The fluid level sensors, the suction jet pumps and the fuel filter are also available as replacement parts.

#### Fuel tank of TDI Front



#### Note

When carrying out work on the fuel system, please adhere closely to the instructions in the Workshop Manual. If the sender-delivery unit is installed incorrectly, the fuel level may be falsely indicated, causing the vehicle to break down.

## Upshift indicator



392\_056

### Function

The upshift indicator in the driver information system is a new function which is designed to help the driver to reduce fuel consumption. The function is integrated in the engine management software. It is used on all petrol and diesel models with manual gearbox.

As modern vehicle engines deliver high torque even at low rpm, it is often possible to drive in a higher gear. In this case, a gearshift recommendation is indicated to the driver via the driver information system. The gearshift recommendation may involve skipping a gear.

The actual gear position is indicated continuously in the driver information system. This information is derived from the actual engine speed and road speed signals. Neither the actual gear position nor any gearshift recommendations are indicated while the clutch is actuated (for longer than 2 seconds). No gearshift recommendation is given when the engine is operating at full throttle either.

Normally no gearshift recommendation is issued when the vehicle is in overrun. However, if the engine speed drops below a critical threshold, a recommendation to shift down a gear will be given.

To implement the "upshift indicator" function, the engine control unit requires information from the steering angle sender G85, the ABS control unit J104 and the convenience system central control unit J393, in addition to its ECU parameters. The engine control unit receives this information via CAN bus.

### Indicator

The gearshift recommendation computed by the engine control unit is transmitted via CAN bus to the dash panel insert and displayed in the driver information system.

There are two possible states of the display:

1. The actual gear position is displayed with or without a gearshift recommendation.
2. No display. This is the case if the clutch is actuated for longer than 2 seconds or if the driver has deactivated the function on the MMI.

### Reference

For further information, please refer to SSP 393 "Audi A5 – Convenience Electronics and Driver Assist Systems".





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# Transmission

## Power transmission

### New engine-gearbox configuration

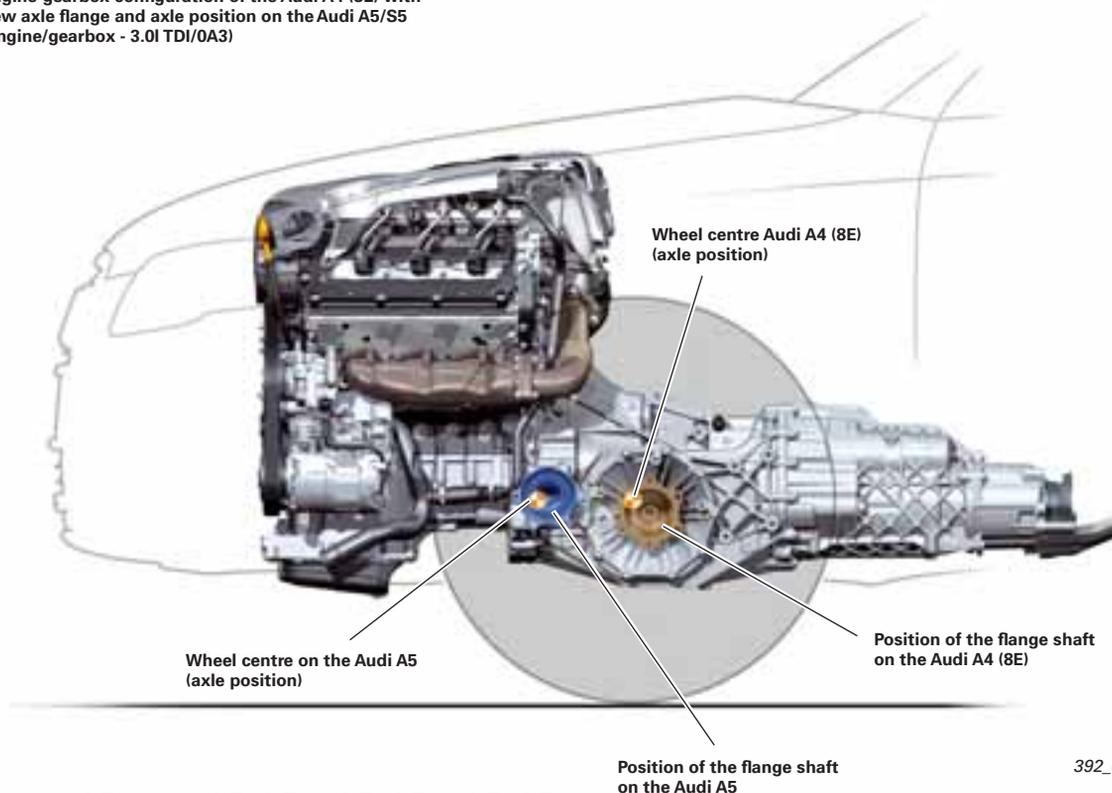
Newly developed manual and automatic gearboxes are used on the new Audi A5/S5.

Meeting the development goals of ...

- improved pedestrian safety,
- extended wheelbase,
- optimised axle load distribution,
- more precise handling,
- and a short front overhang,

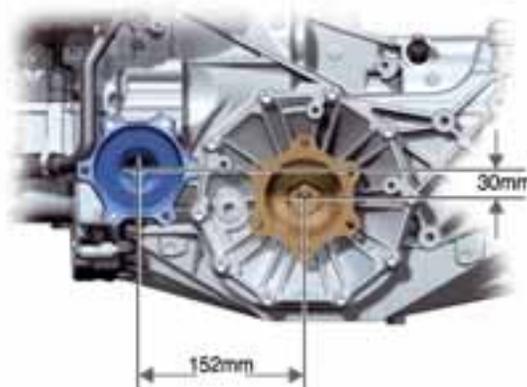
... made it necessary to adopt a new engine-gearbox configuration in the front section of the vehicle.

Engine-gearbox configuration of the Audi A4 (8E) with new axle flange and axle position on the Audi A5/S5 (engine/gearbox - 3.0l TDI/0A3)

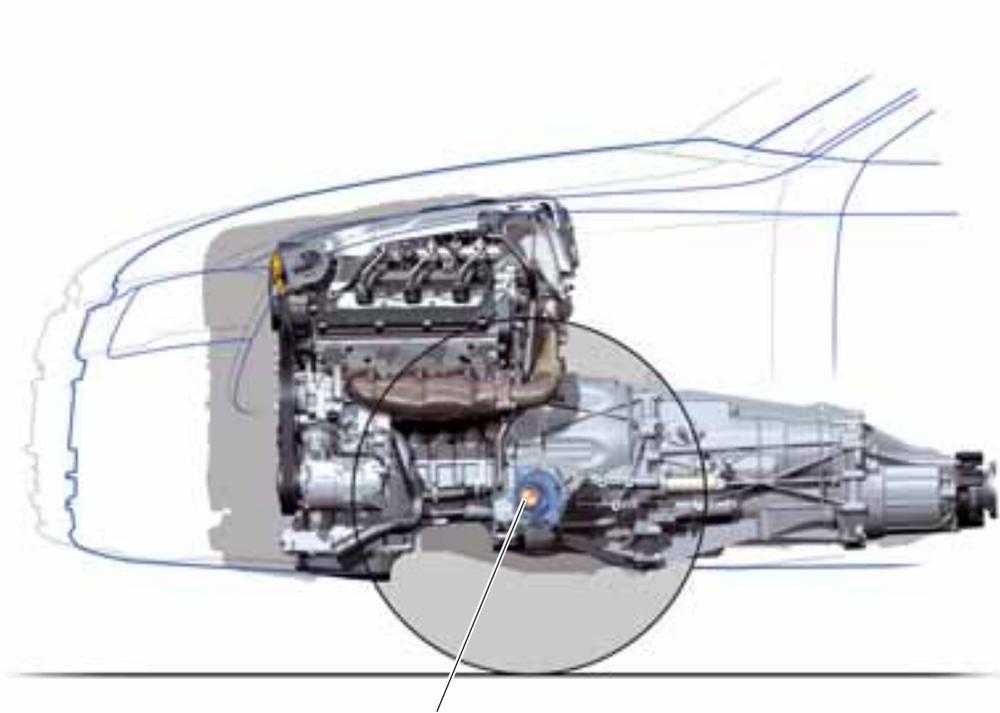


The new engine-gearbox configuration is only possible by moving the front axle drive (differential) forward of the clutch or torque converter.

The new positioning of the differential shifts the front axle flange shafts forwards 152 mm (on the Audi A8 it was 103 mm) and simultaneously approx. 30 mm upwards. The front axle flange shaft had to be additionally shifted upwards to accommodate the new steering gear position.



Silhouettes of the Audi A4 (8E) (grey) and the Audi A5 (blue) superimposed with the same axle position (engine/gearbox - 3.0I TDI/0B4)



Axle position Audi A4 (8E)/Audi A5/S5 (wheel centre)

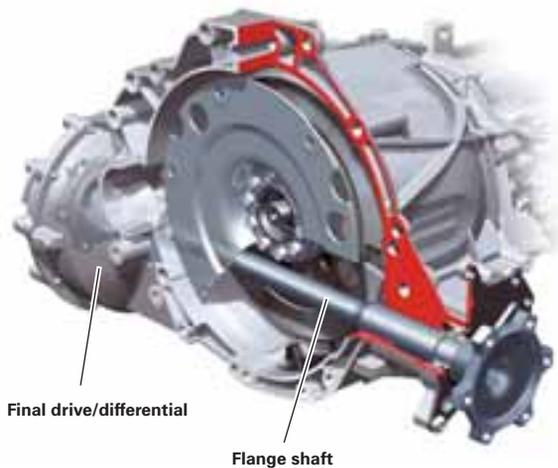
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This diagram shows how the specified development goals have been met by virtue of the new engine-gearbox configuration.

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In all gearboxes, the new position of the differential is now on the right-hand side in the direction of travel projecting beyond the gearbox flange. Similar to the automatic gearbox 09E introduced on the Audi A8 (D3) in mid 2000. refer to SSP 283.

As shown in the illustration on the right, the flange shaft is very close to the gearbox flange.



Final drive/differential

Flange shaft

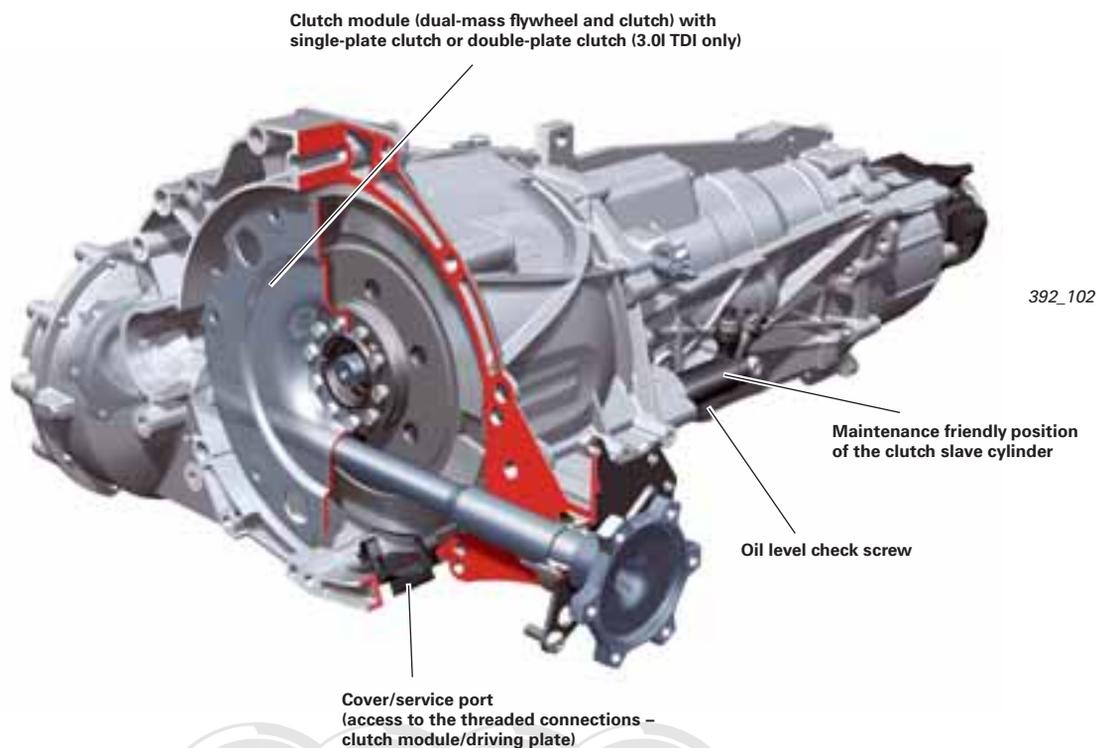
392\_101

# Transmission

## Manual gearboxes

In general, only six-speed manual gearboxes are used. There are two gearbox series, each of which is available in front and four wheel drive versions. Manual gearbox OB4 will be used at the start of production. In the course of model updating, the following manual gearboxes will be introduced depending on engine type. The illustration shows the OB4 gearbox. The OB3 gearbox identical to the OB4 gearbox, apart from the quattro modifications (one and the same gearbox series).

Gearbox OB2 - the quattro version - and the OB1 gearbox - the front wheel drive version - are based on the same basic concept as the OB4/OB3 gearbox, but differ with respect to a number of design details, dimensions and specifications. Gearboxes OB2 and OB1 form a further, separate gearbox series. The special codes shown here apply to both gearbox series.



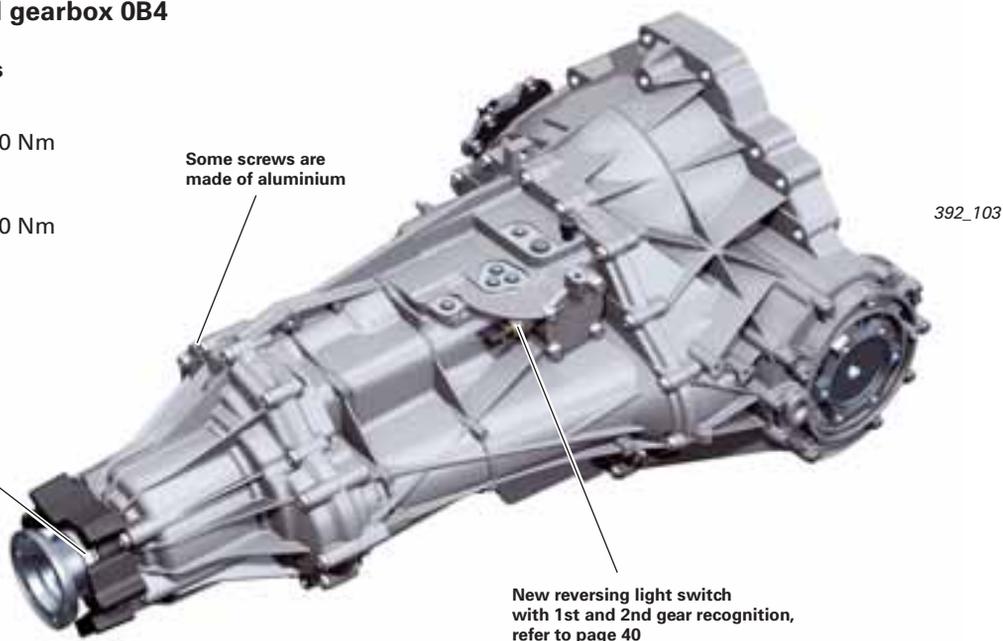
### Six-speed manual gearbox OB4

#### Engine combinations

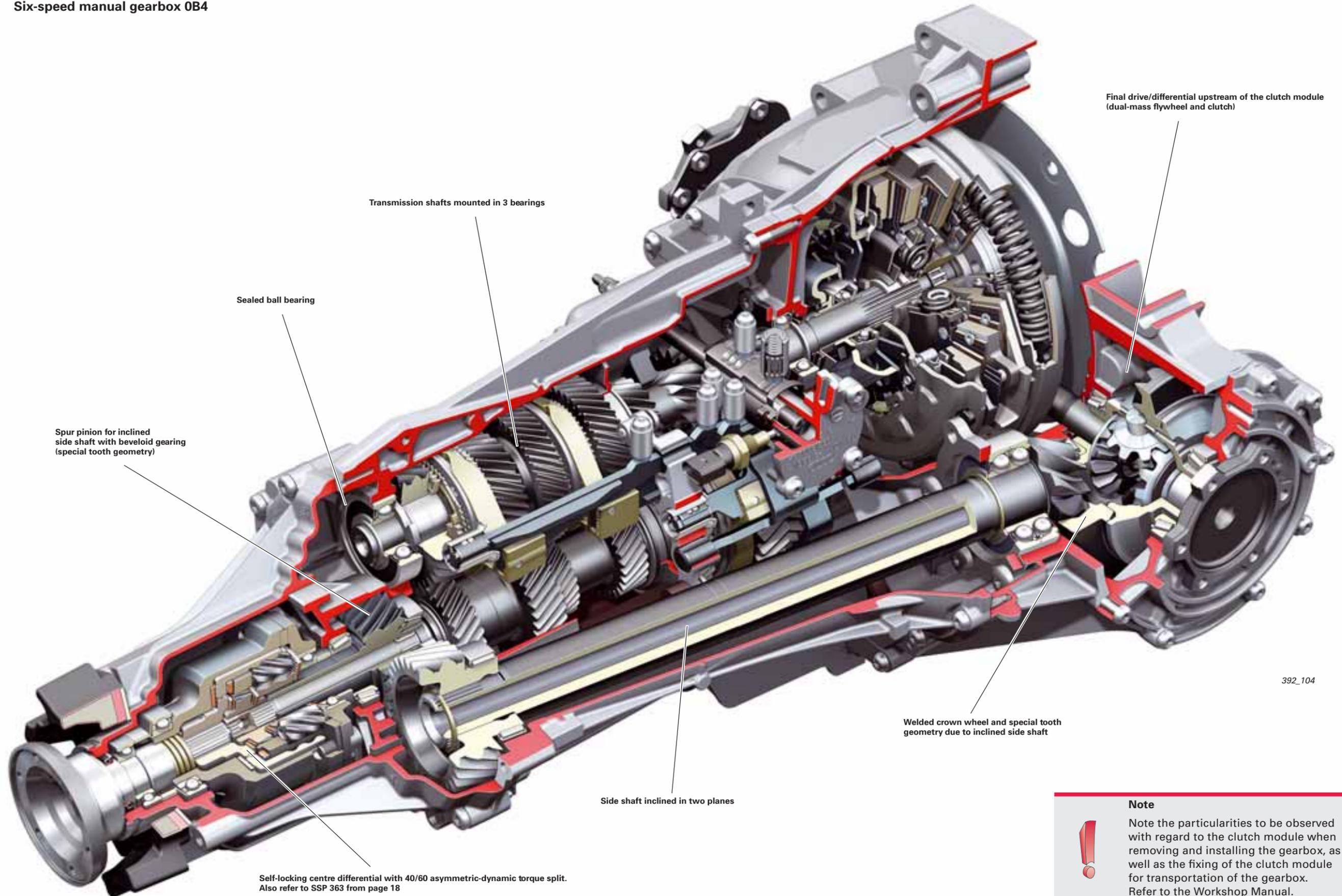
**4.2l FSI V8/4V**  
260 kW (353 bhp), 440 Nm

**3.0l TDI CR V6/4V**  
175 kW (238 bhp), 500 Nm

Press fit gauge for all shaft oil seals, refer to SSP 363 page 31



## Six-speed manual gearbox 0B4



392\_104

### Note



Note the particularities to be observed with regard to the clutch module when removing and installing the gearbox, as well as the fixing of the clutch module for transportation of the gearbox. Refer to the Workshop Manual.

# Transmission

## Six-speed manual gearbox 0B3

### Engine combinations

#### 2.7I TDI CR V6/4V

140 kW (191 bhp), 380 Nm

to be introduced at a later date



392\_105



392\_106

## Six-speed manual gearbox 0B2

### Engine combinations

#### 3.2I FSI V6/4V AVS

195 kW (265 bhp), 330 Nm

to be introduced at a later date

#### 2.0I TFSI R4/4V AVS

155 kW (211 bhp), 350 Nm

to be introduced at a later date



392\_107



392\_108

## Six-speed manual gearbox 0B1

### Engine combinations

#### 1.8I TFSI R4/4V

125 kW (170 bhp), 250 Nm to be introduced at a later date

#### 2.0I TDI CR R6/4V

120 kW (163 bhp), 350 Nm to be introduced at a later date



392\_109



392\_110

### Specifications Manual gearboxes

Service code	0B4	0B3	0B2	0B1
Manufacturer code	ML451-6Q	ML351-6F	ML311-6Q	ML311-6F
Development/manufacturer	Getrag, Audi/Getrag		Audi/VW-Kassel	
Weight (excluding oil, without clutch)	86.1 (V8 4.2 FSI) 88.2 (V6 3.0 TDI)	77.1	78.6	68
Max. torque in Nm	500	400	350	
Shaft spacing in mm	82		77.35	
Oil capacity in l	3.5 (V8 FSI) 3.8 (V6 TDI)	3.5	4.33	3.8
Housing	3-piece Aluminium with bolted sheet-steel bearing support		3-piece Aluminium with bolted sheet-steel bearing support	
Synchromesh	with triple-cone synchroniser on 1st and 2nd gear with double-cone synchronisers on 3rd to 6th gear		Triple-cone synchronizer on 1st gear Double-cone synchronizer on 2nd gear Single outer cone synchronizer (Audi system) on 3rd to 6th gear and reverse	
Gearbox ratio spread	6-speed currently up to 6.8 (up to 7.5 theoretically possible)		6-speed currently up to 6.0 (up to 7.5 theoretically possible)	
Four-wheel drive/ torque split	quattro 40/60		quattro 40/60	

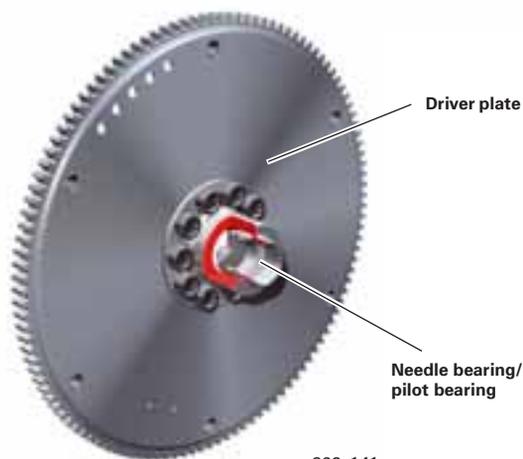
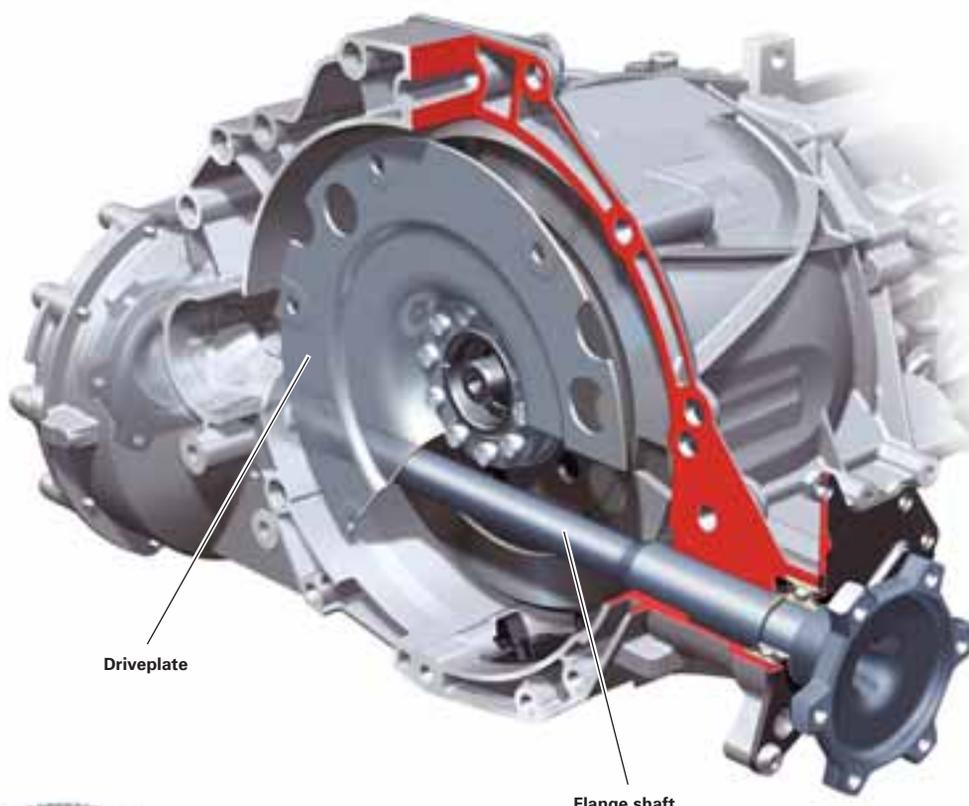
## Clutch module

The new position of the differential required, in addition to the modifications to the gearboxes, a new clutch and dual-mass flywheel design. The dual-mass flywheel and the clutch form a unit, the so-called clutch module.

The clutch module is now mounted into the clutch bell housing before the engine and gearbox are assembled. The threaded connection to the crankshaft is made by means of a driving plate, as is the case with automatic gearboxes. Before removing and installing the clutch module, the left flange shaft must be removed.

The threaded connection between the clutch module and the driving plate is made by means of a shaped metal plate - the so-called driveplate - in such a manner that the clutch module is shifted further back to create the space required to accommodate the left flange shaft.

As a result of this ingenious solution, the complete drive unit is now closer to the centre of the vehicle. The resulting advantages derive from the development aims listed on page 30.



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### Note

The repair procedures for the new gearbox generation and the new clutch module are different in several respects (refer to the Workshop Manual).

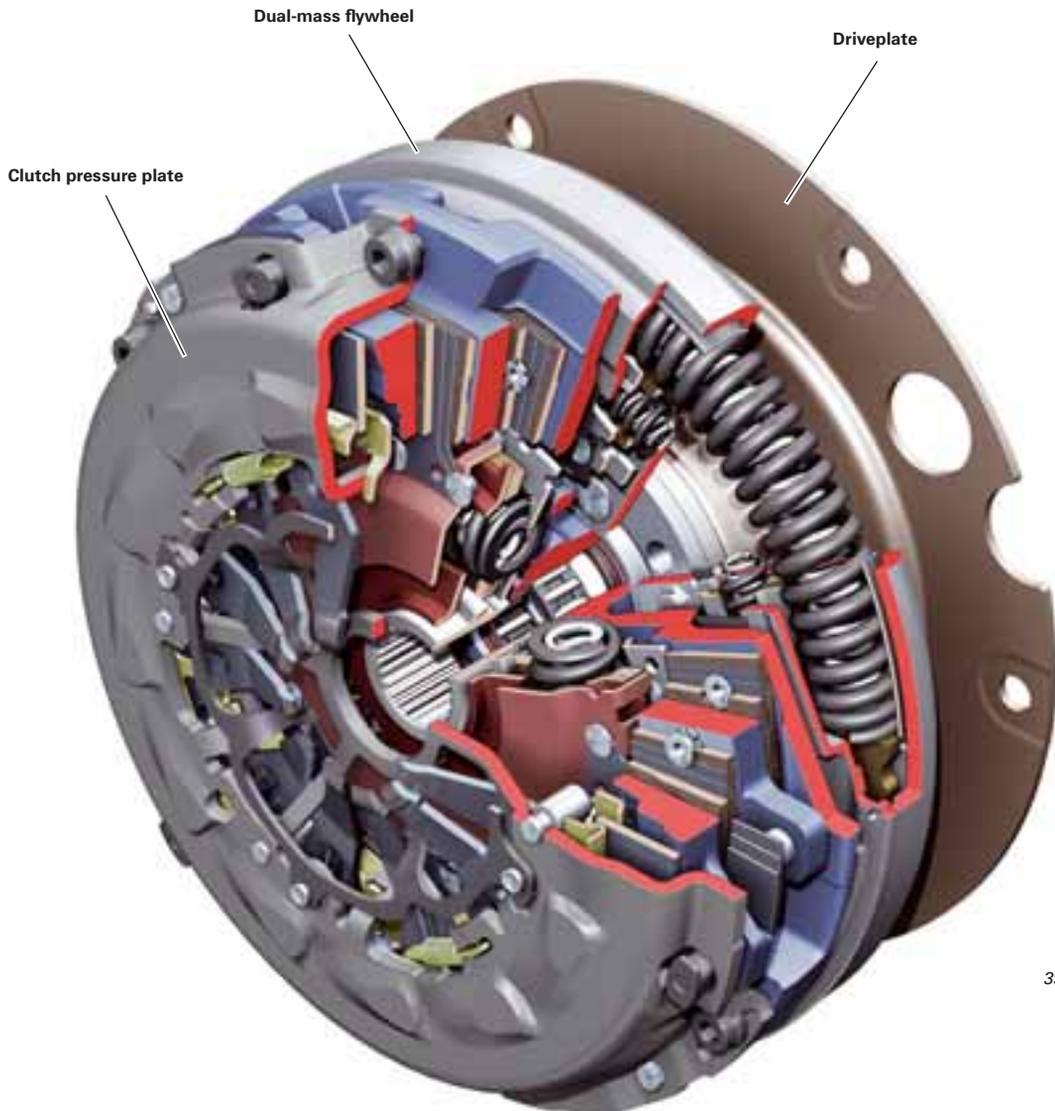
## Double-plate clutch

A special feature is the double-plate clutch. The double-plate clutch is currently used only in the OB4 gearbox in combination with the 3.0l TDI engine.

The Advantage of a double-plate clutch is the high amount of torque transmissible and durability combined with relatively small diameter. As shown, there is an intermediate plate between the two clutch plates. This creates four friction surfaces which are capable of transmitting twice as much torque as a single-plate clutch of identical size and contact pressure.

Needless to say, the double-plate clutch has a self-adjusting clutch pressure plate.

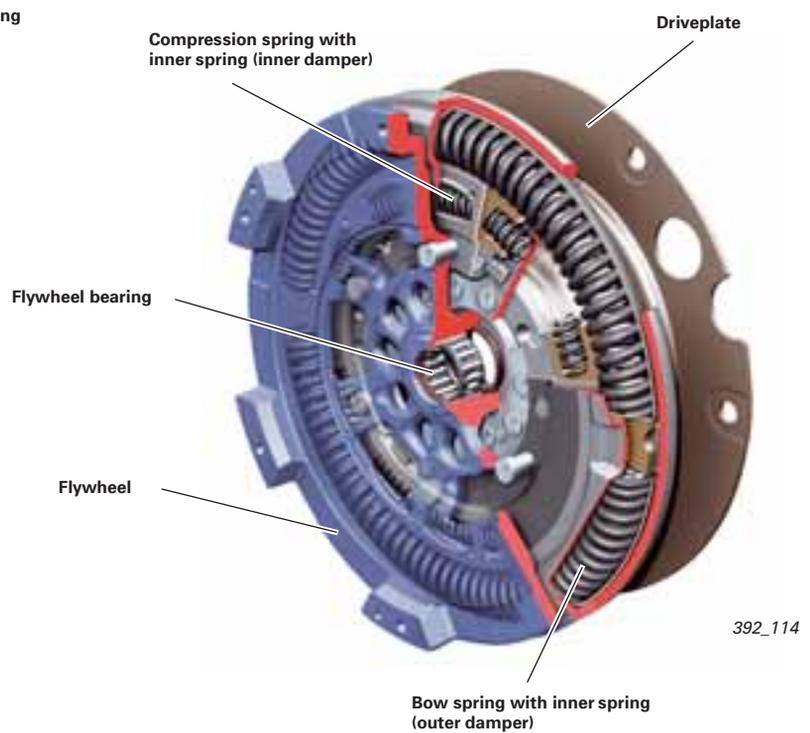
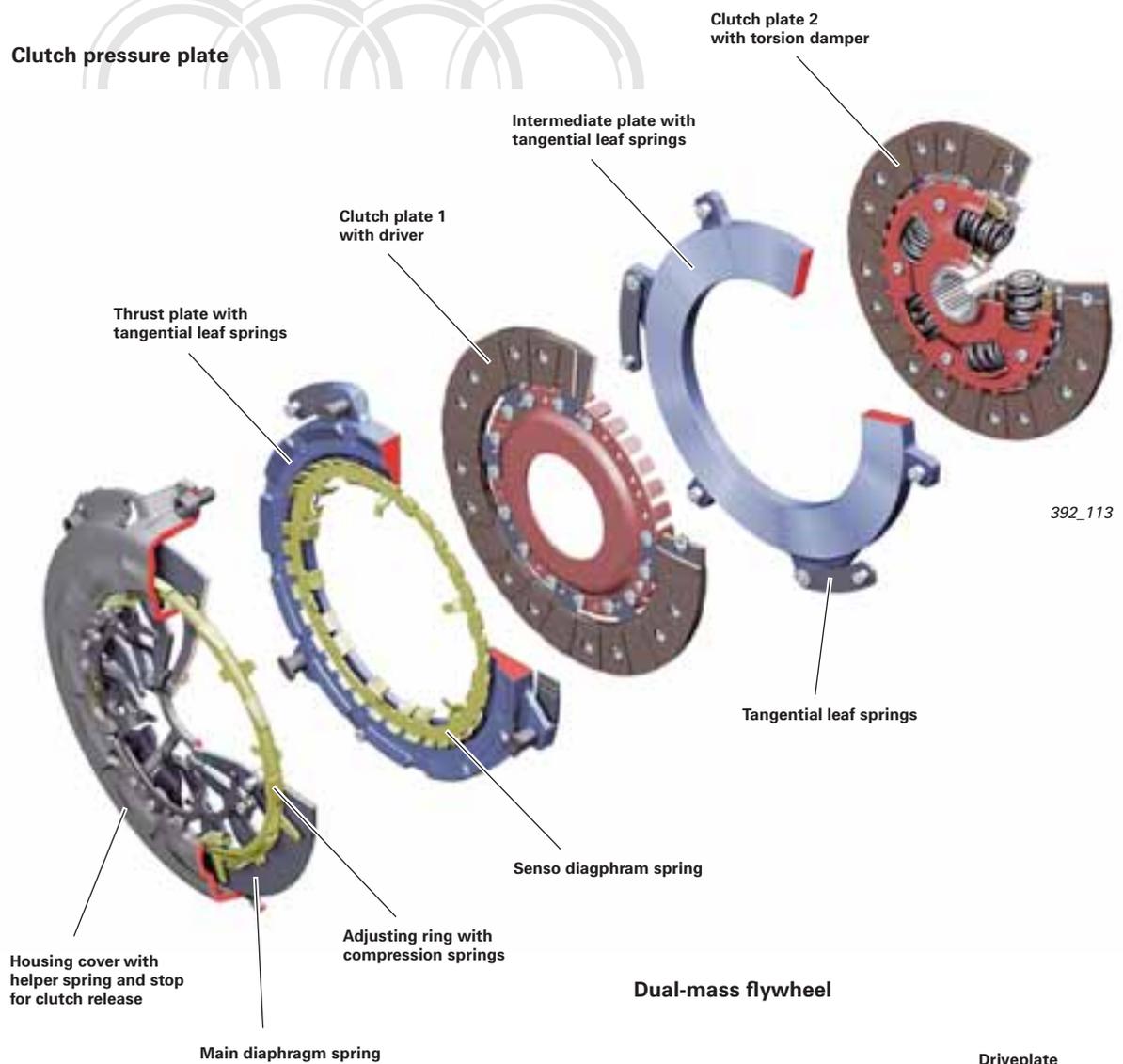
To minimise the size and weight of the double-plate clutch despite the large number of components involved, one of the two clutch plates is integrated into the clutch pressure plate. They therefore cannot be replaced separately. When replacing a clutch, it is necessary to replace the clutch pressure plate as well.



392\_112

# Transmission

## Components of the double-plate clutch



## Clutch module versions

As previously, clutch pressure plates are available with/without self-adjustment and there are two versions of the self-adjusting clutch pressure plates.



392\_115



392\_116



392\_117

By way of example, several versions of the clutch module are listed below in order to highlight the typical differences.

### Single-plate clutch (4.2I V8 FSI)

- Systems supplier LuK
- Diameter of clutch plate 240 mm with torsion damper
- Clutch pressure plate with adjustment system "SAC" by LuK. These pressure plates can, and must, generally be reset when only the clutch plate is replaced.
- Single-stage dual-mass flywheel
- Weight 20.4 kg

### Double-plate clutch (3.0I V6 TDI)

- Systems supplier LuK
- Diameter of clutch plates 2x 228 mm with torsion damper
- Clutch pressure plate with adjustment system "SAC" by LuK.
- Two-stage dual-mass flywheel
- Weight 21.3 kg

#### Note



As one of the two clutch plates is a component part of the clutch pressure plate, the clutch pressure plate must always be replaced together with the 2nd clutch plate when replacing the clutch (same part number).

### Single-plate clutch (2.0I TDI)

- Systems supplier ZF Sachs
- Diameter of clutch plate 240 mm without torsion damper
- Clutch pressure plate with adjustment system "XTend" by ZF Sachs. These pressure plates cannot be reset. They have to be replaced together with the clutch plate.
- Single-stage dual-mass flywheel
- Weight 17.6 kg

#### Reference



For information about the "SAC" clutch pressure plate, please refer to SSP 198. For further information about the clutch module, refer to the forthcoming self-study programmes on the new "gearbox generation".

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# Transmission

## Reversing light switch F4

The reversing light switch F4 is a so-called double-stroke switch with two switches, "R" and "V".

Switch "R" is required for the following functions:

- Activation of the reversing lights
- Automatic dimming rear view mirror/ exterior mirror (and fold-back function) control unit
- Trailer control unit
- Hill Start Assist (electric parking brake)
- Audi hold assist (ESP)

Switch "V" is required for the following functions:

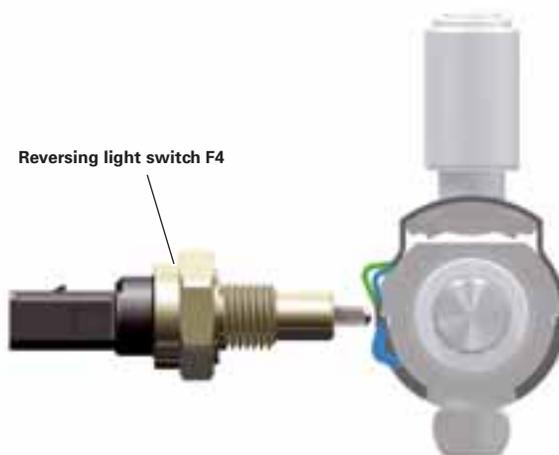
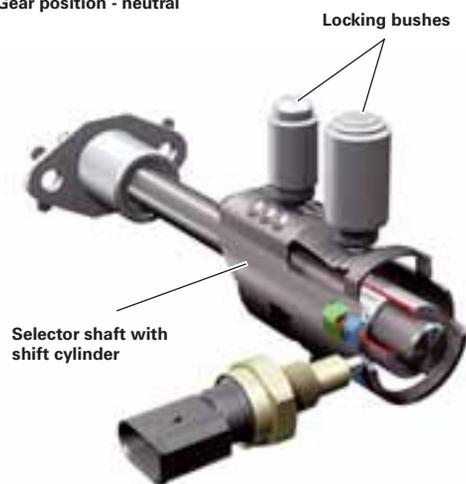
- Hill Start Assist (electric parking brake)
- Audi hold assist (ESP)

### Information path:

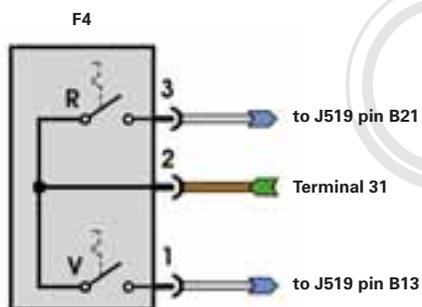
F4 > discrete line > J519 onboard power supply control unit > convenience CAN bus > J533 gateway > \*

\* for information on the corresponding control units and the associated bus system, refer to CAN topology.  
J519 conditions the signals from switches "R" and "V" accordingly and sends a corresponding message to the gateway.

Gear position - neutral

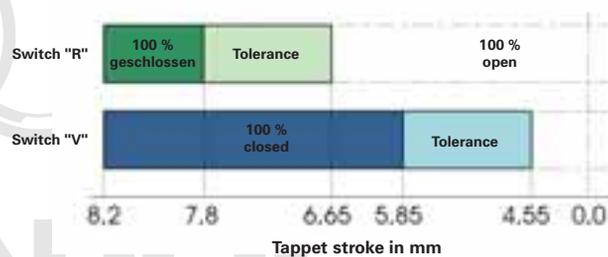


392\_118



392\_119

Shift matrix - switch position/tappet stroke



392\_120

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F4 Reversing light switch  
J519 Onboard power supply control unit

### Note



Special tool T40138 are available for removing the connector from switch F4. Test cable VAS 5257 is available for testing switch F4.

**Gear position - 1st gear**

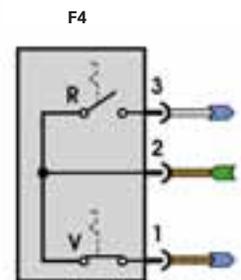


392\_124

**Gear positions - 2nd gear**



392\_123



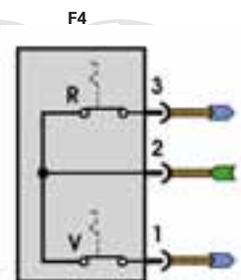
392\_122

Switch "V" is closed when 1st gear or 2nd gear is engaged (and when reverse gear is engaged). It supplies an earth signal to the onboard power supply control unit J519 (containing the information "1st or 2nd gear engaged/forward drive"). In all other gears, the switch is "open".

**Gear position - reverse**



392\_121



392\_125

Switch "R" is closed when reverse gear is engaged. It supplies an earth signal to the onboard power supply control unit J519 (containing the information "reverse gear engaged/ reverse travel"). In all other gears, the switch is "open".

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# Transmission

## Automatic transmission

### multitronic 0AW

Again, all vehicles with automatic gearbox and front-wheel drive are equipped with multitronic. The multitronic system had to be modified for use on the Audi A5 due to the repositioning of the differential. Proven components have been further optimised.

The improved driving program underscores the sporty characteristics of the Audi A5.

The proven CVT mode is used in driving program "D".

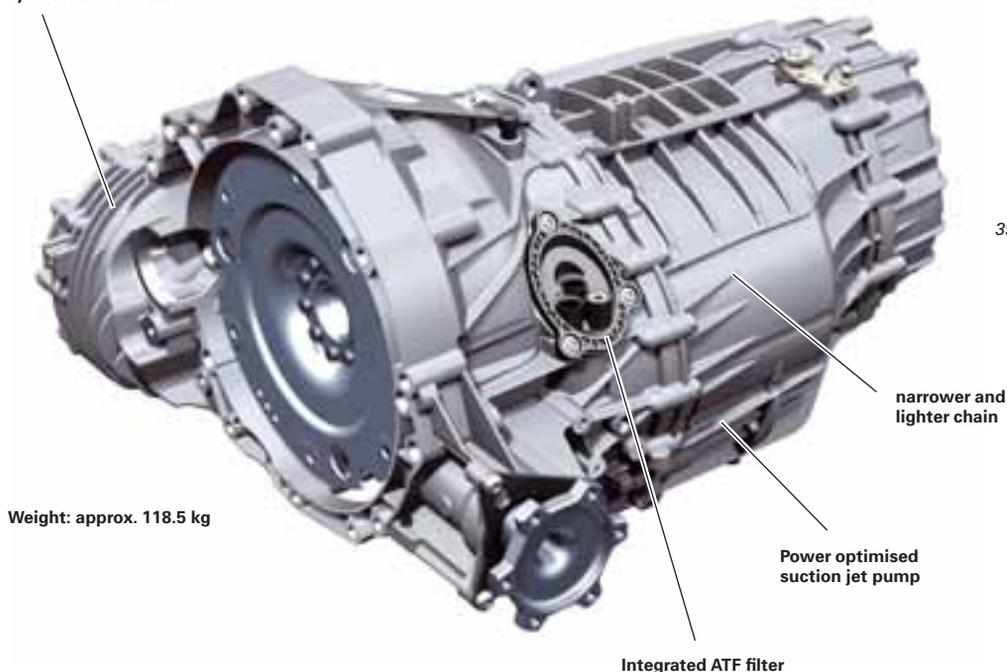
An eight-speed variant is used in tiptronic mode, see also SSP 325 on page 89.

In driving program "S", eight stepped ratios are used. This enhances the engine speed dynamics from the driver's point of view.

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Maximum gearbox input torque is 380 Nm.

Final drive/differential upstream of the dual-mass flywheel and the clutch



### Engine combinations

#### 3.2l FSI V6/4V AVS

195 kW (265 bhp), 330 Nm to be introduced at a later date

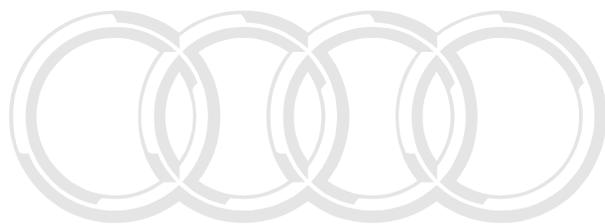
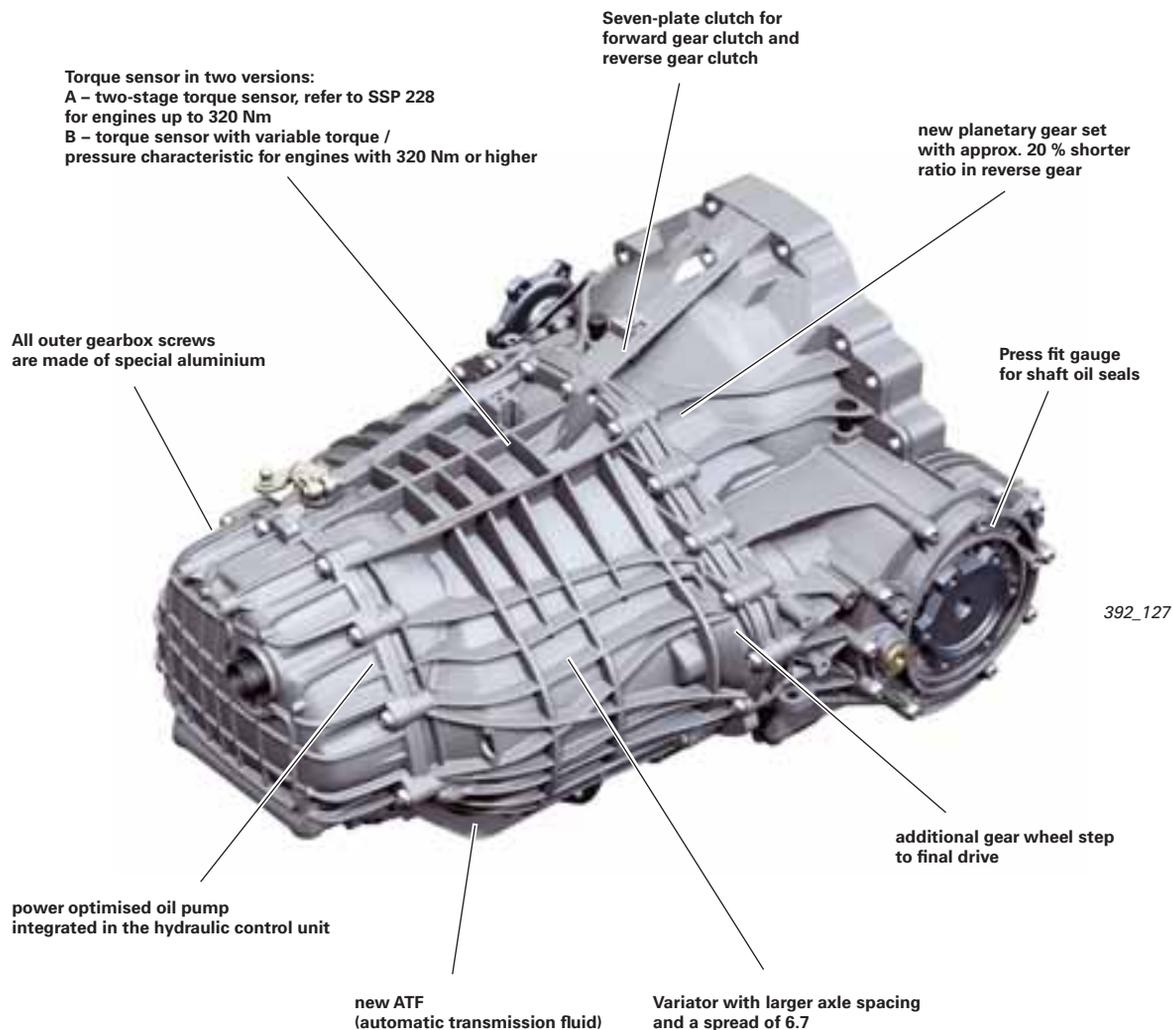
#### 2.7l TDI CR V6/4V

140 kW (191 bhp), 380 Nm to be introduced at a later date

120 kW (163 bhp), 380 Nm to be introduced at a later date

#### 1.8l TFSI R4/4V

125 kW (170 bhp), 250 Nm to be introduced at a later date



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**Reference**



For further information about the new "multitronic 0AW", please refer to the accompanying self-study programme. For further information on the multitronic 01J, please refer to SSP 228.

# Transmission

## Six-speed automatic gearbox 0B6

Vehicles with quattro four-wheel drive and automatic gearbox are equipped with the new six-speed automatic gearbox 0B6 by systems supplier ZF Getriebe GmbH.

The 0B6 gearbox is a further development of the 09E gearbox, refer to SSP 283/284.

Torque capacity is defined at 580 Nm for petrol engines and 650 Nm for diesel engines.

The 0B6 gearbox is a derivative of the new second generation six-speed automatic gearbox series. ZF, working in conjunction with Audi's engineers, adapted the gearbox to new engine-gearbox configuration of the Audi A5.

The second generation six-speed automatic gearbox by ZF is notable in particular for its extremely short reaction times. The shift dynamics are about 50 percent better, which in turn significantly increases the driving dynamics.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee the correctness of information in this document. Copying is prohibited. **Self-locking centre differential with asymmetric dynamic 40/60 torque split**

Final drive/differential upstream of the torque converter



392\_128

The use of a new two-damper converter in the diesel engine allows the lockup clutch to close earlier. This in turn improves fuel economy and provides a more direct driving dynamic.

The new mechatronics allow extremely short reaction times.

### Engine combinations

#### 3.2I FSI V6/4V AVS

195 kW (265 bhp), 330 Nm to be introduced at a later date

#### 4.2L FSI V8/4V

260 kW (353 bhp), 440 Nm to be introduced at a later date

#### 3.0I TDI CR V6/4V

176 kW (240 bhp), 500 Nm to be introduced at a later date

### Reference

For further information about the new automatic gearbox 0B6, please refer to the accompanying self-study programme.



## Removing and installing the gearbox

Before detaching the gearbox from the engine, the threaded connection between the driveplate and the driving plate must be undone.

To facilitate this assembly procedure, all gearboxes now have a large port on the base of the gearbox bell housing. The starter does not have to be removed.

The "service port" is sealed by a plastic cover.

### Note



Due to the new gearbox generation and of the new clutch module, there are several new repair procedures. Please refer to the Workshop Manual for details.



Service port with cover

392\_129



Service port with cover  
(view from below)



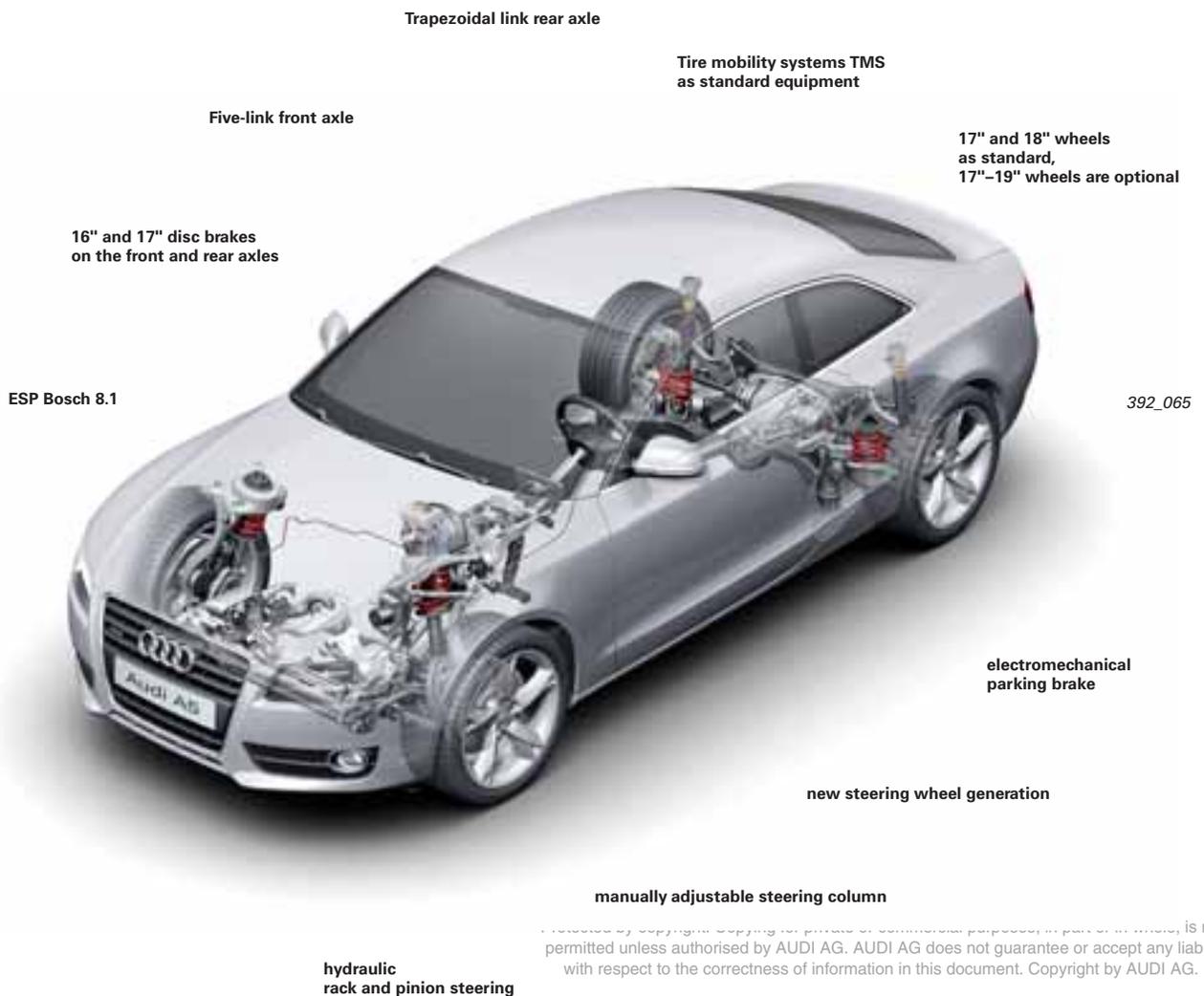
392\_130

# Suspension system

## Overview

Four suspension versions are used on the Audi A5. Suspension 1BA is basic equipment. A sports suspension 1BE will be optional. Both suspension versions have the same ride height, but different springs, shock absorbers and anti-roll bars.

A suspension system with electronic damping control 1BL is a third option. This feature allows the driver to select between comfortable and sporty suspension setups at the touch of a button. quattro GmbH offers an S-Line suspension 1BV. It has an even more sporty suspension setup than the sports suspension, and ride height is 10 mm lower.



### Reference

For information about the design and function of the suspension system of the Audi A5, please refer to SSP 394 Audi A5 – Suspension.



## Front axle

A newly developed five-link front axle is used. In comparison with the current Audi A4, the front axle is 152 mm further forward on the vehicle. This optimises axle load distribution and reduces the front overhang, giving the car a more dynamic look.

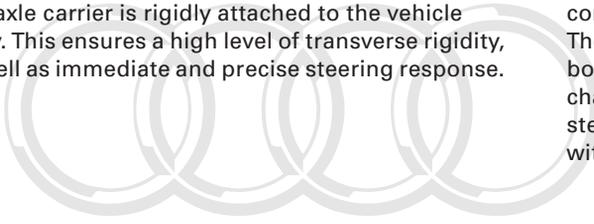
The steering gear is now bolted to the axle carrier. The track rod functions as the fifth wishbone. The axle carrier is rigidly attached to the vehicle body. This ensures a high level of transverse rigidity, as well as immediate and precise steering response.

The kingpin inclination angle and the castor angle have been enlarged compared to the current Audi A4.

The new axle geometry provides good self-centring of the steering system when travelling in a straight line.

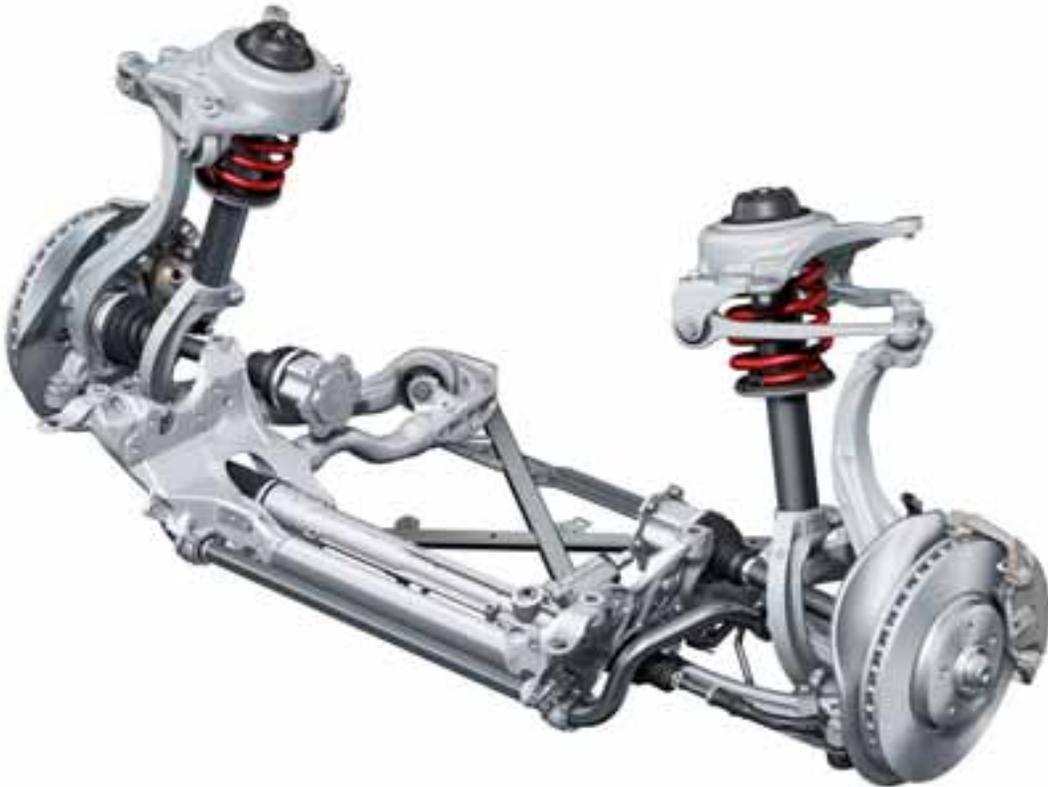
The suspension kinematics have been designed with the aim of achieving the smallest possible turning circle despite the much larger wheelbase compared to the current Audi A4.

The design and geometric arrangement of the wishbone bearing components provide sporty handling characterised by exceptional agility, outstanding steering precision and excellent driving stability to within the vehicle's dynamic limit range.



# Audi

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392\_066

# Suspension system

## Rear suspension

A newly developed trapezoidal link rear axle is used on the Audi A5. Variants are available for front wheel drive and quattro drive.

They differ only with regard to the axle carriers, wheel carriers and wheel bearings. The development aim was to create a compact axle requiring a minimum of installation space. The result is a high luggage compartment volume, as well as a large through-loading width and a low boot floor.

The kinematic axle design provides good anti-dive behaviour.

The spatial arrangement of the wishbones and the design of the link bearings results in increased toe angle under bump, lateral and longitudinal forces. This track stabilising feature provides high driving safety and driving stability to within the vehicle's dynamic limit range.

Rear axle for front-wheel drive



392\_068

Rear axle of quattro models



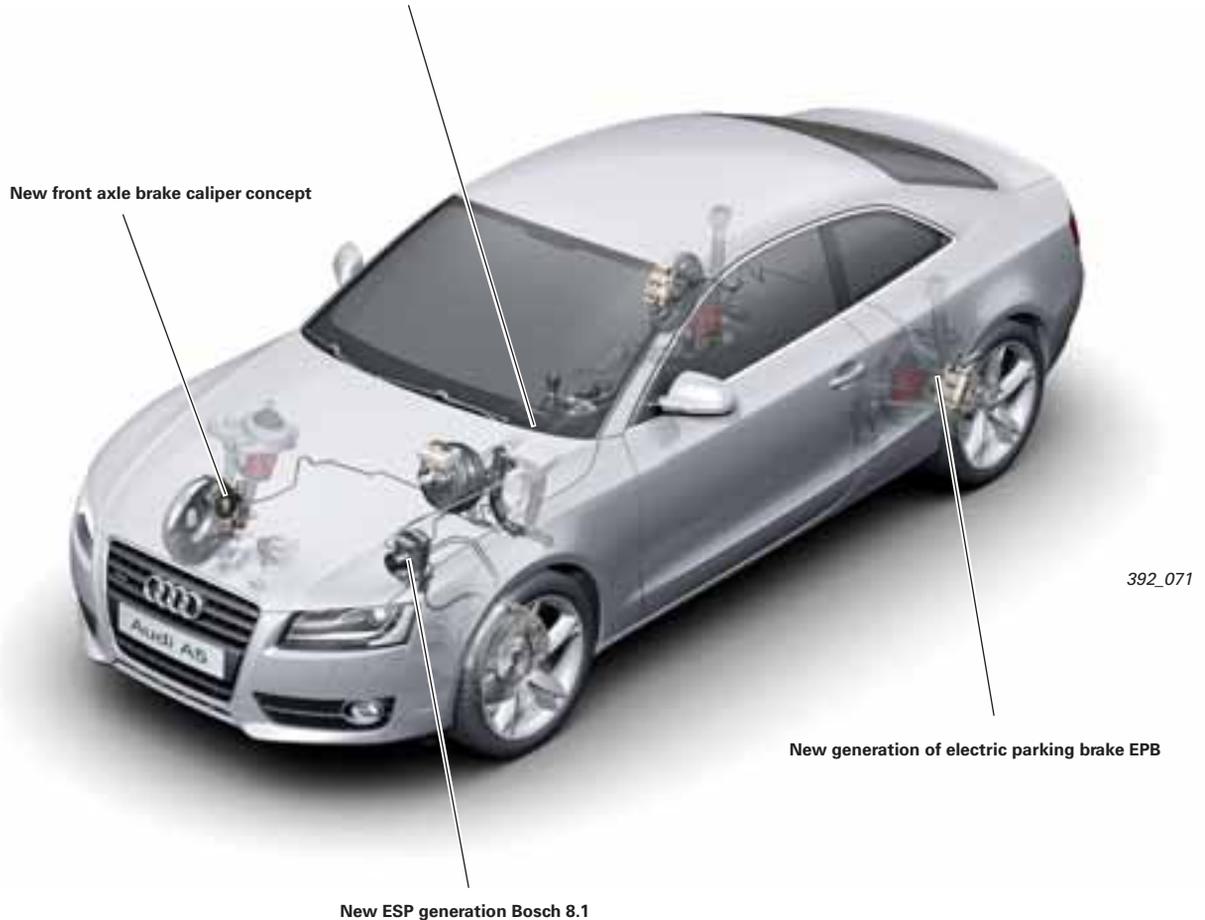
392\_069

## Brake system

The brake system of the Audi A5 is generously specified to ensure high performance as well as optimum stability.

# Audi

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### Audi hold assist

This new function is used for the first time on the Audi A5. It is an optional convenience function.

Its basic function is to hold the vehicle stationary on a gradient. To achieve this, the ESP system actively builds up brake pressure at all four wheels. The activated ESP solenoid valves heat up when the vehicle is stationary for lengthy periods of time.

When the temperature of the solenoid valves exceeds approx. 200 °C, the braking function is transferred to the electric parking brake. This is a precaution to avoid damaging the coils of the ESP solenoid valves. When the driver wishes to set off again, the brake is not released until sufficient engine torque is available, in order to prevent the vehicle from rolling back.

# Suspension system

## Wheel brakes overview

Front axle



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392\_132

<b>Engine</b>	3.0l TDI	V8 4.2l FSI
<b>Minimum wheel size</b>	16"	17"
<b>Brake type</b>	TRW FBC-57 16"	TRW FBC-57 17"
<b>Number of pistons</b>	1	1
<b>Piston diameter in mm</b>	57	57
<b>Brake disc diameter in mm</b>	320	347

## Rear suspension



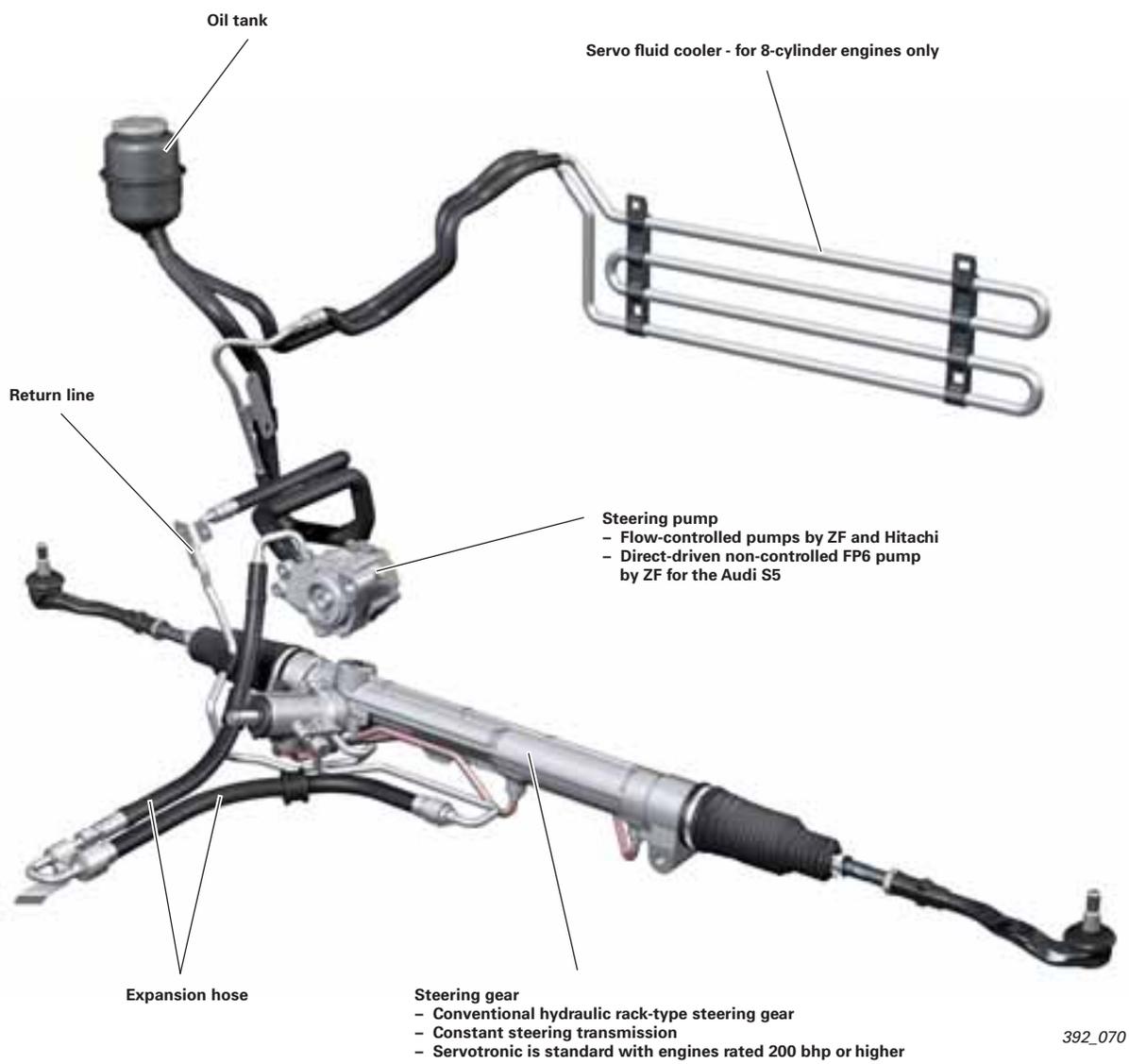
392\_133



392\_134

<b>Engine</b>	3.0l TDI	V8 4.2l FSI
<b>Minimum wheel size</b>	16"	17"
<b>Brake type</b>	TRW CII-43 EPB 16"	TRW CII-43 EPB 17"
<b>Number of pistons</b>	1	1
<b>Piston diameter in mm</b>	43	43
<b>Brake disc diameter in mm</b>	300	330

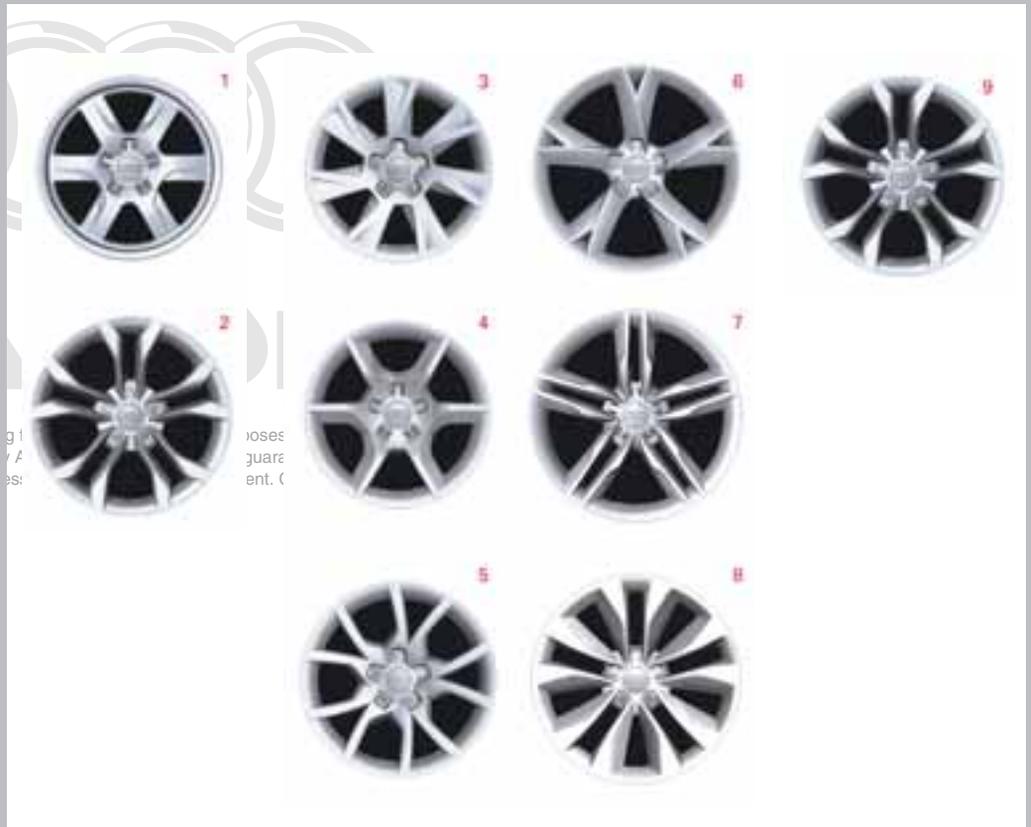
# Steering system



392\_070

# Suspension system

## Wheels and tyres



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Engine	Basic wheels	Optional wheels		Winter wheels
4 and 6 cylinder	7.5J x 17 H2 ET28 (1) Forged aluminium wheel snow chain compatible 225/50 R17	7.5J x 17 H2 ET28 (3) Cast aluminium wheel snow chain compatible 225/50 R17	8.5J x 19 H2 ET28 (6) Cast aluminium wheel 255/35 R19	8.5J x 18 H2 ET31 (9) Cast aluminium wheel snow chain compatible 245/40 R18
		8J x 17 H2 ET26 (4) Cast aluminium wheel 245/40 R17	8.5J x 19 H2 ET32 (7) Cast aluminium wheel 255/35 R19 Chrome	
		8.5J x 18 H2 ET29 (5) Cast aluminium wheel 245/40 R18		
8-cylinder	8.5J x 18 H2 ET29 (2) Cast aluminium wheel 255/50 R18		8.5J x 19 H2 ET32 (8) Cast aluminium wheel, manufactured by flow- forming 255/35 R19	

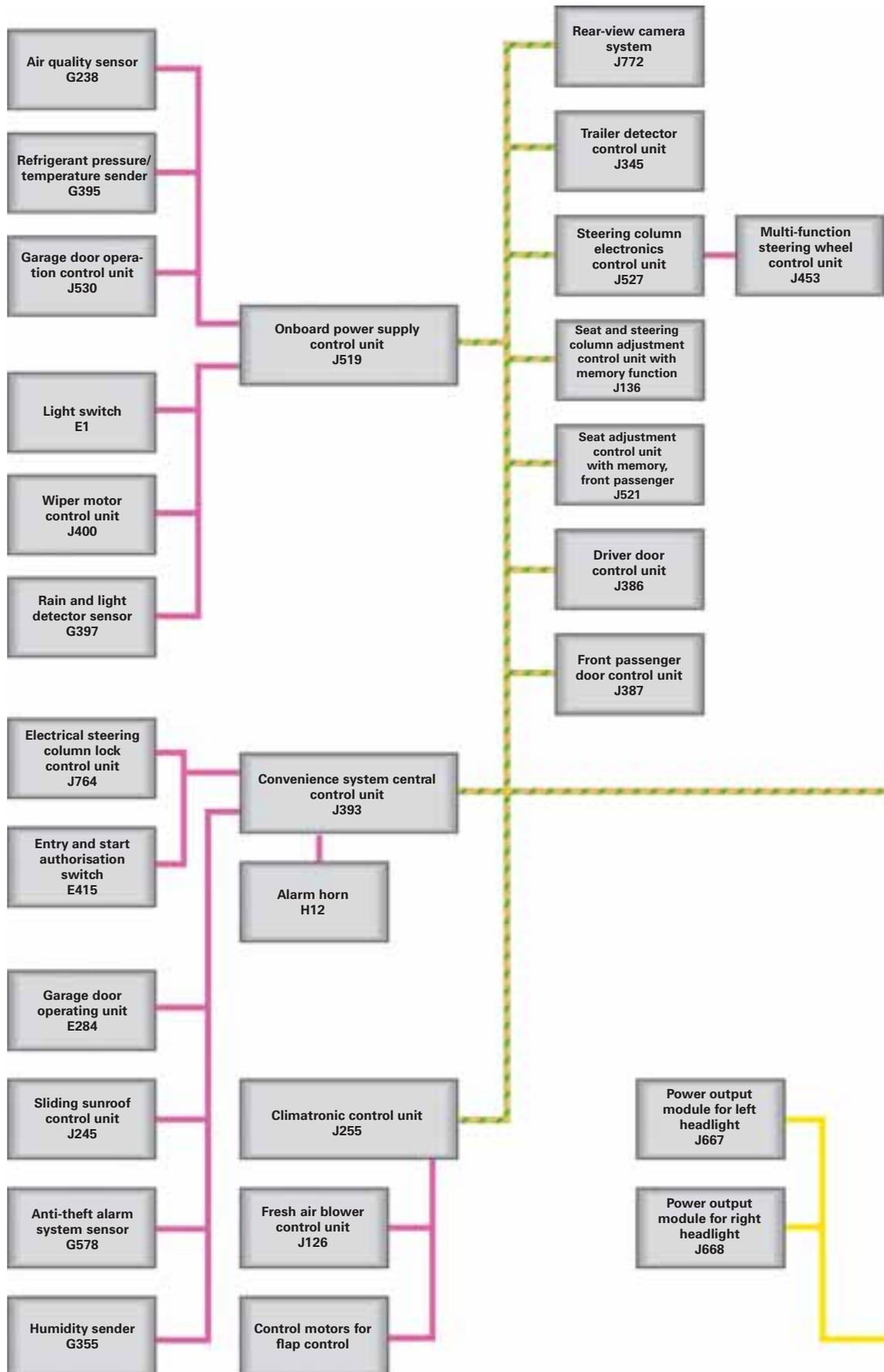


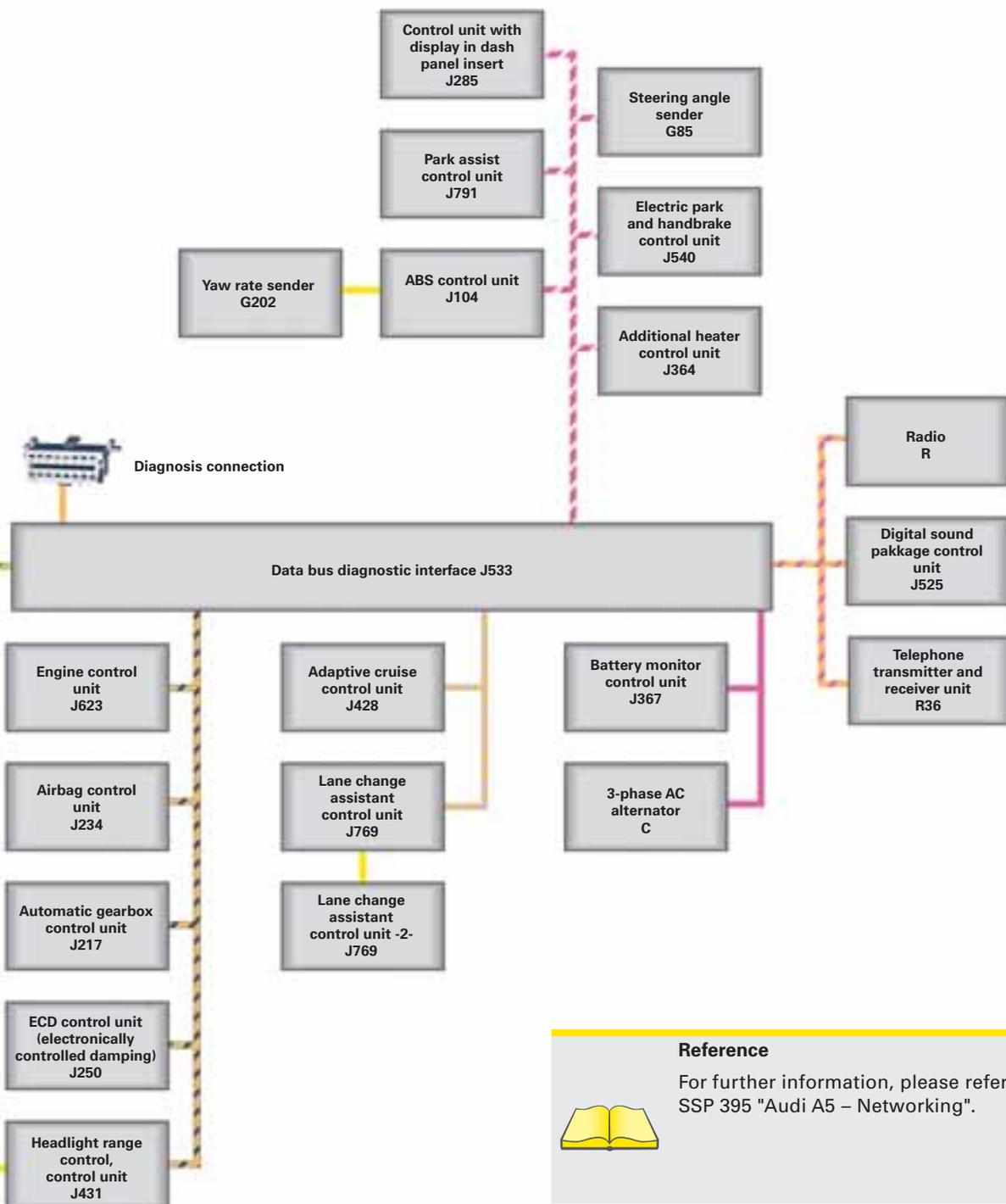
**Audi**

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# Electrical System

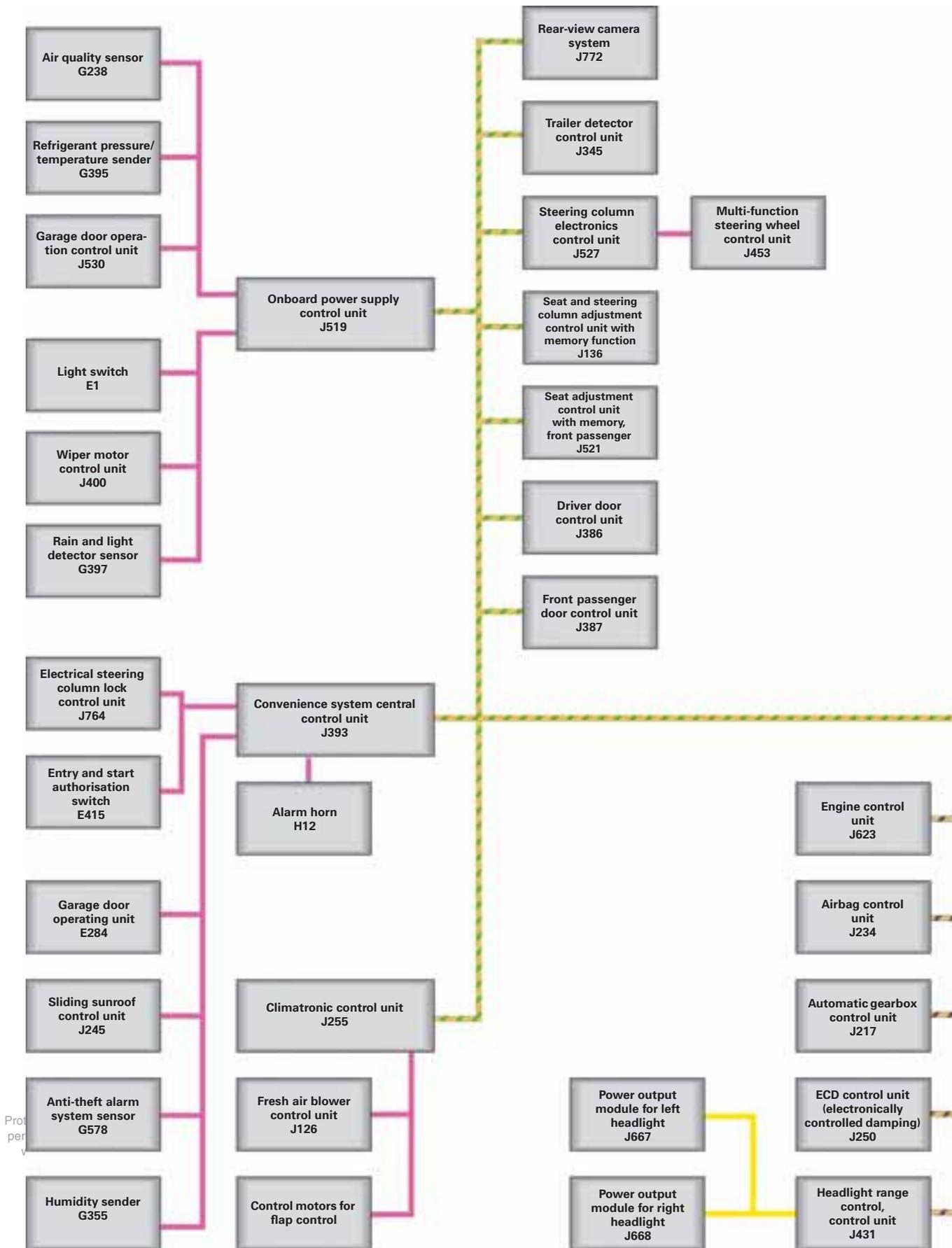
## Networking - vehicles with infotainment CAN bus





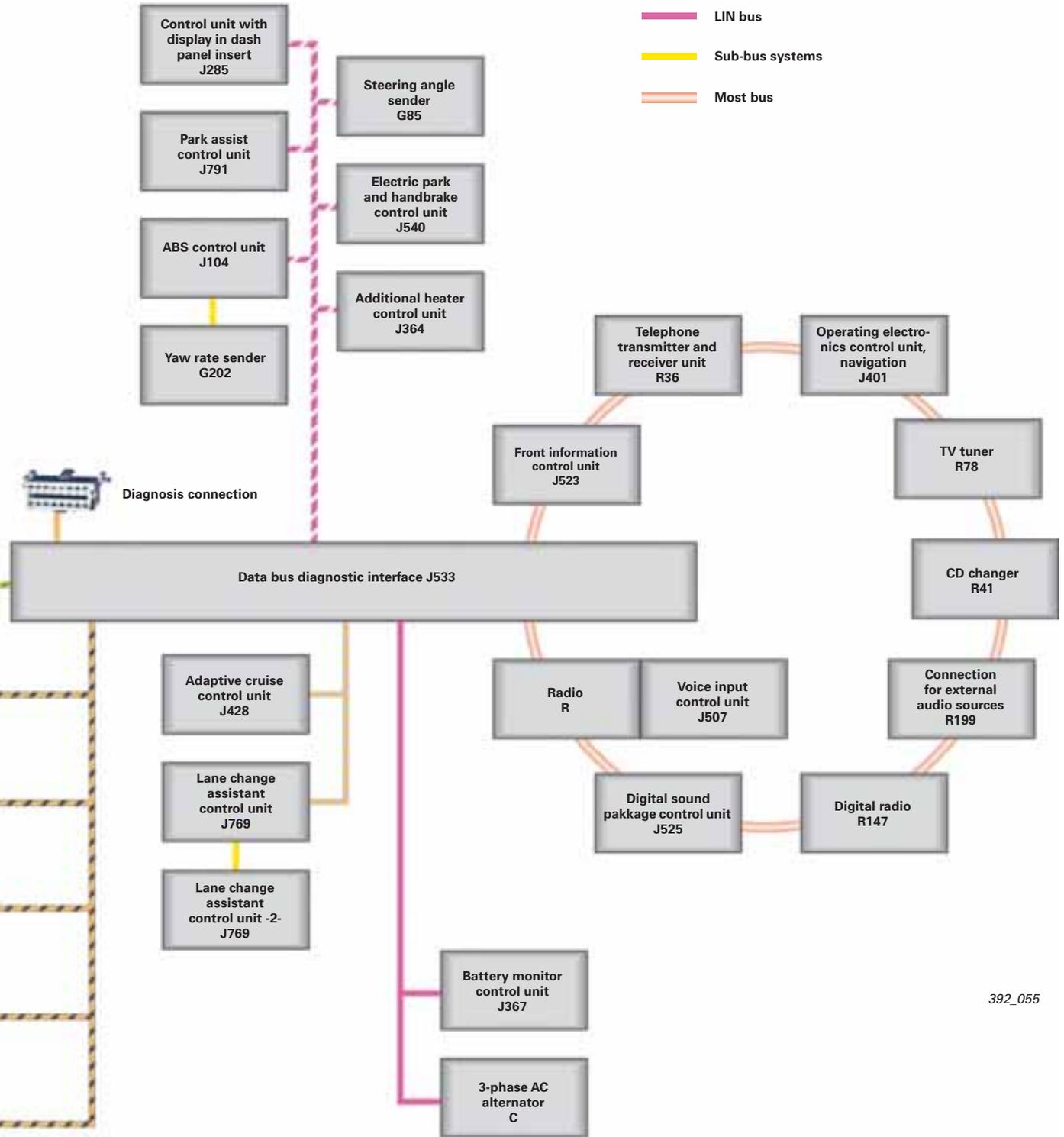
# Electrical System

## Networking – vehicles with MOST bus





- Powertrain CAN bus
- Convenience CAN bus
- Dash panel insert/suspension CAN bus
- CAN extended
- Diagnostics CAN bus
- LIN bus
- Sub-bus systems
- Most bus



392\_055

# Infotainment

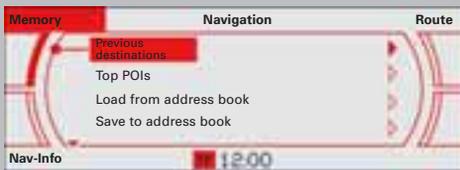
## Infotainment overview

Both radios and MMI systems available on the Audi A5.

If a navigation system is fitted in the vehicle, then the MMI version from the Audi A6 is used. The versions MMI with colour screen and DVD navigation system as well as MMI basic plus with CD navigation are available. The standard and optional equipment are identical to that of the Audi A6.

Standard chorus radio	Optional radios	
	concert radio	symphony radio
		
		
<b>Standard equipment</b>		
Control panel in radio		
Car menu	CAR menu incl. driver assist	
Phase diversity		
TP memory function		
SD/MMC memory card reader		
Single-CD drive in radio	Single-CD drive (MP3/WMA) in radio	CD changer (MP3/WMA) in radio
Amplifier in radio with 2 x 20 watt output for 4 front loudspeakers	Amplifier in radio with 4 x 20 watt output for 8 front and rear loudspeakers	
<b>Options</b>		
VDA interface for aftersales mobile phone retrofitting (exclusively available to key accounts in Germany)		
Mobile phone adaptor on the infotainment CAN bus		
Digital radio tuner (DAB, integrated in radio)		
Digital satellite radio (North America only)		
Audi sound system		
10 loudspeakers in combination with a six-channel amplifier on the infotainment CAN bus		
Bang & Olufsen sound system		
14 loudspeakers in combination with a 10-channel amplifier on the infotainment CAN bus		

All components of the MMI systems are interconnected via the visual MOST data bus. If no navigation system is fitted in the vehicle, then the vehicle is equipped with a radio with external display in the dash panel. The chorus radius is standard equipment on the Audi A5, which means that Audi A5 is without a radio. The functions of the radios are described from page 58 onwards. The radios communicate with the other Infotainment components via the infotainment CAN data bus.



MMI control panel in the centre console

CAR menu incl. driver assist

Diversity radio antenna

TP memory function

Dual tuner

CD changer (MP3/WMA) in dash panel

CD changer (MP3/WMA) in dash panel

4 x 20 watt amplifier on MOST data bus  
8 loudspeakers, front and rear

Driver information system, monochrome

Driver information system, colour

VDA interface for aftersales mobile phone retrofitting (exclusively available to key accounts in Germany)

Mobile phone adaptor on MOST data bus

Bluetooth car phone

Digital radio tuner (DAB)

Digital satellite radio  
(North America only)

Audi sound system

10 loudspeakers in combination with a six-channel amplifier on the MOST data bus

Bang & Olufsen sound system

14 loudspeakers in combination with a 10-channel amplifier on the MOST data bus

Audi music interface

Speech dialogue system

TV tuner

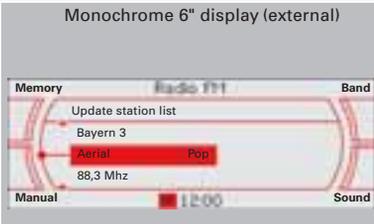
## chorus, concert and symphony radios with MMI operating logic

### Operation

The radios feature control buttons and a central rotary/push-button control adopted from the MMI system and an external display. The well-known and highly praised operating logic was adopted from the MMI system.

Furthermore, the radios can be operated via an optional multifunction steering wheel and the driver information system in the dash panel insert.

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chorus	concert	symphony
Monochrome 6" display (external)	6.5" colour display (external)	6.5" colour display (external)
		
		
Control panel on CD radio		
MMI operating logic		
2-DIN housing		
can be operated via optional multifunction steering wheel		
Display in the driver information system		
6 languages (de, en, es, it, fr, pt)		
<b>Radio</b>		
2 tuner FM/MW/LW		
dynamically updated station list		
FM tuner with phase diversity		
RDS (Radio Data System) with EON (Enhanced Other Network) and RT (FM radio text)		
TP memory function		
<b>Digital radio (optional DAB tuner – integrated)</b>		
Single tuner for band III and L band		
Tuner supports DAB radio text		
<b>CD/SD</b>		
Integrated single-CD drive, CD text capable	Integrated single-CD drive for audio CDs and MP3 and WMA CDs, CD text capable	integrated 6-disc CD changer for audio CDs and MP3 and WMA CDs, CD text capable
Integrated SD/MMC card reader		
Audio data readable in MP3 and WMA formats		
Playlists readable in M3U and PLS formats		
<b>Telephone</b>		
Mute function for hands-free telephone via CAN or Mute pin		
Loudspeaker control unit for hands-free telephone		

<b>chorus</b>	<b>concert</b>	<b>symphony</b>
---------------	----------------	-----------------



**Telephone (with optional Audi mobile phone adaptor)**

	Reception level and roaming symbol display
	"Accept Call", "Refuse Call" and "Hang Up" functions
	Telephone number entry via speller
	Dialling of a telephone number stored in the phonebook of the mobile phone
	Bluetooth symbol appears on the status bar if the mobile phone is connected via Bluetooth to the mobile phone adaptor.
	Telephone setup support

**Air conditioning**

	Indication of settings on the radio display panel when making adjustments with the air conditioning control unit
--	--

**Car**

Car menu	CAR menu incl. driver assist
----------	------------------------------

**Service**

	Diagnostics via CAN
	Transport mode (reduced power demand)
	Anti-theft device via component protection function
	Integrated 4 x 20 watt power module with speed-sensitive volume control (GALA)
	Default sound setting according to body type code (in combination with integrated amplifier)

**Options**

	Telephone VDA interface (exclusive to key accounts in Germany)
	Universal mobile telephone adaptor
	External sound amplifier connectivity for Audi sound system
	External sound amplifier connectivity for Bang & Olufsen sound system

**Versions**

	Standard without DAB tuner
	Standard with DAB tuner
	North America without digital satellite radio
	North America with digital satellite radio
	Japan

## Dual tuner with phase diversity

A dual FM tuner with phase diversity is used in all radios.

Radios with phase diversity are used the first time on the Audi TT '07. They are notable for their good reception and high noise immunity.

The radio module was extended for the Audi A5 in such a way that the FM station list in all radios is updated dynamically while driving.

As with vehicles with MMI, the currently receivable stations are displayed.



392\_081



## Updating the station list

As soon as the radio detects a station with sufficiently good reception, only one tuner is used for reception of the audio and data signals from the set station. The second tuner searches in the background for receivable FM stations and thereby updates the station list. If the signal from the set station is not strong enough for clear reception, both tuners are used for the reception mode "Phase diversity".

The station list cannot be updated while phase diversity is active. The system switches between search mode and phase diversity mode after evaluating various parameters, e.g. field strength, signal quality, data bit error of the RDS signal. Manual switchover is not possible.

## RDS radio text

All radios are capable of reading out the RDS service RT (radio text). Even if an FM station is tuned, it is possible to display on the radio additional data information, e.g. track name and artist of song currently playing, provided the set FM station broadcasts RDS information of this kind.

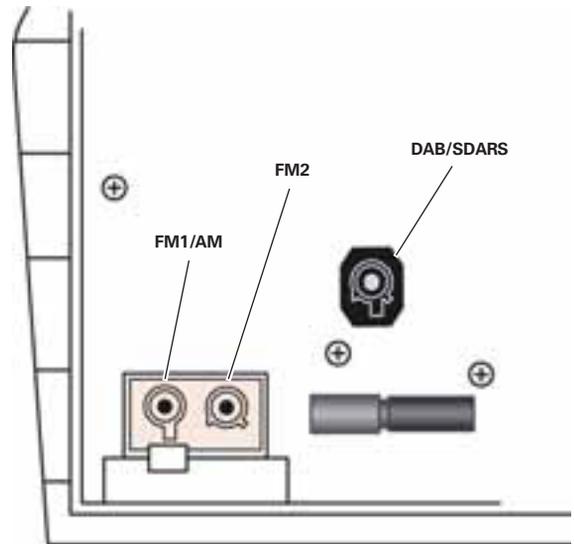


392\_083

## Digital radio

The concert and symphony radios are optionally available with a DAB tuner. The DAB tuner is designed as a single tuner and is integrated in the radio housing. The controls are identical to those of the DAB tuner on the MMI.

A digital satellite tuner is available for the North American market in lieu of the DAB tuner. The digital satellite tuner is also integrated into the symphony radio and receives signals from the service provider Sirius.



392\_077

## MP3 capable CD drive and integrated SD/MMC card reader

The concert and symphony radios have MP3 and WMA capable CD drives. These drives can be used to play back both audio CDs and MP3 and WMA files from data CDs.

A card reader for SD/MMC memory cards is integrated in the concert and symphony radios. The radios assist memory cards up to 4 GB.

The radios can play audio data in MP3 and WMA formats with fixed and variable bit rates. They are capable of reading playlists in M3U and PLS formats. For detailed information on the supported formats, please refer to the current radio operating manual.



Screw fastening

392\_088

## Housing mechanism and installation in the vehicle

The radio housing is the same size as a 2-DIN radio. However the front panel is slightly larger than that of a 1-DIN radio. The lower half of the radio housing is covered by the air conditioning control unit when installed. The radios are attached to the dash panel by four screws. Before removing the radio, the air outlets above the radio as well as the air conditioning control unit must be removed.

The fastening screws can then be undone and the radio removed.

This solution simplifies precision fitting and improves the anti-theft protection of the radio. In addition, the radio screw fastening offers advantages in the event of a rear collision.

## Telephone operation

The concert and symphony radios can be used to operate - as previously with the Navigation plus (RNS-E) system - the standard mobile phone adaptor. Information is exchanged between the radio R and the telephone transmitter and receiver unit R36 via the infotainment CAN bus. This system has the same functions as the Navigation plus (RNS-E) system. The telephone transmitter and receiver unit R36 has the same functions as the previous control unit for vehicles with infotainment CAN bus. Hands-free sets by mobile phone manufacturers cannot be operated with the radios.



392\_084

## Car

The new radios can be used to make custom settings in many convenience and drive control units. The radio serves only as a display and operating unit. It evaluates messages on the Infotainment CAN bus and displays them.

The desired setting can be made with the rotary/push-button control on the radio. The setting information is then sent from the radio back via the infotainment CAN bus and the central gateway to the relevant control unit. The selected CAR settings are stored only in the relevant control unit and not in the radio.



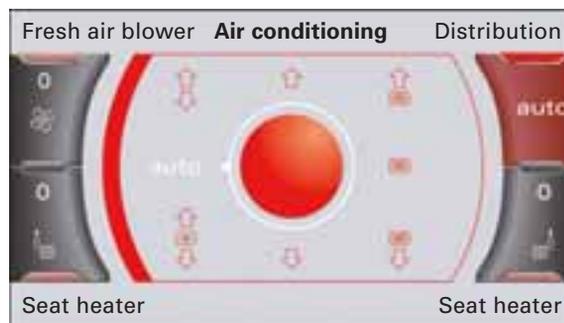
392\_082

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## Air conditioning display

The radio display serves also to display the air conditioning settings. If a single-zone air conditioning system is installed on the vehicle, the selected interior temperature is indicated in the display footer.

If the air conditioning settings are changed, the air conditioning system displays known from the MMI are shown on the radio display panel. As with the MMI, all air-conditioning adjustments can be made on the air conditioning control unit.



392\_146

## Service and communication with the vehicle

Data and diagnostic information are exchanged via the infotainment CAN bus.

This includes:

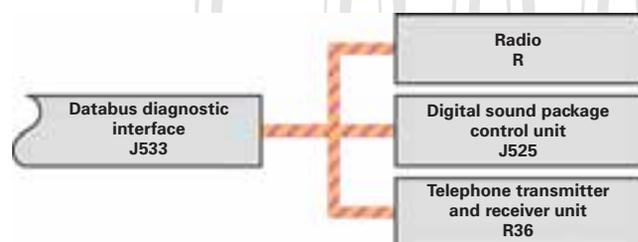
- terminal control system (terminal 15, NO contact)
- display dimming, vehicle speed signal, engine speed
- control unit communication for CAR settings
- communication with telephone transmitter and receiver unit R36
- communication with the dash panel insert (driver information system) and multifunction steering wheel
- Anti-theft protection: The radios no longer have a 4-digit PIN code and have to be activated online like the Infotainment control units of the MMI systems.
- Communication with the digital sound package control unit J525:
  - Amplifier OFF/ON
  - Noise compensation and surround mode

CAN networking of the chorus radio



392\_093

CAN networking of the concert and symphony radios



392\_078

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## Audio signal output

A 4 x 20 W power module is installed as standard in the radios. If no external amplifier is fitted in the vehicle, the loudspeakers are connected directly to the radio audio signal outputs.

If an external audio amplifier is installed on the vehicle, the output level in the radio is code-switched, which means an external audio amplifier can be connected to the plug-in contacts for the loudspeakers after recoding.

Function diagrams of the radios can be found under "Sound systems" on pages 67 to 71.

## Sound systems

### Overview

	Basic sound system	Audi sound system	Bang & Olufsen sound system
<b>chorus radio</b>	<p>Amplifier integrated in radio R</p> <p>2 x 20 watt output for 4 front loudspeakers</p> <p>depending on country, 4 x 20 watt is also available for 4 x 2 loudspeakers, front and rear</p>	-	-
<b>concert and symphony radios</b>	<p>4 x 20 watt amplifier integrated in radio</p> <p>is also available for 4 x 2 loudspeakers, front and rear</p>	<p>180 watt six-channel amplifier in the boot at the rear left</p> <p>4 x 2 loudspeakers, front and rear</p> <p>Centre loudspeaker in the dash panel</p> <p>Subwoofer in the rear shelf</p>	<p>505 watt 10-channel amplifier in the boot at the rear left</p> <p>2 x 3 front loudspeakers 2 x 2 rear loudspeakers</p> <p>Centre loudspeaker in the dash panel</p> <p>Subwoofer as well as 2 surround loudspeakers in the rear shelf</p>
		Data transfer via infotainment CAN bus, audio signal transfer cross twisted copper lead	
<b>MMI basic plus Navigation and MMI</b>	<p>4-channel amplifier in the boot on the left</p> <p>4 x 2 loudspeakers, front and rear</p>	<p>180 watt six-channel amplifier in the boot at the rear left</p> <p>4 x 2 loudspeakers, front and rear</p> <p>Centre loudspeaker in the dash panel</p> <p>Subwoofer in the rear shelf</p>	<p>505 watt 10-channel amplifier in the boot at the rear left</p> <p>2 x 3 front loudspeakers 2 x 2 rear loudspeakers</p> <p>Centre loudspeaker in the dash panel</p> <p>Subwoofer as well as 2 surround loudspeakers in the rear shelf</p>
		Data and audio signal transfer via optical MOST bus	



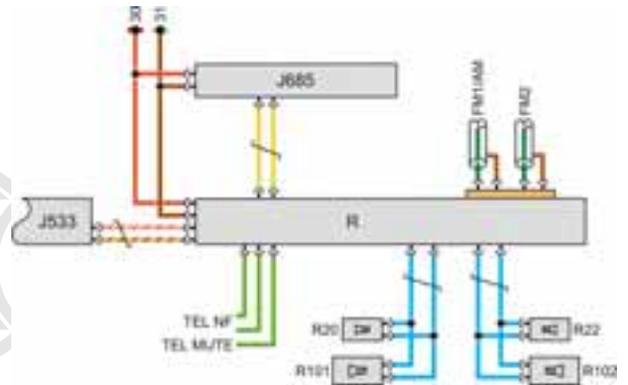
# Audi

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### Basic sound with chorus radio

The Audi A5 is equipped as standard with a two-way loudspeaker system in the doors. The associated amplifier with two 20 watt power modules is integrated in the radio R. In some countries, dual two-way loudspeaker systems are standard for the doors and the rear side trims. The amplifier with four 20 watt power modules is also integrated into the radio R.

The loudspeakers are diagnosed via the radio R, i.e. via address word 56.



392\_057

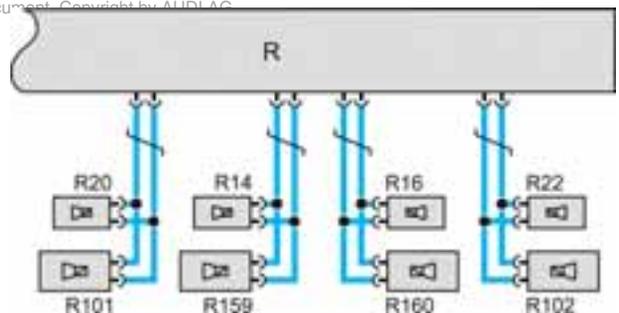


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### Basic sound for the concert and symphony radios

The amplifier with four 20 watt power modules is also integrated into the radio R. The Audi A5 is equipped with dual two-way loudspeaker systems in the doors and in den rear side trims.

The loudspeakers are diagnosed via the radio R, i.e. via address word 56.

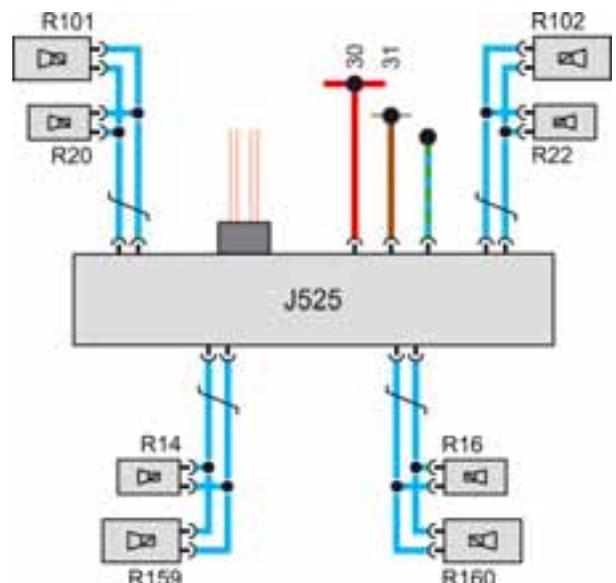


392\_086

### Basic sound with MMI and MMI basic

A separate amplifier is installed in the boot at the rear left. The amplifier communicates with the other infotainment control units via the MOST bus. The amplifier also has 4 x 20 watt output like on vehicles with radio R. The Audi A5 is equipped with dual two-way loudspeaker systems in the doors and in the rear side trims.

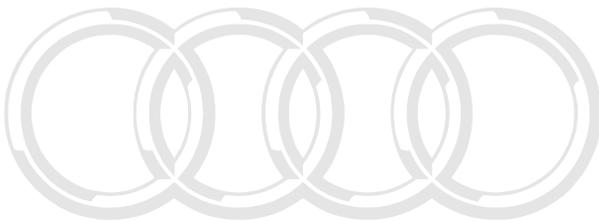
The amplifier is diagnosed via address word 47.



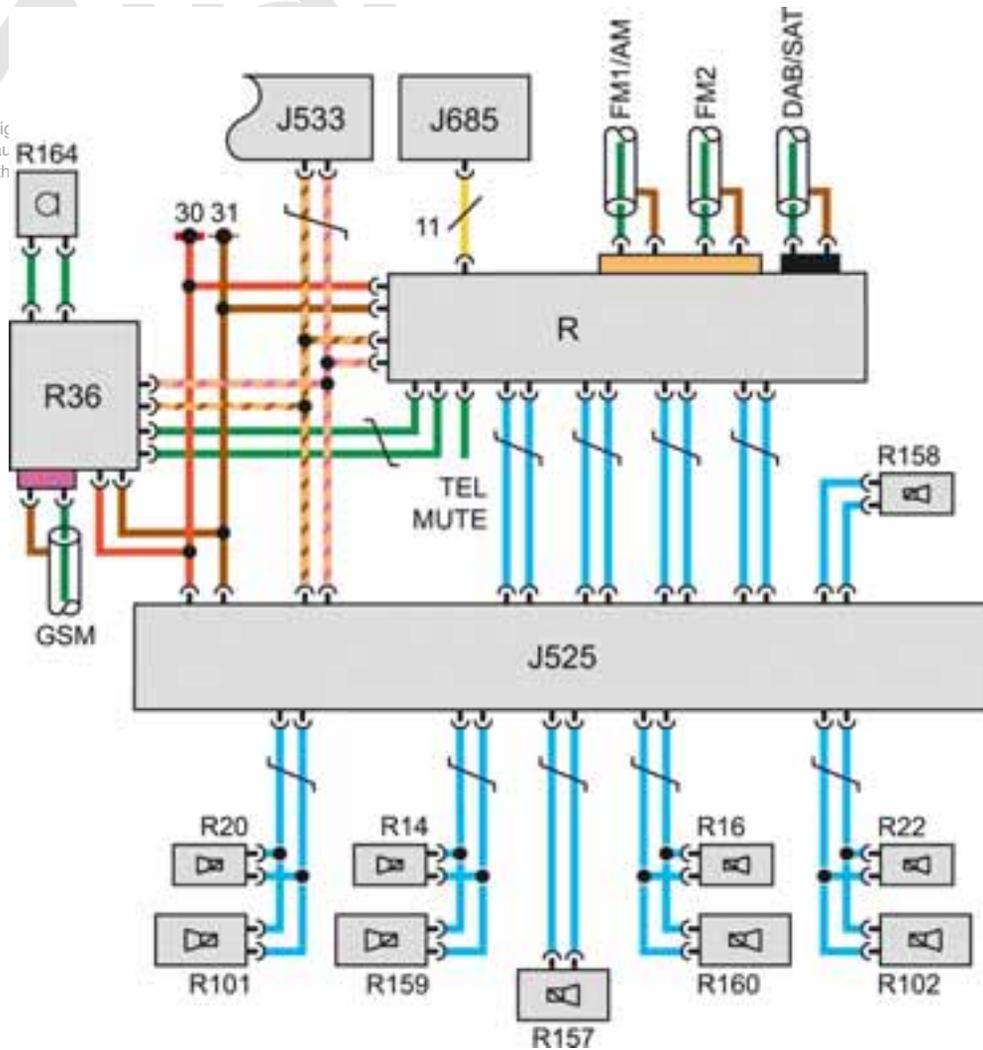
392\_096

## Audi sound system for the concert and symphony radios

A separate six-channel amplifier is installed in the boot at the rear left. The amplifier communicates with the other Infotainment control units via the infotainment CAN bus. The 180-watt amplifier drives a total of 10 loudspeakers. In addition to the 8 loudspeakers of the basic sound system, a subwoofer is installed in the rear shelf and a centre loudspeaker in the dash panel, each of which is supplied by a separate amplifier channel. The amplifier is diagnosed via address word 47.



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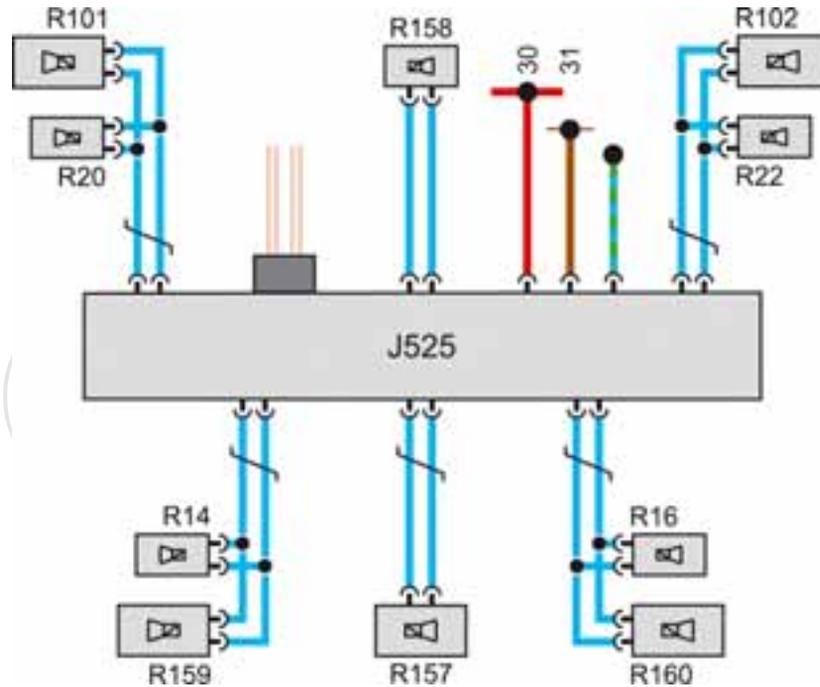
## Audi sound system for MMI and MMI basic

A separate six-channel amplifier is installed in the boot at the rear left.

The amplifier communicates with the other infotainment control units via the MOST bus.

The 180-watt amplifier supplies a total of 10 loudspeakers. In addition to the 8 loudspeakers of the basic sound system, a subwoofer is installed in the rear shelf and a centre loudspeaker in the dash panel, each of which is supplied by a separate amplifier channel.

The amplifier is diagnosed via address word 47.



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392\_059

### Legend for all function diagrams

J533	Data bus diagnostic interface
J525	Digital sound package control unit
R	Radio
R14	Rear left treble loudspeaker
R16	Rear right treble loudspeaker
R20	Front left treble loudspeaker
R21	Bass loudspeaker, front left
R22	Front right left treble loudspeaker
R23	Bass loudspeaker, front right
R36	Telephone transmitter and receiver unit
R74	Internal microphone
R103	Front left mid-range loudspeaker
R104	Front right mid-range loudspeaker
R105	Rear left mid-range loudspeaker
R106	Rear right mid-range loudspeaker
R157	Subwoofer in rear shelf
R158	Mid-range/treble loudspeaker, centre
R159	Mid-range/treble loudspeaker, rear left
R160	Mid-range/treble loudspeaker, rear right
R164	Microphone unit in front overhead module

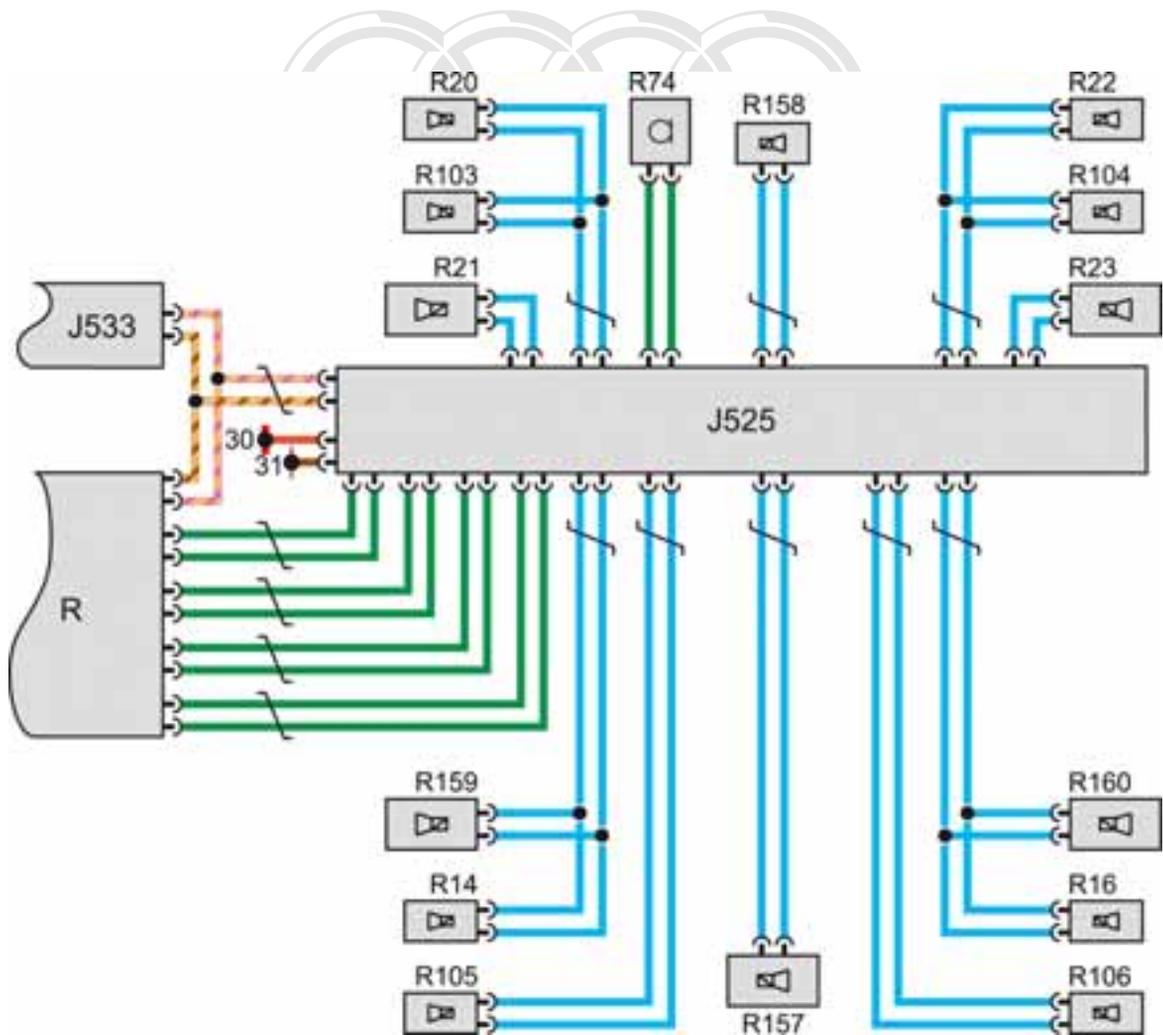
	Infotainment CAN bus
	CAN display
	Input signal
	Output signal
	Terminal 30
	Terminal 31
	Sub-bus system
	MOST bus
	bidirectional

## Bang & Olufsen sound system for concert and symphony radios

A separate six-channel amplifier is installed in the boot at the rear left. The amplifier communicates with the other Infotainment control units via the infotainment CAN bus. The 505-watt amplifier in the Bang & Olufsen sound system supplies

- a three-way front loudspeaker system (6 loudspeakers through 4 channels),
- a two-way rear loudspeaker system (4 loudspeakers through 2 channels),
- a centre loudspeaker in the dash panel,
- a subwoofer in the rear shelf as well as
- two surround loudspeakers in the rear shelf.

The surround effect can be deactivated in the sound setup menu of the radio. An ambient noise measuring microphone is connected to the amplifier allowing the amplifier to optimally adapt the output volume to the driving noise level. Alternatively, the operator can set the GALA level in 7 steps or deactivate it completely in the radios. The amplifier is diagnosed via address word 47.



## Bang & Olufsen sound system for MMI and MMI basic

A separate six-channel amplifier is installed in the boot at the rear left. The amplifier communicates with the other infotainment control units via the MOST bus. The 505-watt amplifier in the Bang & Olufsen sound system supplies

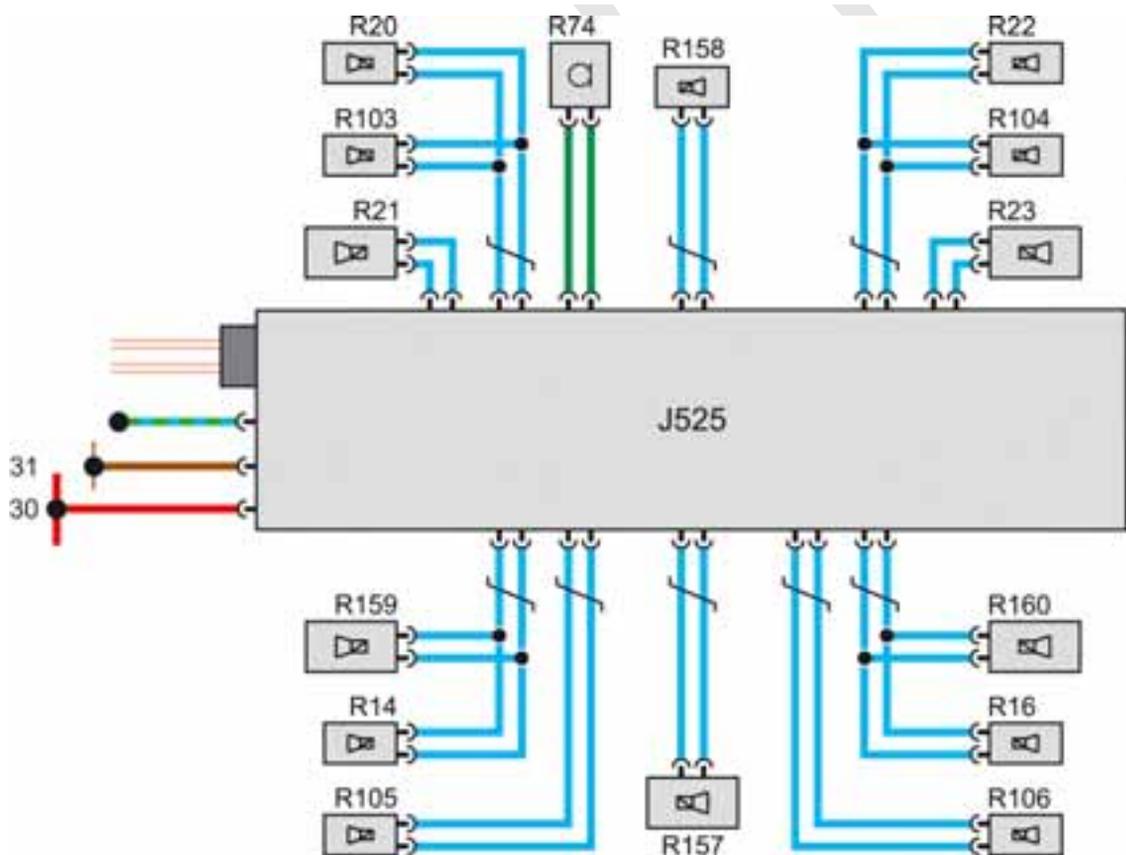
- a three-way front loudspeaker system (6 loudspeakers through 4 channels),
- a two-way rear loudspeaker system (4 loudspeakers through 2 channels),
- a centre loudspeaker in the dash panel,
- a subwoofer in the rear shelf as well as
- two surround loudspeakers in the rear shelf.

The surround effect can be set in the sound setup menu of the MMI and MMI basic.

An ambient noise measuring microphone is connected to the amplifier allowing the amplifier to optimally adapt the output volume to the driving noise level. If this is not desired by the user, the function can be deactivated in the sound setup menu under GALA.

If a vehicle with MMI is equipped with a speech dialogue system, a second microphone is connected to the amplifier.

The amplifier is diagnosed via address word 47.



392\_061

## Service

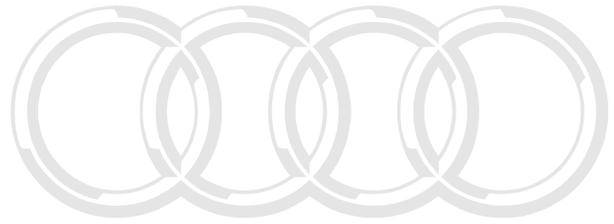
For the first time in an Audi, the various sound curves (equaliser settings) for the various specifications (right/left-hand drive, leather/fabric, petrol/diesel engine) are no longer stored completely in the amplifier. If the amplifier is coded in the workshop using the diagnostic tester, the diagnostic tester downloads the relevant sound curve onto the amplifier from a central data server. This has the advantage that the latest sound curve for the vehicle can always be installed on the amplifier.

## Aerials

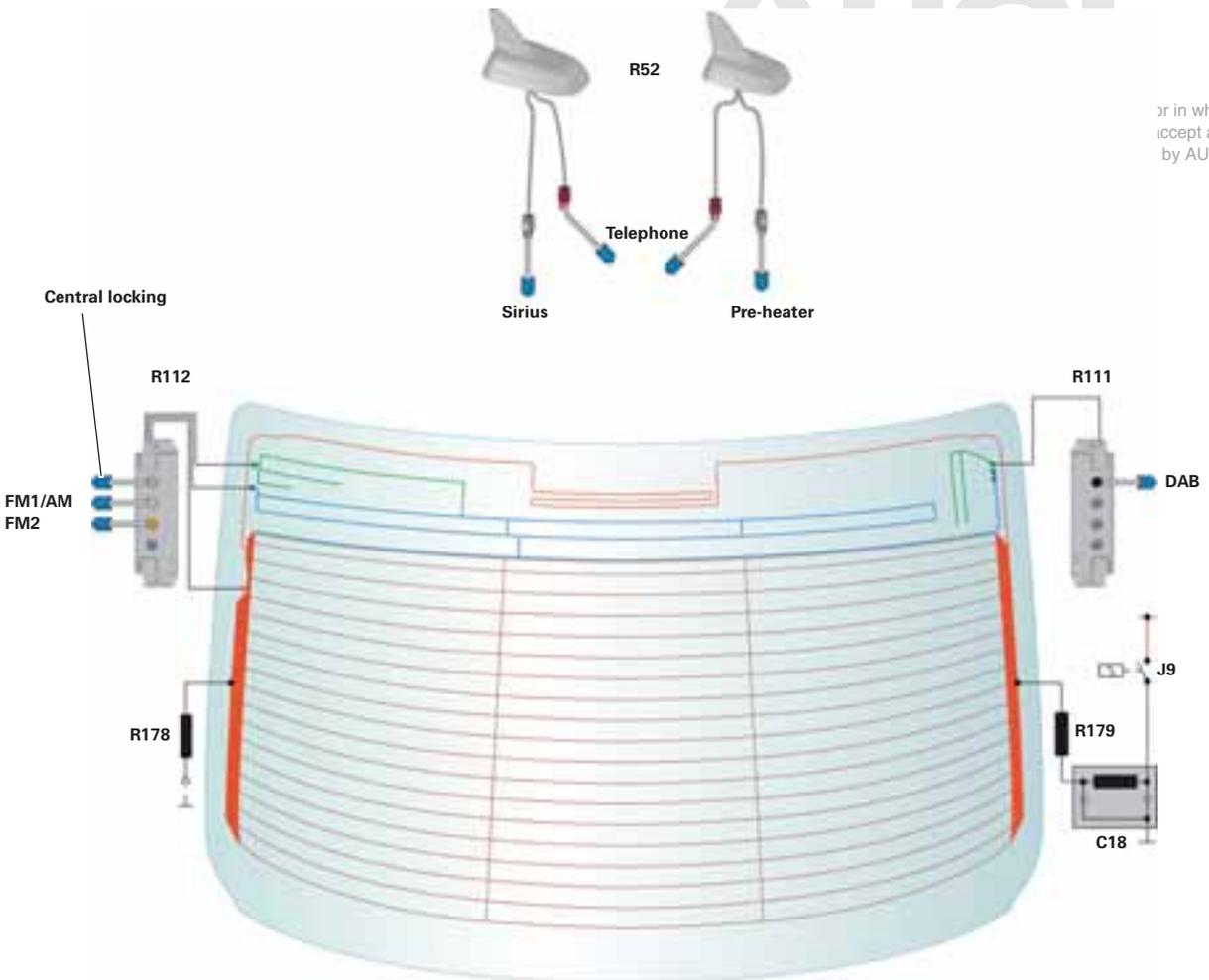
Most of the aerials on the Audi A5 are integrated in the rear window. Only the navigation, telephone, pre-heater and digital satellite radio (North America only) aerials are integrated in the roof aerial. The amplifiers for the various systems are integrated at the left and right C-posts.

The connections to the aerial amplifiers are adapted to the existing vehicle specification. The aerial amplifiers only have as many connections as are required by the infotainment components (radio, telephone, navigation, TV, etc.).

Due to the different radio tuner principles, various FM aerial systems are installed on the vehicle. Radios with phase diversity for FM reception (chorus, concert or symphony) have a different FM aerial system than radios with switched diversity (MMI basic with navigation or MMI with DVD navigation system).



Aerial system with phase diversity



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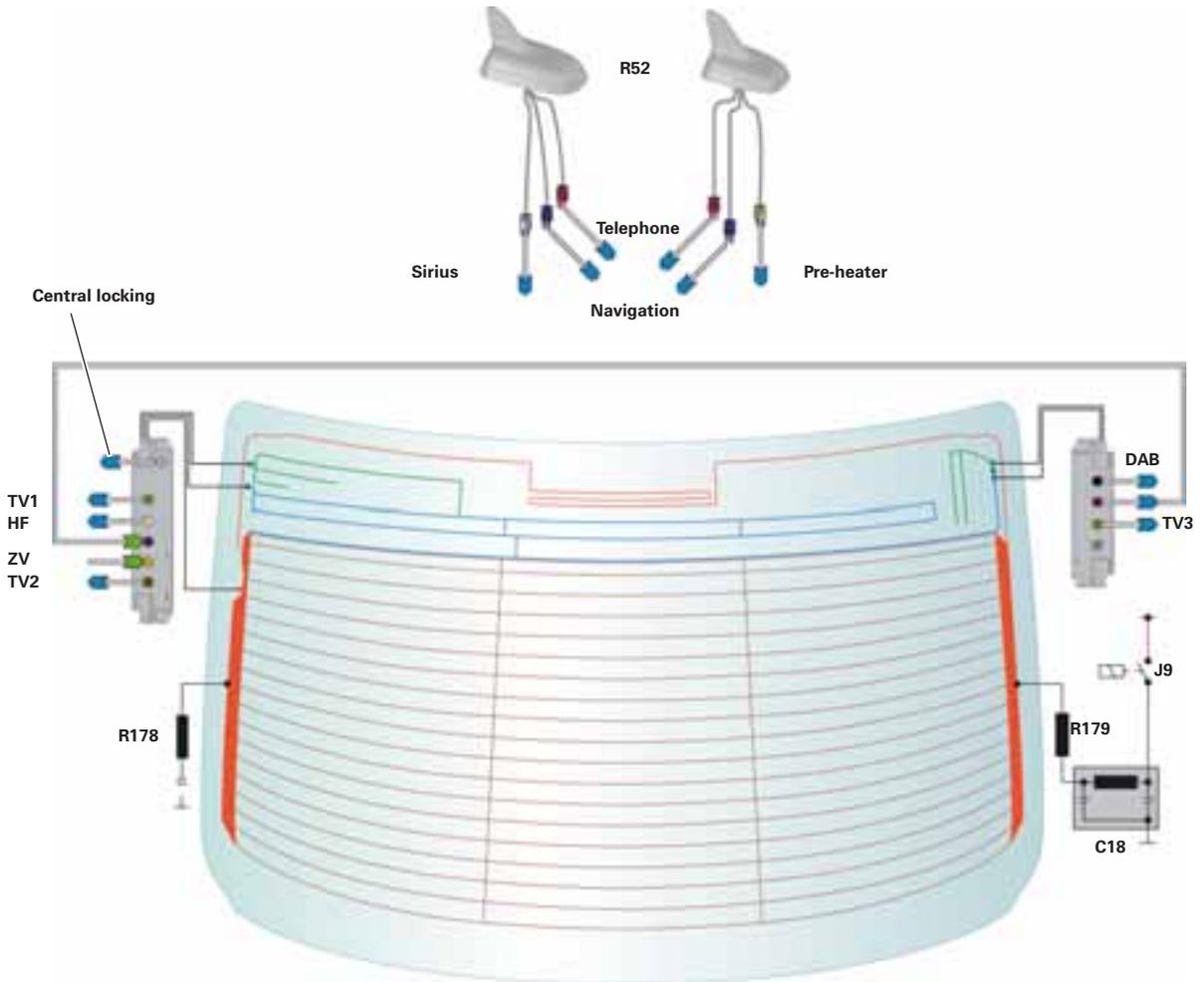


**Legend**

- C18 Windscreen aerial suppression filter
- J 9 Heated rear window relay
- R52 Radio/telephone/navigation aerial (GPS)
- R111 Aerial amplifier -2-
- R112 Aerial amplifier -3-
- R178 Frequency filter for frequency modulation (FM) in the negative lead
- R179 Frequency filter for frequency modulation (FM) in the positive lead

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**Aerial system with switched diversity**



392\_095

# Air conditioning

## Overview

The new Audi A5 is equipped as standard with an automatic deluxe automatic air conditioning system. The deluxe automatic air conditioning is a combination of a heating/ventilation system and a cooling system for dehumidifying and cooling the vehicle interior.

The customer can choose from two different automatic air conditioning systems:

- single-zone deluxe automatic air conditioning system
- triple-zone deluxe automatic air conditioning system plus

Both systems are automatic air conditioning systems. They differ at first glance with respect to the air conditioning control unit. The single-zone automatic air conditioning system is the standard version.

The air conditioning control unit of the single-zone deluxe automatic air conditioning system does not have its own display.

The selected settings are displayed via the MMI screen only.

Nevertheless, the status line is continuously displayed on the MMI screen so the driver always has the selected settings in view.

In the air conditioning control unit of the single-zone deluxe automatic air conditioning system, no distinction is made between degrees Celsius and degrees Fahrenheit.

The temperature adjustment directions are indicated by the illumination of the rotary control; the ring is illuminated blue in the direction of lower temperature values and red in the direction of higher temperature values.

Deluxe automatic air conditioning system



392\_039

The air conditioning control unit of the triple-zone deluxe automatic air conditioning system plus has, as is usual, two rotary controls for separate temperature control on the driver and front passenger sides.

The temperature can be displayed in degrees Celsius or degrees Fahrenheit via the integrated display.

Deluxe automatic air conditioning Plus



Triple-zone deluxe automatic air conditioning plus provides further convenience functions:

- Indirect ventilation
- Rear ventilation
- Separate air distribution driver and front passenger side
- Air quality sensor
- Air humidity sensor
- Third climate zone for the rear passengers

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392\_073

## Refrigerant system

Both versions of the automatic air conditioning system have a backpressure regulator and solar radiation sensors for incident solar radiation measurement.

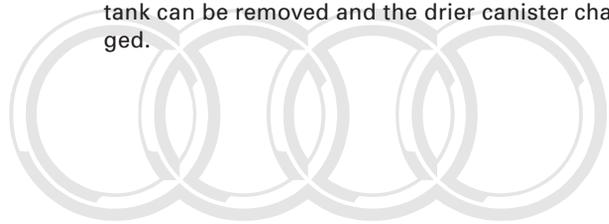
The single-zone deluxe automatic air conditioning has a plain dust and pollen filter and a manual air recycle function.

The triple-zone system has a combined filter (dust and pollen filter with activated charcoal) and an automatic air recycle function.

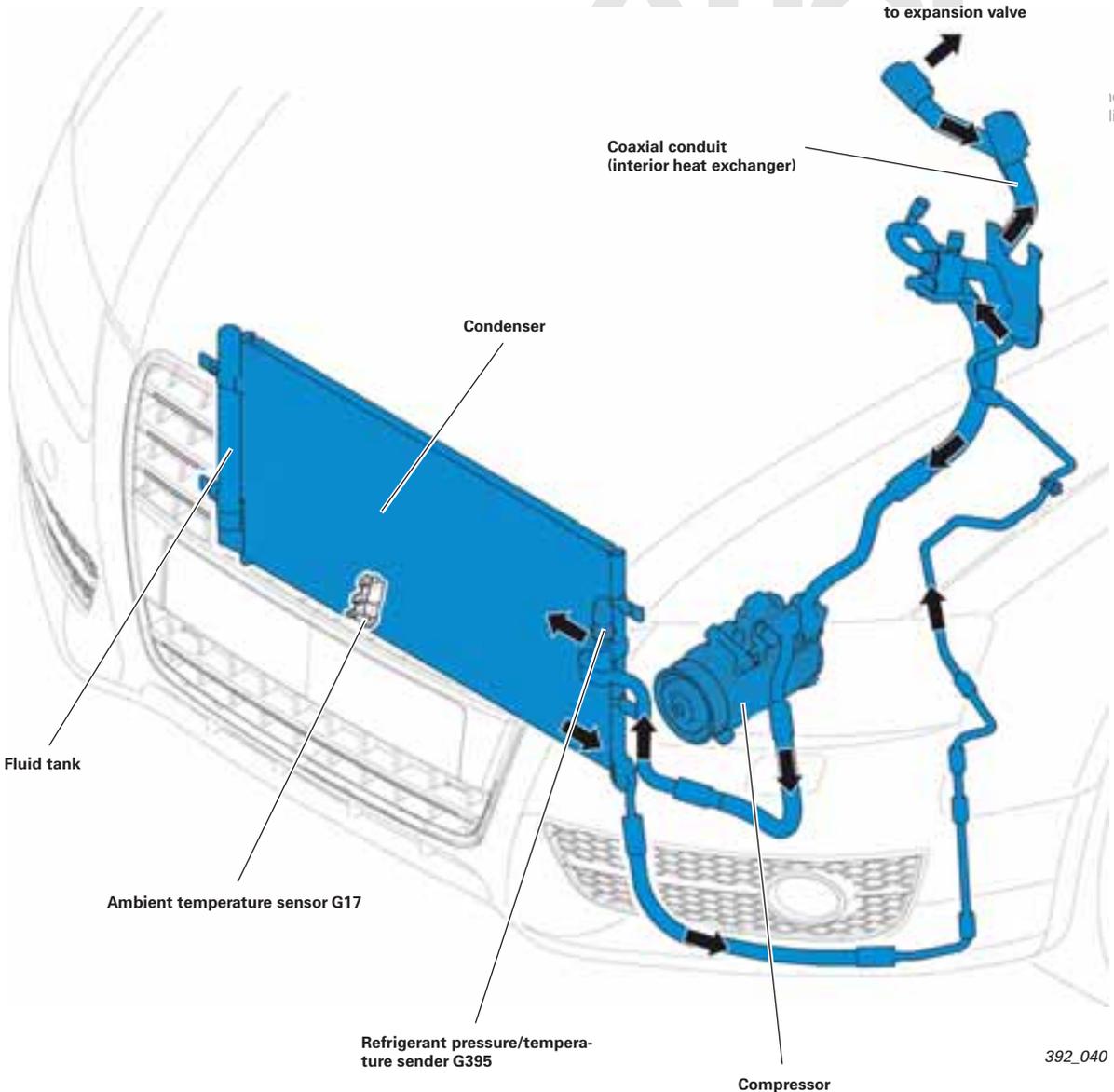
Both systems have identical refrigerant systems. They are driven by a six-piston wobble plate compressor, which are driven via a poly-vee belt in six-cylinder engines.

A seven-piston compressor is used in eight-cylinder engines. This compressor is powered by a standard shaft drive.

The fluid tank with drier is mounted directly on the condenser. After removal of the bumper, the fluid tank can be removed and the drier canister changed.



### Refrigerant system in overview



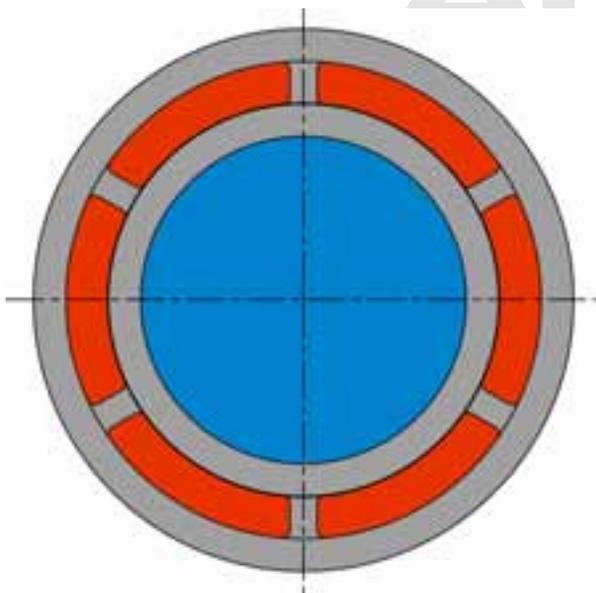
# Air conditioning

## Coaxial refrigerant conduit

For the first time, a coaxial conduit is used as a refrigerant line on the Audi A5. The two air conditioning lines (high-pressure line from condenser and low-pressure line back to compressor) are coupled by means of new quick-release couplings at the start of the coaxial conduit. The expansion valve is located at the other end of the coaxial conduit. The coaxial conduit is a refrigerant conduit in which high-pressure and low-pressure lines are encased in separate sheaths.

The refrigerant flows along the outer line to the expansion valve and along the inner line from the expansion valve back to the air conditioning compressor. Arranged in this way, the two refrigerant conduits form an internal heat exchanger. The result is higher system efficiency and better fuel economy.

Cutaway view of the coaxial conduit

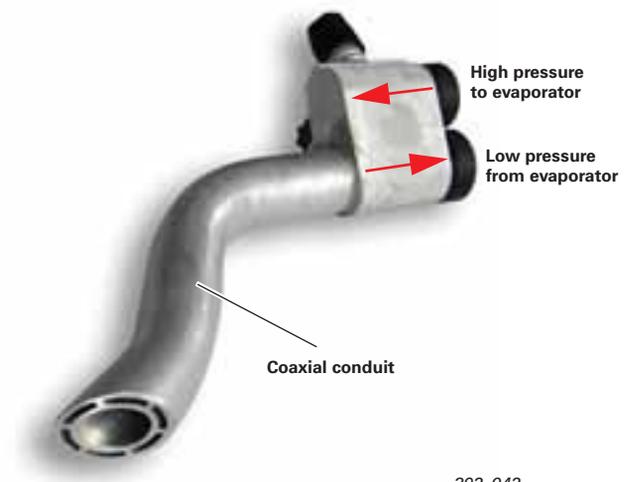


-  High pressure
-  Low pressure
-  Refrigerant pipe



392\_041

Coaxial conduit with quick release couplings



392\_042

New quick-release couplings are fitted at the joint between the coaxial conduit and the two refrigerant conduits.

For assembly of the conduit system, the two air conditioning lines must be lightly lubricated with refrigerant oil and connected to the quick-release couplings on the coaxial conduit until fully seated or until they visibly or audibly click into place.

To check the connection, pull the refrigerant conduit against the direction of assembly; the indicator pins must be visible or tactile.

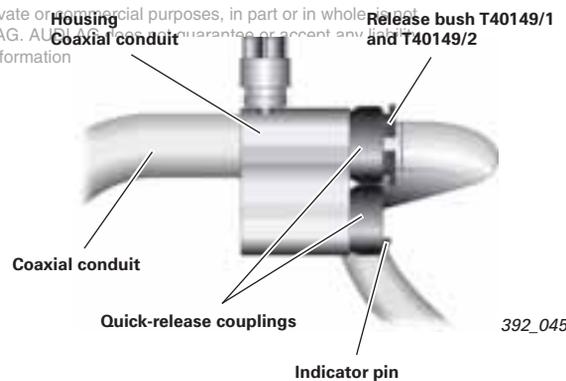
Use release bushes T40149/1 and T40149/2 to disconnect lines.

Clip the release bush onto the refrigerant conduit, then push the line inwards and the release bush inwards until the lines noticeably disconnect. The line can now be withdrawn from the coaxial conduit housing together with the release bush. The lines must not be counter-rotated during dismantling.



392\_044

Quick-release couplings

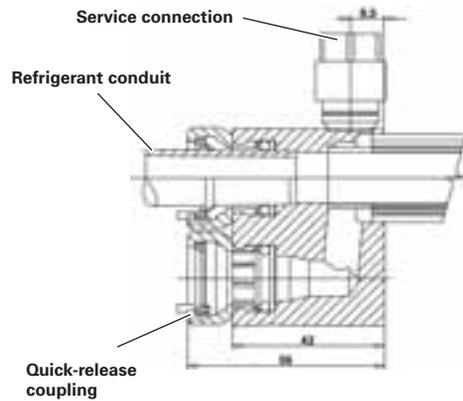


392\_045



**Note**

After removing the lines, the quick-release couplings must be checked and all seals, O-rings and support rings replaced.



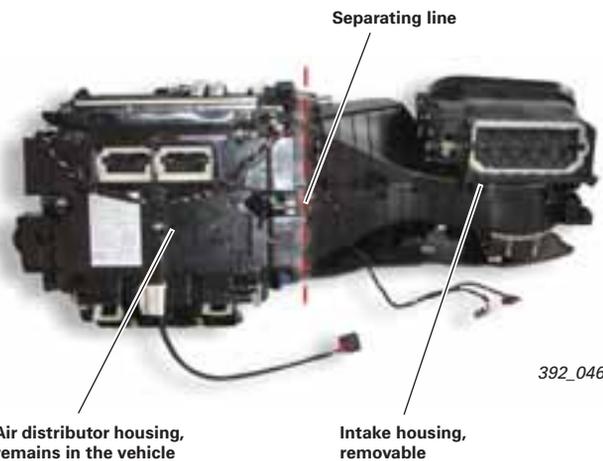
392\_147

**Air conditioner Audi A5**

The air conditioner of the Audi A5 comprises two parts which can be separated from one another with the dash panel installed. The air distributor housing remains installed in the vehicle, and the intake housing can be removed.

Removing the intake housing provides access to the following components:

- Heater heat exchanger
- Evaporator
- Supplementary heater element Z35
- Temperature flap control motor, right V159



392\_046

# Air conditioning

## Removing the intake housing



## Service evaporator

The standard evaporator is replaced together with the two evaporator lines with a service evaporator during repair work in the service workshop.

When removing the evaporator, the evaporator lines must be disconnected using special tool T10147; this is the only way in which the evaporator can be removed.

The service evaporator kit comprises the evaporator including a service pipe assembly and mounting hardware.

A complete service heat exchanger kit is also available for the heater heat exchanger.

This kit allows the pipe connections to be attached in the service workshop using a holder, which likewise has a threaded connection (the original fastening can no longer be used in the service workshop; original clips no longer lock reliably in place).

The illustration shows the two pipe assemblies of the evaporator. The standard pipe assembly, shown on the left of the illustration, is replaced by a threaded service pipe assembly when repair work is done (illustration on right).



Standard pipe assembly, using the evaporator as an example



Threaded service pipe assembly of the evaporator

392\_049

### Note



For flushing the refrigerant system, e.g. the new adaptor VAS 6338/36 is also used when repairing a damaged compressor.

# Air conditioning

## Automatic air conditioning system - electrics

Not all sender and sensor signals on the Audi A5 are read directly into the climatronic control unit J255. For example, the values of the refrigerant pressure/temperature sender G395

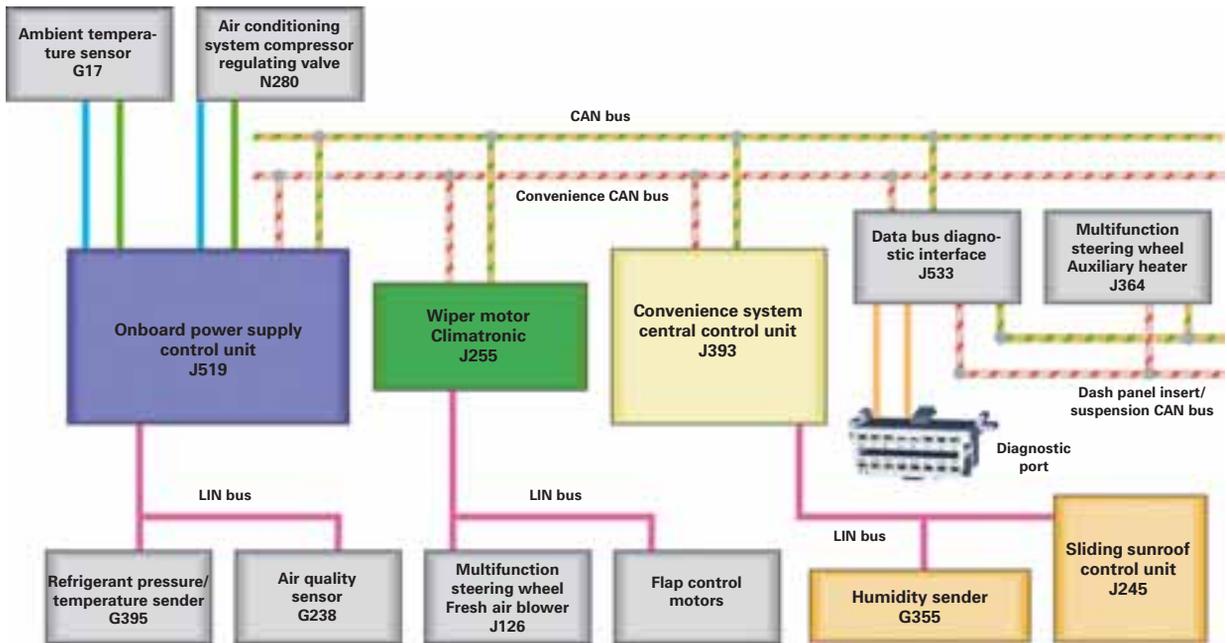
and the humidity and windscreen temperature sender G458 in the onboard power supply control unit or in the convenience system central control unit are processed.

The participating control units provide their data to the climatronic control unit J255 via the CAN network.



# Audi

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392\_050

## Servomotors

The servomotors of the individual flap drives are all identical, and therefore can be installed on any flap. The motors are of the stepper motor type. They do not require potentiometers, unlike the servomotors used previously.

The servomotors are connected in series and controlled via a separate LIN bus.

The single-zone automatic air conditioning system has six flap control servomotors, while the triple-zone automatic air conditioning system also has 10 series-connected servomotors.

To enable the individual servomotors to the assigned to the different flaps, the addresses of the individual flap actuators must be assigned to the servomotors.

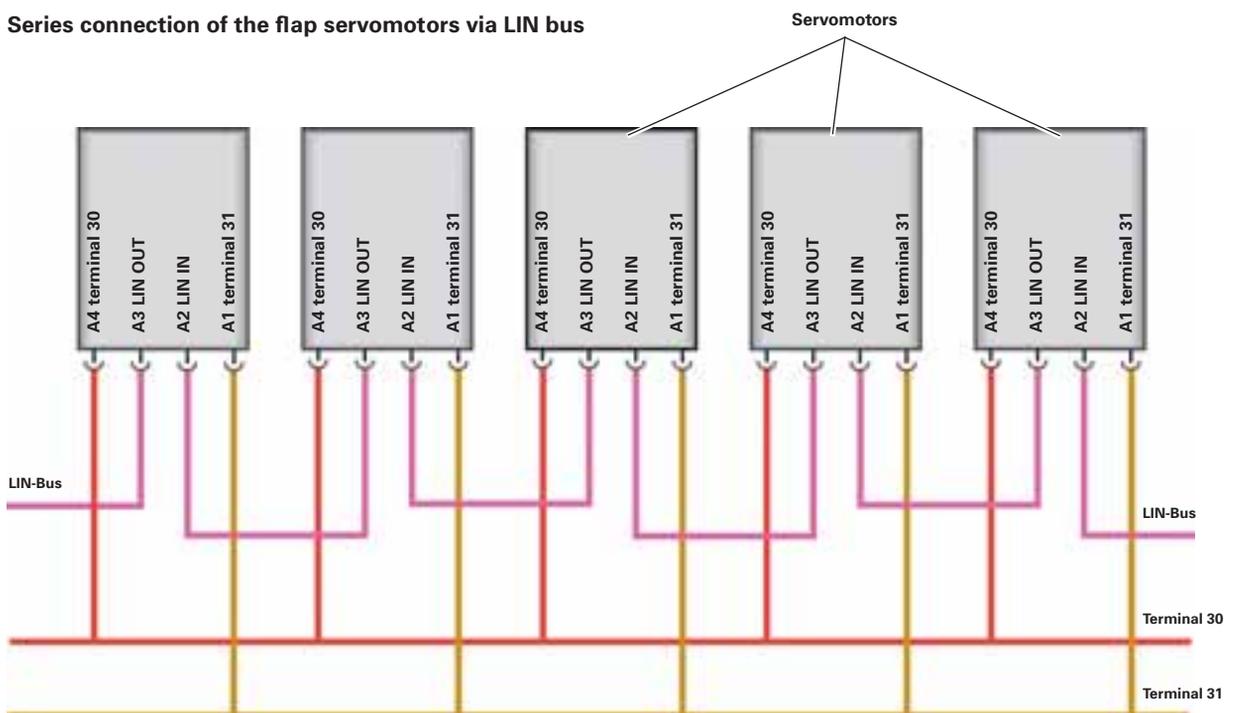
Addressing of the servomotors can be performed on the VAS diagnostic tester in the Guided Fault Finding or Guided Functions program under Basic Setting - Channel 001.

The first step is to reset all the servomotors. The climatronic control unit J255 then sends the auto addressing command.

Addresses are assigned automatically to each of the servomotors. The basic settings cannot be made on channels 001 and 003 until addressing has been completed.

The addressing procedure must be repeated after disconnecting more than one connector or servomotor.

### Series connection of the flap servomotors via LIN bus



392\_051

#### Note



The connectors and servomotors must not be interchanged after addressing has been successfully performed.

## Sensors and actuators

### Ambient temperature sensor G17

Only one ambient temperature sensor is used for evaluating the ambient temperature.

The ambient temperature sensor G17 is located in the front section of the vehicle behind the bumper, directly in front of the condenser.

The onboard power supply control unit J519 provides the value of the ambient temperature sensor via CAN bus to the control unit with display in dash panel insert J285 and the climatronic control unit J255. In the event of a faulty ambient temperature sensor G17, the ECON function is activated; the activated ECON-LED shows that the air conditioner compressor is not running and the automatic air conditioning system is deactivated.

### Air quality sensor G238

The signal from the air quality sensor G238 is required by the climatronic control unit J255 for automatic air recirculation. In case of failure of the sensor, the automatic air recycle function will be unavailable.

### Humidity sender G355

The purpose of the humidity and windscreen temperature sender G458 is to prevent misting of the windscreen. To this end, the sender measures the water content in the air and the temperature directly in front of the windscreen by means of a capacitive thin film sensor.

The humidity and windscreen temperature sender G458 functions in much the same way as a plate condenser, the measured capacitance indicating the degree of humidity.

The sensor electronics convert the measured capacitance to a voltage.

### Refrigerant pressure/temperature sender G395

The refrigerant pressure/temperature sender G395 is used on the Audi A5.

The sender interchanges data by LIN bus signal with the onboard power supply control unit J519.

From here, the data is transferred to the climatronic control unit J255 by CAN bus.

The refrigerant temperature value measured by the refrigerant pressure/temperature sender G395 is currently not evaluated, but can nevertheless be read out in the measured data blocks.

## PTC element for auxiliary heating

At roll-out of the Audi A5, diesel models will be equipped exclusively with an electrical auxiliary heater (PTC element).

Vehicles equipped with an optional pre-heater also have a PTC heater element as an auxiliary heater at start of production. The fuel powered pre-heater is currently not used as an auxiliary heater in these vehicles.

## Pre-heater

The Audi A5 can be ordered optionally with a pre-heater.

The pre-heater is based on the new generation of Eberspächer pre-heaters, the Hydronic II. The combustion chamber with flame tube has been modified. This combustion chamber on the Audi A5 has an additional heater directly above the glow element. It provides faster and more effective fuel evaporation.

Diesel-powered models currently have an electrical PTC element, although a pre-heater is optional.

Pre-heater, optional



392\_052

## Maintenance concept

At roll-out of the Audi A5, an improved maintenance concept with reorganised maintenance work and times will be introduced to meet the various customer driving profiles.

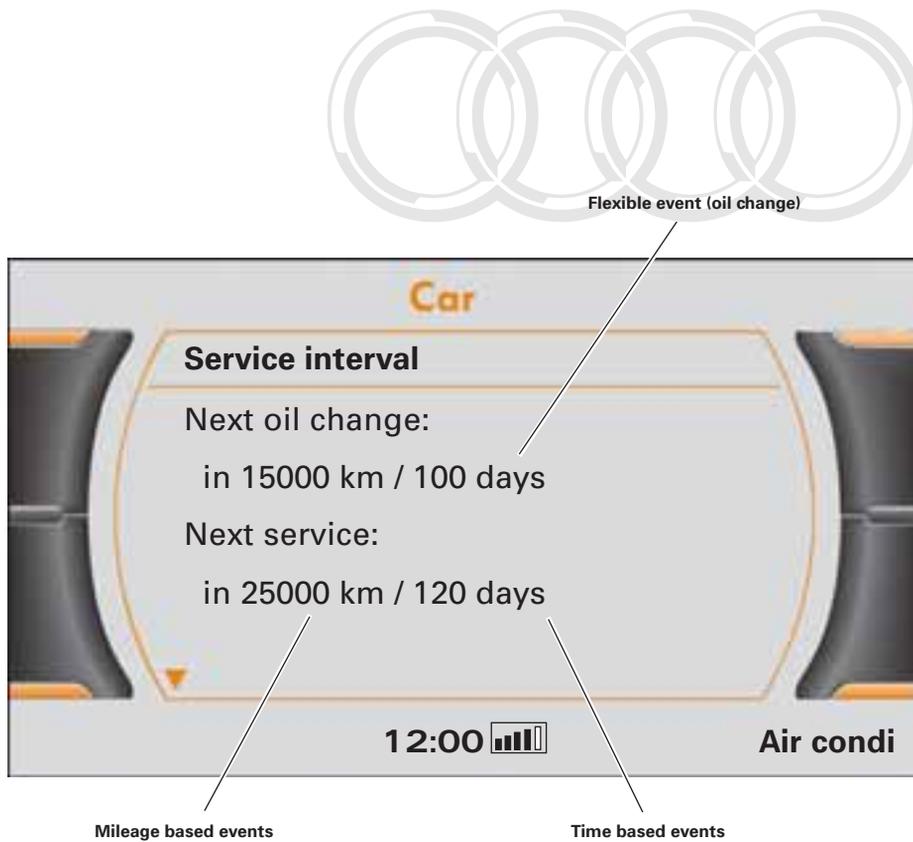
This maintenance concept will also be introduced on the Audi A3 and Audi TT from model year '08 onwards.

A key component of the improved maintenance concept is the distinction between "oil change" and "inspection", instead of coupling the service events to the oil change intervals as previously.

The Service Interval Display now indicates to the customer not only when the oil change is due, this being a flexible event, but also when time and mileage based service events are due.

As usual, this is indicated to the customer via the dash panel insert.

Additional information can be retrieved via the "Car" menu, the MMI or the radio display.



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392\_135

Since time and mileage based service events are now indicated, process reliability is higher. This means that there is no danger of service events being missed without the customer receiving prior warning. The requirement for this is that the Service Interval Display is reset correctly.

## Maintenance table

	Audi A5 3.2l FSI	Audi S5 4.2l FSI quattro	Audi A5 2.7l TDI	Audi A5 3.0l TDI quattro
Engine oil change	flexible, 15000–30000 km/2 years			
Inspection	30000 km/3, 5, 7, ... years			
Pollen filter	30000 km/2 years			
Air filter	90000 km	90000 km	60000 km	60000 km
Spark plugs	90000 km	90000 km		
Fuel filter			60000 km	60000 km
Timing belt	Chain, lifetime			
Brake fluid	for the first time after 3 years (depending on market), then every 2 years (in accordance with the regular main inspection and emission test cycle)			



### Note

As a rule, the specifications given in the current service literature apply.



### Brake fluid

As can be seen from the maintenance table, the first brake fluid change interval has been extended. The first brake fluid change is now after three years, and thereafter every two years in conjunction with the main inspection and the emission test. This extended interval has been implemented in several markets for all Audi models from model year '07, i.e. at rollout of the TT and Q7. The combined main inspection/emission test interval applies only to Germany.

### Oil change

The oil change cycle has been reduced, because, unlike before, oil can be drawn off all engine types. It is therefore not necessary to remove the soundproofing. The soundproofing now only needs to be removed every 60000 km in order to check the drive shafts for example.

### Observance of maintenance intervals

The current maintenance intervals are based on extensive series of tests and fully utilise the lubricating ability of the engine oil for the specified period.

The tolerance limits set for the oil will be exceeded if the maintenance intervals are not observed. Excessive ageing can impair the lubricating ability of the engine oil, due to the accumulation of combustion wastes in the engine. This can lead to increased wear of engine parts which are dependent on lubrication (cylinder liners, piston rings, camshafts, tappets, chain drives etc.). The Mobility Guarantee does not cover engine damage caused in this manner.

## Audi Service Key

The ignition key of the new Audi A5 supports a new function known as "Audi Service Key".

This key supports service processes by saving a variety of vehicle data.

Actual vehicle information is written at pre-defined intervals to a rewritable memory chip integrated in the key.

This information can be read out by a special reader which is connected to the workshop computer via the USB port. The data read out can be displayed on a screen using software.

A facility has also been provided which allows various service systems (e.g. ELSA) to read in this data directly. Therefore, there is no need for the time-consuming and error-prone process of entering data manually.



392\_137

## Stored information

The following vehicle information is stored on the "Service Key":

- last-saved date and time
- mileage at last-saved date
- current service interval status
- transponder ID

## Reference

For further information about the Audi Service Key, please refer to SSP 393 "Audi A5 - Convenience Electronics and Driver Assist Systems".



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## Order acceptance

The service manager at the dealership reads the vehicle data out of the Audi Service Key and transfers this data to the ELSA system.

Based on the data which is transmitted, the service manager (in consultation with the Customer) decides what work is to be done on the vehicle.

The ELSA maintenance table represents the basis for this. The ELSA forecast states which work is next due. It is only recommended to bring forward service events if the next service event is due in less than 5000 km.

Checking the function of the front lights: side lights, dipped-beam headlights, main-beam headlights, fog light, indicator system, hazard warning light system	
Checking the function of the rear lights: brake light (also 3rd brake light), tail light, reversing light, rear fog light, license plate light, indicator system, hazard warning light system.	
Vehicle interior - glove box light, warning lamps, signal horn, MMI and luggage compartment light: check function	
Flexible oil service: reset	
Mileage based inspection: ALL due additional work is carried out.	Yes / No <input type="checkbox"/> Due at mileage (km) <input type="text"/>
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Time based inspection: enter actual date / due-on date.	ACTUAL <input type="text"/> Due on <input type="text"/>

The maintenance table is printed out by the service manager and represents the bill of work for the mechanic. The "Reset service display" item has been deleted from the maintenance table. For this purpose, a maximum of three lines (to be completed by the service manager) are displayed, specifying which data the mechanic must enter into the adaption channels on the Service Interval Display. The three lines of text are identical to the text displayed to the mechanic in the Guided Fault Finding or Guided Functions program.

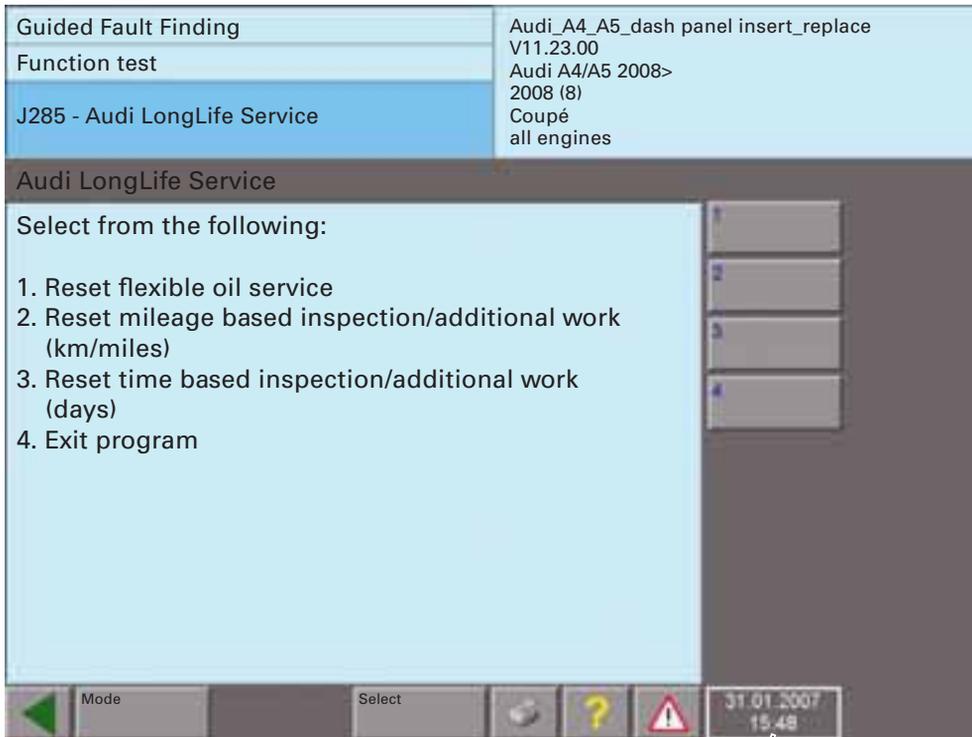
## Resetting the Service Interval Display

The Service Interval Display is reset in the Guided Fault Finding program or in the Guided Functions program on the diagnostic tester.

The test guides the mechanic through the program. An essential requirement here is the data to be entered into the maintenance table by the service manager.

A further requirement for correct setting of the Service Interval Display is that the correct date is set on the diagnostic tester. This date will in future be displayed on the tester user interface.

All changes to the service interval channels are archived in a history file in the dash panel insert. In this way, the customer can see when a service interval has been exceeded and the workshop can see when individual channels have been reset during a service event.



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392\_136

Date and time display

## Service schedule

The service schedule has been adapted to meet the new requirements. It serves only as **verification** of work one.

To find out what work is to be carried out, whether service events are to be combined and how the Service Interval Display is to be set, refer to **Maintenance Table in ELSA**.

The fields "Audi Inspection Service" are only to be completed when the vehicle is set to fixed maintenance intervals.

### Service records

<p><b>Audi LongLife Service</b></p> <p><input type="checkbox"/> Oil change</p> <p><input type="checkbox"/> Inspection</p>
---

<p><b>Audi Inspection Service</b></p> <p><input type="checkbox"/> Oil change</p> <p><input type="checkbox"/> Inspection</p>
---

<p><b>Additional work</b></p> <p><input type="checkbox"/> Brake fluid                      <input type="checkbox"/> Air filter</p> <p><input type="checkbox"/> Spark plugs                        <input type="checkbox"/> Fuel filter</p> <p><input type="checkbox"/> Dust and pollen filter            <input type="checkbox"/> Haldex: oil</p> <p><input type="checkbox"/> Multitronic: oil                    <input type="checkbox"/> S tronic: oil and filter</p> <p><input type="checkbox"/> Timing belt</p>
---

Mileage (km)	Invoice number
Mobility Guarantee until: Display <b>Service</b> max. km .....	
Date, stamp of Audi workshop	

### Service records

<p><b>Audi LongLife Service</b></p> <p><input type="checkbox"/> Oil change</p> <p><input type="checkbox"/> Inspection</p>
---

<p><b>Audi Inspection Service</b></p> <p><input type="checkbox"/> Oil change</p> <p><input type="checkbox"/> Inspection</p>
---

<p><b>Additional work</b></p> <p><input type="checkbox"/> Brake fluid                      <input type="checkbox"/> Air filter</p> <p><input type="checkbox"/> Spark plugs                        <input type="checkbox"/> Fuel filter</p> <p><input type="checkbox"/> Dust and pollen filter            <input type="checkbox"/> Haldex: oil</p> <p><input type="checkbox"/> Multitronic: oil                    <input type="checkbox"/> S tronic: oil and filter</p> <p><input type="checkbox"/> Timing belt</p>
---

Mileage (km)	Invoice number
Mobility Guarantee until: Display <b>Service</b> max. km .....	
Date, stamp of Audi workshop	

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# Diagnostics

To enable the VAS testers to carry out diagnostics on the Audi A5, they require the basic CD 11.XX and the relevant branded CD by Audi. This is because the data protocol (language) which several control units and the VAS tester use to interchange data has been modified.

The tester must therefore be capable of processing both the "old" data protocol, Key Word 2000, and the "new" data protocol, UDS<sup>1)</sup> with ASAM<sup>2)/</sup>ODX<sup>3)</sup>.

The change in the data protocol does not directly affect service personnel. The Guided Fault Finding and Guided Functions programs can be operated as before.

Again, data is exchanged between the vehicle and the testers via the diagnostics CAN bus. The voltage level and the transmission speeds on this CAN data bus are unchanged.

In the case of the Audi A5, for the first time, it is only possible to encode the control units with a tester which is connected online. Encoding is no longer possible without an active online connection.



392\_027



392\_028

- 1) **UDS** - Unified Diagnostic Services Protocol
- 2) **ASAM** - Association for Standardization of Automation and Measurement Systems  
ASAM has been a registered German association since 1998.
- 3) **ODX** - Open Diagnostic Data Exchange

# Self-study programmes relating to the Audi A5

The following self-study programmes have been prepared for the Audi A5:

- SSP 392 Audi A5
- SSP 393 Audi A5 - Convenience Electronics and Driver Assist Systems
- SSP 394 Audi A5 - Suspension
- SSP 395 Audi A5 - Networking



## SSP 392 Audi A5

- Bodyshell
- Occupant protection
- Engine
- Transmission
- Suspension
- Electrical system
- Infotainment
- Air conditioning
- Service
- Diagnosis

Order number: A07.5S00.34.20



## SSP 393 Audi A5 - Convenience Electronics and Driver Assist Systems

- Dash panel insert
- Door control unit
- Convenience system control unit
- Electronic ignition lock
- Audi Service Key

Order number: A07.5S00.35.20



## SSP 394 Audi A5 - Suspension

- Front axle
- Rear suspension
- Brake system
- Steering system

Order number: A07.5S00.36.20

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## SSP 395 Audi A5 - Networking

- Networking/topology
- Battery monitoring
- Onboard power supply control unit
- Outside lights

Order number: A07.5S00.37.20

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